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WHAT'S INSIDE

CableCARD Impact Felt By Cable Ops

Some companies are granted deferrals

by Sanjay Talwani

WASHINGTON

Another deadline came and went July 1 as the ban on integrated set-top boxes—those without a separable security system such as a CableCARD—went into effect. Scientific-Atlanta and Motorola say they are ready with the new boxes MSOs demand, and new entrants are poised with separable-security boxes they hope will replace some of the tens of millions of the doomed integrated boxes now in American homes.

Just two days before the ban, the FCC slowed the CableCARD era a bit more, giving many operators breathing room and creating some winners and some losers. Many smaller cable operators will benefit from the decision that allows systems committing to an all-digital lineup of services to continue using low-cost, low-featured boxes (without HDTV or DVR functions) such as the workhorse Motorola DCT-700. MSOs whose CableCARD orders are pending can apply for a deferral. And telcos like Verizon and Qwest, plus

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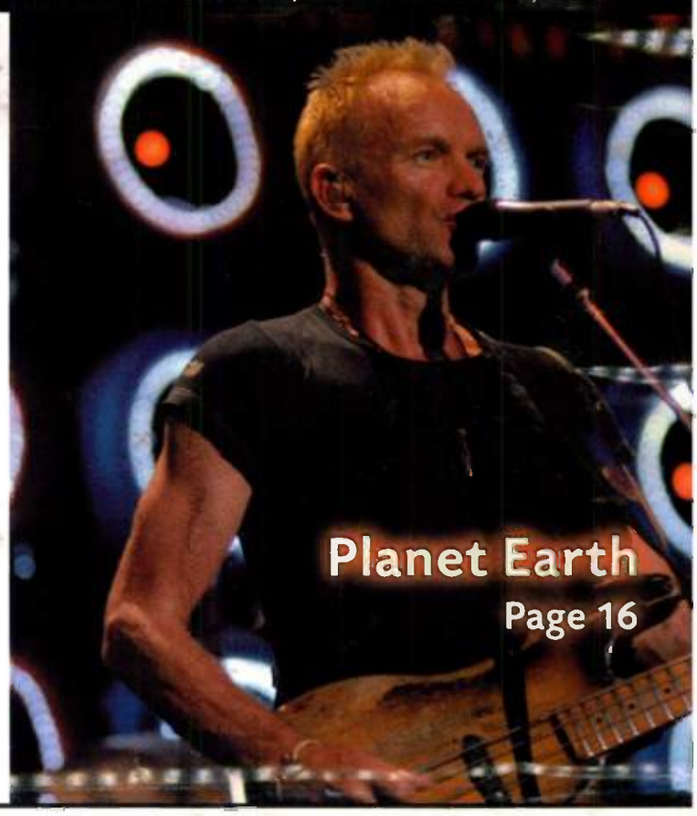

TitanCast Preps for Primetime

Broadcasters sign up to send signals via the Internet

by Howard Greenfield

NEW YORK

This month, TitanCast, a platform designed to carry broadcast signals on the Internet based on DMAs, is announcing the first several hundred members of its fledgling network.

Developed by Titan TV Media, a provider of software-based technologies for digital broadcasting, TitanCast provides a turnkey video distribution platform for local, syndicated, and user-generated content. Viewers can also search across content without leaving the station's branded player. They can even become part of the news team, submitting audience-generated content for stations to consider airing on the day's news play-out.

'JUST ANOTHER CABLE SYSTEM'

Because direct conversion of standard broadcast programming to Internet delivery exploits a long untapped place- and time-shifted PC and mobile device market, it is a competency coveted by more and more broadcasters.

"We need to have our broadcasting signals on the Internet," said James F. Goodmon, president and CEO of Capitol Broadcasting at the launch of TitanCast at NAB2007 in April. "I would even suggest the law is in place to do that right now. I don't know why anyone *wouldn't* like that. It's just another platform. The Internet to me is just another cable system."

By making it easy for affiliates to upload their video and have advertising supported through geographically targeted pre-roll ads and revenue sharing, the service is spawning a new kind of profit center.

TitanCast is built on a Flash video player that uses custom Action Script code integrating broadcast Web sites, content

TITANCAST, PAGE 14

Unlimited

sizing and repetition across all displays

Kaleido-X sets a new standard for signal flexibility among multi-room, multi-image processors. Any of its 96 inputs can be displayed, any number of times and at any size, over eight monitors without grouping restrictions. And the picture quality has to be seen to be believed.

www.miranda.com/KX

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Newsroom Technology

OK, I had to jump on the "everyone is talking about iPhone bandwagon" and at the same time explain how this relates to news technology. This is not a review of the iPhone and how it operates. It is a discussion of how the iPhone lets users get their content... p. 28

Frank Beacham

Net Soup

Thirty-five years ago, during the first portable video revolution, the definition of mobility was stretched to an absurd limit. Yes, compared to the huge broadcast remote vehicles of the 1960s, video crews in the '70s were light on their feet. That is, if light... p. 30

Karl Paulsen

Media Server Technology

The advent of solid-state, optical and magnetic spinning discs for the capture of field content is moving newsroom editorial functions into an improved, high-speed workflow that changes how news is prepared and multipurposed. Technologies... p. 36

FROM THE EDITOR

Power to the People

Did you see Live Earth last month? If so, you were one of the few (in America, at least).

Touted by organizer Al Gore as the world's largest one-day musical event ever, the Live Earth concerts, featuring more than 100 artists in 10 venues around the globe, were expected to reach several billion people worldwide, but only a small fraction actually tuned in.

In the United States, about 19 million watched the concerts on television, with a variety of NBC Universal-owned cable outlets from Bravo to CNBC collaborating on the day's coverage, concluding with a three-hour primetime special on NBC.

Ratings-wise, the numbers for the event to bring awareness to global warming were lukewarm at best; in fact, the evening show was the lowest-rated primetime program among the major networks, garnering only 2.7 million viewers. In terms of TV viewers, the BBC termed the event a "flop." The only bright spot seemed to be online where a reported record 9 million streams were generated.

Why didn't people tune in? It couldn't be for lack of talent, although some notables from past similar events, including Bruce Springsteen and U2, were noticeably absent. Although the televised coverage did not go off without a few hitches, most of the performances were well received by audiences both in the arenas and at home.

The most common complaint noted was that, in addition to the fact that Live Earth was the most politically controversial of these types of events, the environmental damage that accompanies gathering hundreds of thousands of music fans and flying in hundreds of musicians to arenas worldwide (not to mention the energy required to power the dozens of broadcast production trucks) outweighs the benefits of educating the public to the dangers of climate change.

Regardless of whether the concerts were deemed a "success" (however that's defined in this instance), the technical logistics of producing such an event for the TV cameras are significant. Check out our coverage on p. 16.

Tom Butts
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LETTERS

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

Bragging Rights

Dear Editor:

My interest in TV technology goes back decades, but never so much as for the five and a half years that I've owned my integrated HDTV with FireWire I/O.

Cincinnati is very conservative, which is the only reason I can muster as to why no local station has yet to do their news in HD. I say NBC deserves kudos far more than they do nasty, unconstructive criticism. One network, sooner or later, had to be first. With noise like we heard from Mike Jory, ("Big Deal," Letters, May 2, 2007), it's no wonder the newspapers, not even TV Guide, will yet publish HD schedules. Even though most of the locals here simulcast their standard definition programming on HD, one of the best, the PBS outlet, hardly ever does. You've got to tune in and hope or go get online to find out what's coming.

I praise the move to HD, and anything done to bring it closer to the public. For example, believe it or not, one national chain has recently been offering integrated 15- and 19-inch widescreens for as little as $180 and $219, respectively. These little boogers have so many features they can make your head spin. They can even be computer monitors. I know, they're not Runcos, but we should bear in mind Mario's latest rant on seeing and hearing ("TV Is Pictures and Sound; 'Taint Specs," The Masked Engineer, June 27, 2007). You get these inexpensive little wonders off by themselves, hook on an antenna, and, voila, it looks darn good and sounds good too, so it must be at least decent.

In short, it's high time manufacturers and broadcasters did some educating along the lines of HDTV. I teach a class at a local high school evening program three times a year. You work so hard in the industry, day in and day out, and would be amazed at the misinformation many of these poor souls have been fed for far too long by inept sales folks. The newspapers act like HDTV doesn't even exist, and yet it's everywhere in this large market... to be had for the connection of a simple antenna to a flat screen TV for less than $200 already.

Go for it NBC. Brag a little. Many of us are behind you all the way.

Jim Holt
Cincinnati

Dear Walter Schoenknecht:

Regarding your latest column, ("The Truck Gets in Your Blood," Inside Production, July 11, 2007); I can relate to all of that and more, since I not only started my career in studio, but have been on the production truck, and the transportable uplink. Now I am on the receiving end as transmissions supervisor for Fox Sports Net. I must say that my experiences have and continue to be helpful in gaining respect and admiration from all of the guys and gals who are still in the field. Without us nothing would hit air.

Ralph (J.J.) Bell
Houston

Walter responds:

I know there are plenty of people who start in one job and stay forever in that one job; I just can't imagine how they can do it. Sounds like you've seen it all, and that's got to be a benefit not only for you, but for anyone you work for... that's what experience means. And when you're on the phone with those guys in the field, trying to pull a bitstream or a carrier out of the clouds, you know exactly what they're going through on their end. No doubt that's what got you where you are today. Thanks for the kind words and for taking the time to send a note.

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SONY

"Because the F350 has time lapse, slow shutter and over and undercranking, I got more creative options and my client got higher production value for the budget," Humeau says.

"With XDCAM HD, we shot a big show on a tight budget."

Thierry Humeau, director of photography and president of Télécam Films recently used his PDW-F350 XDCAM HD camcorders to create *Bombs, Bullets & Fraud*, a documentary on the US Postal Service Inspectors for Smithsonian Networks, a new HD TV channel from Smithsonian Institution and Showtime Networks.

"They needed a big movie that had to meet their high standards of quality on a fairly tight budget," Humeau says. "Some scenes we shot movie-style with a big crew, dollies and jibs. Some are ENG-style, following cops at night. Some are highly produced interviews. In every instance, the XDCAM HD camcorder came through."

The show's producer, Tim Baney of Baney Media is also a fan. He says, "The camcorder is very producer-friendly. You can instantly play back a scene on the LCD monitor and say okay, good, let's move on to the next take. It's a huge time saver and safety net that gave me confidence, knowing we got it in the can."

And the Smithsonian Networks' reaction? "They love it," says Baney. "In fact, they're already talking to us about another film."

To see a trailer of *Bombs, Bullets & Fraud* and find out how to receive up to $500 back on the purchase of an XDCAM HD camcorder, visit sony.com/xdcam.

Smithsonian NETWORKS

Getting Sirius About Mobile Video

Satellite radiocaster launches Backseat TV

by Ken Freed

NEW YORK

Sirius Satellite Radio's new Backseat TV service will deliver three channels of children's television to video screens in 2008 Chrysler Group minivans and SUVs when it launches this month.

Sirius will provide digital satellite video services exclusively for the 2008 model year to Daimler Chrysler, starting with flat-screen displays on factory-installed DVD units in the Chrysler Town & Country and Dodge Grand Caravan minivans. Coming next for the 2008 models will be Sirius units installed in Dodge Charger, Dodge Magnum, Jeep Commander, and Jeep Grand Cherokee vehicles.

Nickelodeon, Disney Channel and the Cartoon Network are licensing their content to Sirius for Backseat TV. Other children's programming sources may be added in the future.

After the 2008 model year, Sirius Backseat TV may be available on other makes and models, depending on whether competitor XM Satellite radio strikes exclusive video deals with these other vehicle manufacturers.

Meanwhile, Doug Wilsterman, senior vice president and general manager for the OEM Division of Sirius Satellite Radio, said the Disney Channel will deliver its entire East Coast feed to Sirius Backseat TV, and the Cartoon Network will transmit their regularly scheduled programming to Backseat TV subscribers.

"Nickelodeon will transmit their regular daytime programming, but the Nick at Nite and Adult Swim content will be replaced by family entertainment."

Backseat TV subscribers must subscribe to Sirius Satellite Radio and the twin services will be bundled for a first-year fee of $470. The vehicle must be equipped with a rear seat entertainment system, and there's a separate price for the hardware. After the initial year, the subscription will be $7 a month.

Sirius hopes the offering will expand its subscriber base, which stood at 6.6 million at the end of Q1, representing a 66 percent share of the satellite radio market.

EXPANDING SERVICES

Wilsterman said the idea for Backseat TV "came from our simple desire to enhance our value proposition. We were trying to think of ways to expand on what we already have to create a more valuable offering to consumers."

Based in New York City's Rockefeller Center, Sirius today broadcasts more than 130 digital-quality audio channels, including 69 channels of commercial-free music, plus exclusive channels of sports, news, talk, entertainment, traffic, weather and data.

Sirius programming features shock jock Howard Stern, NASCAR racing, NFL football, plus audio feeds from CNBC, CNN, Martha Stewart, ABC News, BBC World Service, E! Entertainment, Maxim, NPR, and Radio Disney.

Sirius has deals with automotive partners that represent more than 40 percent of the annual new vehicle sales in the United States. Sirius radios are factory installed exclusively in Audi, Bentley, BMW, Chrysler, Dodge, Ford, Jaguar, Jeep, Kia, Land Rover, Lincoln, Mazda, Mercury, MINI, Maybach, Mitsubishi, Mercedes-Benz, Rolls-Royce, Subaru, Volkswagen and Volvo. Sirius radio is installed nonexclusively in Infiniti, Lexus, Nissan, Scion, and Toyota vehicles.

Sirius aftermarket satellite radio receivers are available at more than 25,000 U.S. retail locations, including Best Buy, Circuit City, Crutchfield, Costco, Target, Wal-Mart, Sam's Club and RadioShack. Sirius units also are sold at heavy truck dealers and truck stops nationwide.

"Since we're in the automotive business so deeply, we were intrigued by the idea of delivering video content by satellite to the millions of DVD displays installed in vehicles every year, both as OEM and aftermarket installations," Wilsterman said. "We announced that we could deliver video a few years ago through proof-of-concept demonstrations at CES. Chrysler jumped in with both feet, and everything came into place for launching the service this August in two of their 2008 model minivans with more of their 2008 vehicles to follow."

Wilsterman said the Chrysler Group has an exclusive deal only for the 2008 models. He declined to predict what's ahead for 2009, only saying, "No other manufacturers have been announced."

Chrysler is happy with the arrangement, said Michael Kane, advanced technology director for DaimlerChrysler in Detroit.

"We get to be the first to market with this new subscription service for families that offers all of the top 100 shows watched by children ages 2 to 17," Kane said. "This continues our leadership in the minivan segment. Offering factory-installed Backseat TV should help us sell a few more vehicles and make a little more money."

Toward that goal, Kane said that after the Chrysler Town & Country and Dodge Grand Caravan, Backseat TV may be made available on the Chrysler Aspen and Dodge Durango, which are slated to have gas-electric hybrid versions. "It's too soon to talk about our plans,' he cautioned. "We'll probably know more by October or November."

Sirius Satellite Radio's Backseat TV will first be offered exclusively to 2008 model year DaimlerChrysler vehicles.

Kane explained that Backseat TV will expand on the MyGig DVD and MP3 system installed in select Chrysler Group minivans, which already contain multiple screens in the front and back of the vehicle. For safety, he said, the driver's DVD screen only functions when the vehicle is in park, "and that's perfect for the parent who wants to watch a movie or listen to their favorite music while waiting for a child to finish soccer practice."

Wilsterman said he could not reveal proprietary technical details of the system, but he did provide a general overview.

"The identical infrastructure used for Sirius Radio is used for Backseat TV," he said. The satellite video signal will be received through a small two-inch antenna atop the vehicle that matches the existing Sirius audio antenna. In densely populated urban areas, the two antennas will pick up the Sirius signal from local repeaters.

SAME PROCESS AS AUDIO

Within the vehicle, a Backseat TV black box is installed next to the Sirius Radio black box. Inside the Backseat TV black box, a chipset receives the baseband video signal and passes it through a decoder. This is the same process for audio but kept separate.

The Backseat TV black box is hardwired into the DVD players that connect to the flat-panel screens. Headphones let rearseat passengers enjoy programs without disturbing the driver. Wilsterman said the Chrysler vehicles will have two screens in the back facing the second and third row, and in some cases a screen up front. "You can not watch two different channels at the same time, although the front driver and passenger can listen to Sirius audio while the kids in the back watch Backseat TV."

Kane said that by using the touchscreen control in the front of the vehicle, the driver can select between DVD, MP3, Sirius Radio, or Sirius Backseat TV. He added that the second row of seats can be reversed so it faces the third row, which is good for kids playing games on long trips.

"The first generation of Backseat TV will only have thee channels for Nickelodeon, the Disney Channel and Cartoon Network," Kane said, but offered that next iteration would provide more.

As a glimpse ahead, Kane pointed to Samsung's initiative for mobile reception of ATSC broadcasts; as well as Qualcomm's MediaFLO MDS video reception system, which is offered by Verizon. "We think that when it comes to media, the vehicle, over time, will become just another room in the house, except for all the driver safety provisions, of course."

And what about the XM Satellite service? And what effect will the proposed merger between the two satellite radio companies have on Backseat TV?

"Both Sirius and XM made announcements at CES for the past few years about in-car video," said Jimmy Schaeffler, chairman and senior research analyst at the Carmel Group in Carmel, Calif. "Sirius CEO Mel Karmazin made a really big deal about it, and I remember that XM CEO Hugh Panero was chafing at the fact Sirius had come up with pretty much the same plan and made the same announcement in the same time frame."

While it's possible that XM is negotiating deals with Ford and GM for a satellite video service, Schaeffler said it's too late in the cycle to expect XM to announce anything for the 2008 model year. "If and when XM does make such an announcement, some of the luster will come off the Sirius apple, but not all."

In fact, Schaeffler added, "this is a perfect example of why the merger of Sirius and XM should not go through. Why would Sirius rush to get this service to market if they had a monopoly? Besides, if this new service puts more money in their pocket, it would pull them back from collapse, which will erase the need to merge with XM in the first place. Actually, a merger would be to their disadvantage, since this move clearly puts them ahead."

The technology behind Sirius Backseat TV is "impressive," Schaeffler concluded, "and as a father, I can see how parents will absolutely adore this new service, especially on long trips. They may have a winner here." ■

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Leading With Weather

Severe weather updates are priority for local news

by Claudia Kienzle

HAMILTON, N.J.

Ask any broadcaster about the importance of their live weather reports, and they'll often say that weather drives the ratings for their local newscasts; and ultimately their standings in their market.

While weather is tied to the bottom line, many news directors and station meteorologists also point out that they are providing a valuable community service—warning the public of life-threatening danger and property damage.

At Chicago's Fox affiliate, WFLD-TV, the millions the station has invested in acquiring the best weather talent and technology have paid off in saving lives and property, while boosting ratings.

> "We always do our own forecasting. This is an increasingly competitive weather market."
> —Gary Lezak, KSHB-TV

SAVING LIVES

WFLD's new 10 p.m. "The Ten" newscast, which launched in April, has already beaten established network O & O competitors in the Adults 18-49 demo, and weather has played a significant factor in that win.

"You can talk about how good weather reporting will increase ratings, and help the station build its brand. But when you get right down to it, this is a way to save lives," said Andrew Finlayson, vice president and news director for WFLD.

Recently, after WFLD installed the Guardian megawatt dual polarization radar system from Baron Services, known on air as "Live Power Doppler," one of WFLD's meteorologists warned viewers of a small tornado before it had been spotted, or reported by the NWS, and even urged people on a particular Chicago street to seek shelter immediately.

"Sure enough, the next morning, we were on that street with our live trucks, unfortunately covering the death of child," Finlayson said. "The house had partially collapsed as a result of the winds. The family hadn't been able to see our broadcast because they had lost power. But we probably saved other lives on that street that day. That's the value of this radar technology."

According to Bob Baron, president and chief executive officer of Baron Services, in Huntsville, Ala., "Our megawatt radar allows station meteorologists to punch through storms, and analyze them in 256 colors and great detail. The radar can rotate at speeds up to 6 RPMs, delivering a new storm sweep every 10 seconds. These combined features help the station's weather team relate life-saving information with promptness and accuracy."

WFLD also uses Baron Services' VIPIR, a complete weather system that integrates 3D radar display and real-time graphics, throughout its news operation, which includes news during the morning show from 5 a.m. to 9 a.m., the noon and 9 p.m. newscasts, and *www.foxweatherwatch.com*.

TORNADO ALLEY

KSHB-TV often leads off its NBC Action News with breaking weather. Based in Kansas City, Mo., KSHB-TV has provided extensive coverage of severe thunderstorms, floods, and a tornado, all of which impacted its coverage area in the last few months.

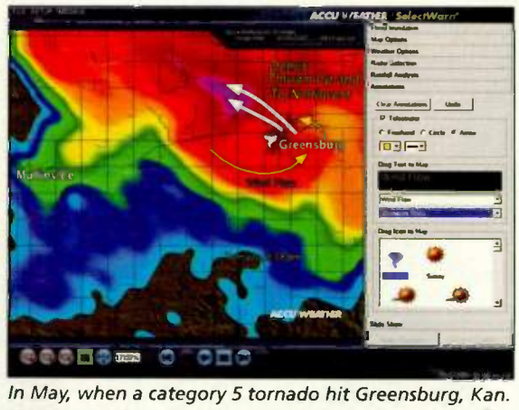
Besides local HDTV newscasts at 5 p.m., 6 p.m., and 10 p.m., and a morning and weekend show, KSHB also offers a 24-hour weather channel called NBC Action. KSHB often simulcasts its live on-air coverage on the channel, which is produced by NBC in association with over 90 NBC affiliates nationwide, and widely carried by local cable systems.

"If there are severe winds or if a thunderstorm is brewing, especially since we're located in tornado alley, it leads the newscast. When tornado sirens are going off in our viewing area, we can go live for four or five straight hours monitoring the situation, and that's quite challenging," said Gary Lezak, chief meteorologist for KSHB-TV. "We take data from many weather sources. But, we always do our own forecasting. This is an increasingly competitive weather market."

KSHB uses technology from Weather Central, including ESP:LIVE, which the station refers to on air as Early Storm Prediction because it shows viewers where tornados could be occurring, where lightning could strike, where hurricanes may be forming, and other weather situations that could impact the coverage area.

According to Steve Smedberg, director of marketing and product management for Weather Central Inc., in Madison, Wis., "ESP:LIVE has algorithms running in the background that analyze current radar and storm characteristics and compare it to thousands of storms previously analyzed. It rates the probability that a storm will develop into a severe weather event.

"With this tool, broadcasters say they are often telling viewers about the potential for a tornado before the NWS has issued a tornado warning," Smedberg said. A version of ESP:LIVE is used by NBC Weather Plus.



In May, when a category 5 tornado hit Greensburg, Kan. KWSH used this image from AccuWeather's Selectwarn system to show the moment that the tornado was moving through the town. The purple area to the northwest of the town is the actual radar echo of debris picked up by the storm.

DRAMATIZED WEATHER

KWCH-TV, the CBS affiliate in Wichita, covers 75 counties in Kansas, as well as several counties in northern Oklahoma, southeast Nebraska, and eastern Colorado.

When severe weather hit on May 4, 2007, KWCH's meteorologists, including Chief Meteorologist Merril Teller, went live with weather coverage for 21 straight hours, without commercial interruption, to cover the impact of an EF-5 tornado (with 200-234 mph winds) that devastated Greensburg and other Kansas towns.

KWCH also provided coverage of the recent flooding in Kansas. For both weather stories, KWCH used AccuWeather's SelectWarn, an on-air radar display system that provides detailed street-level radar and displays snow depths, ice thickness, hail, high winds and other hazardous conditions. They also used Storm Hawk, a live, bidirectional reporting system that allows field crews to remotely view a storm's path and place themselves in position to deliver live reports ahead of the competition.

According to Dr. R. Lee Rainey, vice president of marketing for AccuWeather, Inc., in State College, Pa., "Reporters can position themselves near tornados, flooded areas, or other newsworthy visuals, capture the pictures, and send them in real time to SelectWarn. SelectWarn automatically plots that location on a map, and does an inset to show the pictures coming back from Storm Hawk. It also helps crews stay safe, such as determining when to put up the satellite dish, which could be a potential lightning rod."

At NAB2007, AccuWeather also introduced CinemaLive HD, a next-generation system that just entered betatesting. CinemaLive HD offers cinema quality 3D, HD, and virtual set and video wall capabilities. Besides the latest meteorological tools, it integrates the real-time graphics rendering engine from Brainstorm Multimedia, a virtual set vendor based in Madrid, Spain.

"CinemaLive HD allows weather presenters to combine 3D models with high-resolution aerials and fly-throughs of downtown, and show virtual rain and other effects designed to dramatize the weather forecast in HD," Rainey said.

THREAT ANALYSIS

At WTVF-TV, a Nashville-based station serving parts of Tennessee and Kentucky, there are four meteorologists on staff, and a network of eight computers dedicated to WSI weather data analysis and HDTV presentation tools.

"Early warnings save lives and property. When severe weather conditions arise, we often break into programming with regular updates, run crawls, and occasionally go on with live coverage for the duration of the weather emergency," said Ron Howes, chief meteorologist for WTVF-TV.

WTVF's four county coverage area is prone to tornados, hurricanes, ice storms, flash flooding, and damaging winds.

"We first evaluate all of the weather data we have to gain a clear idea of rapidly changing weather conditions," Howe said. "Without that situational awareness, it's difficult to warn the public about what is likely to happen, and what the impact of the storm is likely to be."

WEATHER, PAGE 17

Solutions to match budgets and needs

AEROMAX: The next generation of audio processing for TV

The Linear Acoustic Legacy: three unique solutions for broadcast sound.

SD/Analog Television: AEROMAX-TV™ Stereo TV Audio Processor

A dynamics unit for two-channel main plus SAP audio, or four mono channels of audio, AEROMAX-TV features CrowdControl™ Dialog Protection Processing to eliminate the "missing announcer" problem for stereo viewers prior to transmission without impacting sound quality for surround listeners.

Basic Surround Sound: AEROMAX-DTV™ Six-Channel TV Audio Processor

A fully integrated, entry-level unit for controlling loudness and ensuring stable audio imaging for 5.1-channel broadcasts, AEROMAX-DTV is based on the success of our original OCTiMAX 5.1. The unit combines air-proven dynamics processing to control program loudness with Hollywood-approved stereo-to-5.1 surround sound upmixing.

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Anytime, Anywhere

Yankee Group discusses the new revolution

by Robin Berger

LOS ANGELES

After 37 years, the Yankee Group research firm has redefined its mission: Henceforth, it will uncover the possibilities and pitfalls of what it calls "The Anytime Network."

In recent years, the Boston-based tech research firm had targeted broad technology issues across corporate IT organizations, according to Emily Green, president and CEO of the Yankee Group. But the company recently revised its mission because "it's more valuable for our clients for Yankee Group to focus exclusively on the impact of connectivity change," Green said.

The Yankee Group defines the Anytime Network as "a seamless and always-accessible intelligent infrastructure that provides a connection for everyone to everything from anywhere."

LANDLINES GOING AWAY?

Reports of half a billion mobile phones in China and indications that fixed-mobile telephony revenue is starting to outdistance traditional service elsewhere were only two items in a laundry list of factors that convinced Yankee Group CEO Emily Green, "this is a revolution." And she noted, like all revolutions, there will be changes in the power structure, at least in terms of "business models, laws and social norms."

Of course with chaos comes opportunity. The Yankee Group will be "the experts in navigating the global connectivity revolution," said Green.

Not content to limit publicity to high-tech options, the company has taken its message on the road, speaking to groups in 10 cities around the globe, including Orlando, Fla., Beijing, New Delhi, Hong Kong, New York City, London, San Francisco, Los Angeles and Boston.

To date there are more questions than answers. As Green noted, "sixty percent of the world has yet to make a phone call," due to the expenses of setting up an infrastructure (though, thanks to cheaper mobile alternatives that, too is changing).

But the Yankee Group believes that a new breed of consumers is already in the making, folks who want "to take their experiences wherever they go," said Green. As such, it would benefit businesses to know 1) what consumers want; 2) who is likely to give them what they want; 3) what they would be willing to pay for services, and 4) how brands will reach them.

According to Green, the Yankee Group intends to prove their thesis about the Anywhere Customer by tracking consumers that carry devices, use broadband networks, take their experiences with them, define their own communities, and prefer to be identified by activities not technologies.

Yankee Group CEO Emily Green

"The revolution that's ahead of us will dramatically change the roles of network operators and the rights and economics of content."

—Emily Green, Yankee Group

They have already begun, surveying U.S. teenagers about what they would prefer to watch on mobile devices. Contrary to previous analyses, top scores went to full-length movies (45 percent) and television shows (40 percent). Made for mobile content like "Mobisodes" got a nod from 14 percent.

Other targets for study will be "Anywhere Enterprise" employees, customers, assets and partners connected to applications, information and services, where and when they're needed, said Green.

"The [Anywhere] network is not going to be a dumb pipe," she said, there will be "intelligence to deliver services."

This premise leads to the following questions that the Yankee Group will also tackle: Who will deliver the pipe? What will it do? What will it cost? What's the economic model?

"The revolution that's ahead of us will dramatically change the roles of network operators and the rights and economics of content," said Green.

CREATIVE DESTRUCTION

According to an Executive Summary published by the Yankee Group, "traditional business models are being severely disrupted as new innovations emerge and take advantage of the low-market entry barriers created with Internet Protocol, MPEG and internet browser technology."

The antidote is "a framework for navigating the developing chaos and profitably delivering services to the Anywhere Consumer and Anywhere Enterprise," according to the summary.

Boyd Peterson, senior vice president, consumer research, and Michael Goodman, director of digital entertainment, came to the Los Angeles event to explain this "creative destruction." Their first attempt was a quote from Joseph Schumpeter, who wrote "Capitalism, Socialism and Democracy" in 1942.

The second attempt, comparing consumer choice to the game "Marry-Kill-Sleep With," drew a heartier response from the audience.

"As a movie studio, you'd want to kill Apple," said Peterson, adding that would also be the choice of the media and communications industry at large, given that the iPhone foretells the obsolescence of traditional consumer products. "But, as a consumer, I love Apple."

Peterson said that the iPhone's greatest accomplishment was its ability to provide the appropriate technology and network for the task at hand.

Goodman noted that innovators like Apple were "creating an on-demand response," a behavior which is increasingly making the current linear business model for entertainment less and less applicable to its audience. He noted that consumers want to buy songs, not CDs. Forget about prime time.

And as the audience turns off to the package, creators are seeking alternative ways to directly appeal to consumers, Goodman said, citing a deal between filmmakers the Coen Brothers and 60 Frames to to make Web videos. 60 Frames is a start-up formed by United Talent Agency and Internet-based advertising agency Spot Runner, with backing from co-founder Robert Pitman, Tudor Investment and the Pilot Group.

Peterson and Goodman advised the following five steps for success in the Anywhere universe:

- Become more customer-focused
- Abandon DRM or digital rights management, (specifically the ban on content for use on multiple devices) and embrace watermarking;
- Provide quality file-sharing services;
- Break the barrier between devices (develop interoperability), and
- Provide value to content creators. ■

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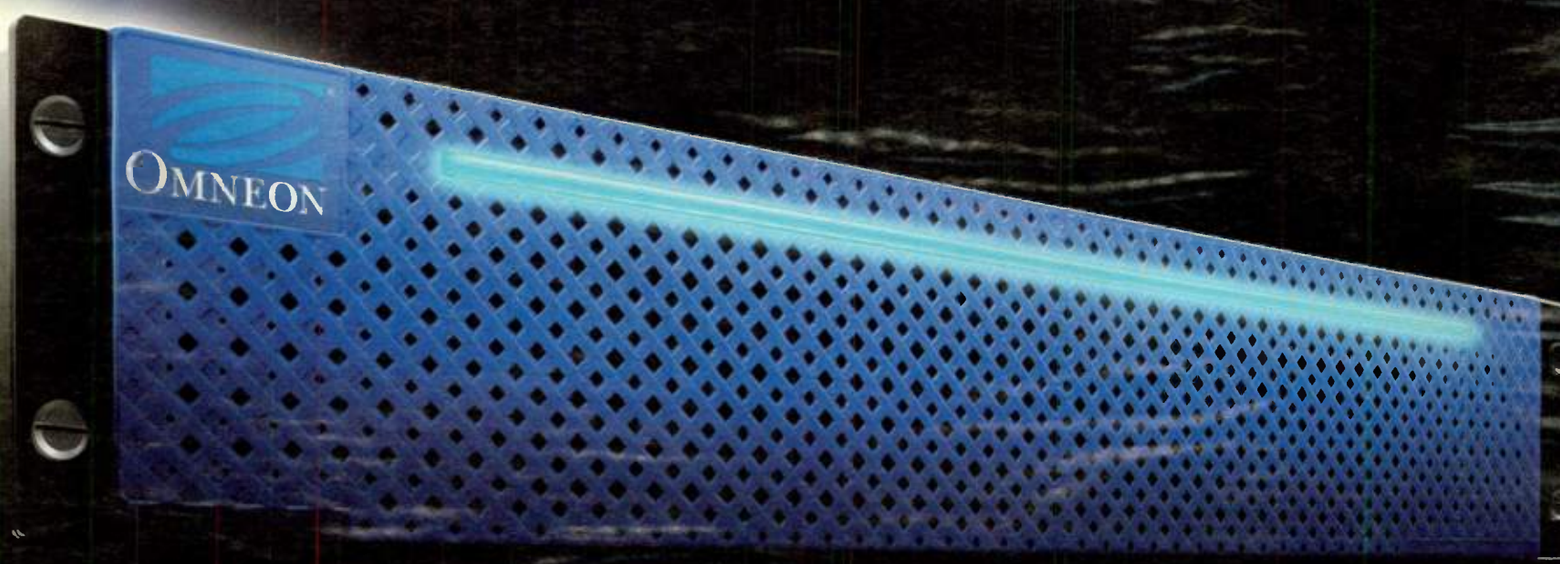

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CableCARD

CONTINUED FROM PAGE 1

many new entrants who use IP and other nontraditional systems, won a big break with a one-year extension.

Among the losers are the big cable companies, for whom the National Cable and Telecommunications Association sought, but were denied an industry-wide waiver.

"It's certainly unjustified in terms of giving the waivers, even a one-year waiver, to companies who purportedly use a different technology, who should have been able to anticipate the separable-security rules that were staring them in the face when they decided to get into the cable business," said Neal Goldberg, NCTA's general counsel, speaking of the big telcos. He plans to appeal the denial to the full commission.

Large cable operators say they have massive architectures to contend with, along with customers who are happy with analog tiers and no set-top boxes. The NCTA has argued that the separable-security mandate—a ruling nearly a decade old, and one which the industry came up with in the first place—is a counter-productive diversion of resources from the industry's greater goal of a Downloadable Conditional Access System.

Comcast is livid with the FCC, where for more than a year it has sought a waiver, at least for its low-cost boxes. The company told the FCC that giving Verizon a waiver for all boxes—advanced and basic—while denying any waiver for Comcast (which has, in fact, taken steps to deploy compliant boxes) is arbitrary, capricious and "raises serious questions about the integrity of the waiver process." What's more, Comcast says, Verizon's claim that no non-integrated HD or DVR boxes exist for its technology is "preposterous."

NO IMPROVEMENT

Despite the administrative setback, the big cablers say they have been preparing for the deadline and are deploying the new boxes. Ultimately, millions of CableCARD boxes will reach American homes. Operators say the transition will be almost invisible to viewers, although they'll be a cost—some $600 million in higher box prices, the industry says—with no improvement in services and a diversion of resources that could be used to develop DCAS.

To avoid having to send old integrated boxes to the landfill, companies may continue to use previously deployed boxes (though some were blindsided by a June 29 FCC ruling that refurbished devices are considered "new" devices and thus subject to the ban.) And some companies have offered special incentives, such as very inexpensive rentals, to encourage people to use or keep older digital boxes.

As for the June 29 Media Bureau denial of the industry-wide waiver requested by NCTA, Time Warner Cable, like most companies other than Comcast, seemed unfazed.

"So far, so good, as far as performing as expected," TWC spokesman Alex Dudley said of the new boxes, which the company started deploying well before the deadline.

Some companies appear to have fallen through cracks in the FCC process, at least for a short time. Although the FCC promised to grant temporary deferrals to small operators that have ordered, but not received CableCARD devices, there are approximately 10 companies whose requests for such deferrals remain pending, according to a person familiar with the process.

One of these, WEHCO, a small, rural cabler headquartered in Little Rock, Ark., has been told by its supplier not to expect to receive CableCARD boxes until at least October. In its request for deferral, WEHCO told the FCC that it's had to refuse customer orders for new boxes and even to cancel pending orders. At press time, the deferral had not been granted.

BEST OF 2003

The intentions were to promote competition in cable boxes, possibly by allowing customers to make choices from a wide variety of cutting edge technology products, just as cable customers in other countries do. But some figure that developing CableCARDs is not the straightest path.

"It's an outdated technology with no additional functionality for leased boxes, and that's why downloadable security is the next technology on the horizon," said Goldberg. The cable industry says it has spent $30 million and committed $100 million toward developing DCAS.

"If I had my druthers about it, I would have not liked to utilize a lot of resources to develop the CableCARD," said Dave Clark, director of Product Strategy and Management at Scientific-Atlanta, which reports that it's filling all its orders with no problems. "DCAS is a cleaner solution. And it's clearly a lower-cost solution, but it's just not there yet."

Comcast is livid with the FCC, where for more than a year it has sought a waiver, at least for its low-cost boxes.

The Scientific 4250HDC is one of the new breed of set-top boxes incorporating the CableCARD security system.

Clark foresees trials in 2008, but warns it's not simple. The various cable operators have to be involved, along with third-party technology companies as well as content owners who have concerns about protection.

Richard Doherty, an analyst with Envisioneering, a Seaford, N.Y.-based research outfit, said the FCC action—and the cable industry's resistance to removing its old boxes—are almost guaranteed to bring more business to the telcos, with their promise of advanced new features.

Cable companies have dropped the ball on consumer choice, Doherty said, offering only limited lines of boxes, while systems abroad, not to mention cell phone providers and computer makers, roar ahead.

The lifespan of a digital box is typically some eight years, he said.

"A cable digital box at the present gives you the best technology of 2002 or 2003," Doherty said. "You want a guide [electronic program] that will scroll down before you go on Social Security." ■

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Reasonable prices, priceless reasoning.

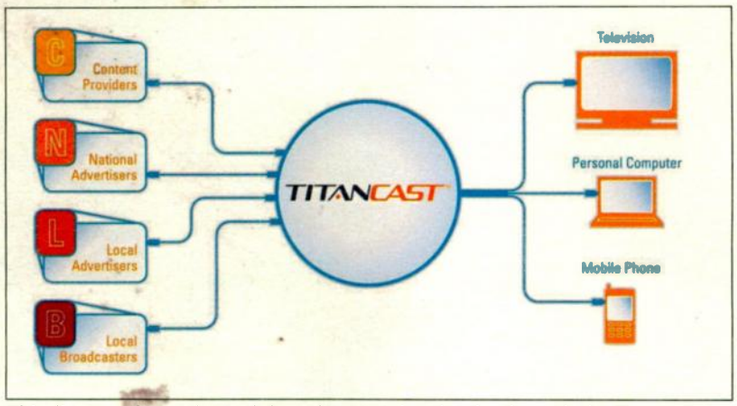
TitanCast

CONTINUED FROM PAGE 1

and video advertising. It provides media management tools for syndicating video to other members of the TitanCast Network, matching advertising to the user's geographical location. Based largely on Microsoft ASP.NET 2.0 (C#), running on Windows Server 2003, the TitanCast Player site customizes Web pages with Flash components and server functionality for authorization and metrics collection. Video and advertising are delivered by a Vital Stream Content Delivery Network (all video delivery is done via streaming in version 1.0). The back-end contains Web services for ad selection, metrics and authorization as well as secure streaming.

By joining the TitanCast network—a group of broadcasters, content owners and advertisers—viewers are now being connected in real-time over the Web via the TitanCast Player, enabling a new model of advertising revenue and content distribution.

TV, user-generated content, and other video-centric applications already comprise more than half of all Internet traffic, with that percentage expected to spike higher and higher in the next few years according to experts. All that traffic means the playing field is tilting in favor of providers who best diversify their content and platform to suit new personalized, interactive preferences of an emerging Web 2.0 and Television 2.0 audience.



This diagram shows the path broadcasters' signals take through the Titancast architecture.

"More and more stations are saying 'how can I get into this whole MySpace, YouTube, user-generated space," said Jack Perry, founder and CEO of TitanTV Media.

TitanCast spent about eight months embedding automated uploading, transcoding, hosting, and streaming into their new offering. Perry stresses simplicity.

"Stations or viewers upload content and they're done," he said. "We've totally automated it for WRAL so that at the end of the day the content just flows into the TC network. It's no extra work. And that's the way I think it will be for all stations down the road."

According to Perry, customers will "re-capture viewers in a time slot they were never able to control: the 9 a.m. to 5 p.m. slot." Viewers "may spend 30 to 45 minutes within the KZEW or KCRG brand" as refreshed content makes their Web properties more sticky and "trains viewers to come online and stay online." Perry expects the network to grow to 1,000 stations.

CHANGING TIMES

Must television become cross-platform to survive? One Midwestern station group, which has already signed on to TitanCast, says yes.

With television and radio increasingly in the information business, "if you don't pay attention, you're going to be sorry about it down the road," said Elizabeth Murphy Burns, president of Duluth, Minn.-based Morgan Murphy Media, which owns and operates television and radio broadcast properties in Wisconsin and Washington. "Advertising is changing. Product placement, banners, trying different things on different platforms;" the end result, she believes, will be a combination of what everyone in the industry observes in what everyone else does about this, "state by state, region by region."

Just as it has become easy for mom and pop video producers to air their video online, it's becoming just as easy for *advertisers* to select or opt-in for advertising-based monetization, according to broadband advertising innovator Jayant Kadambi, CEO of YuMe, a Redwood City, Calif.-based company that has developed a dedicated broadband video advertising network.

"There are lots of people trying to figure out how to allow the little, medium, or regional [i.e, the local pizza store] businesses to advertise easily in the video domain," he said.

TitanCast pays off by "taking our programming and keeping it local—letting people take it on road with them, like SlingBox," Burns said. "For instance, when you're traveling in Las Vegas, you get local programming from home (which could be L.A. Dubuque, La Crosse, or Houston) with *Vegas commercials*. It opens up another advertising road! This additional national umbrella is very appealing."

TitanCast offers stations a scalable solution not available anywhere else, says James F. Goodmon Jr., vice president and general manager of CBC New Media Group in Raleigh, N.C. Stations can receive revenues from ads sold around content that is displayed even on another broadcaster's Website. Most importantly, they can now sell advertising on content viewed by people within their DMA, watching on a Website *outside* that DMA.

"Not only are we able to attract more people to the site," says Goodmon Jr, "but given the new content and user interface, our visitors are looking at more content and spending more time online with us than ever before. We are now exceeding a million video views a month" doubling last year's Web traffic.

THE FINAL FRONTIER

In the past, Titancast's original Air-to-Web Broadcast Replication (AWBR) patent and others pointed the way to today's innovations. But there's more to the picture here than meets the eye—more than just content and technology.

What seemed at the time like a straightforward bridge from broadcast signal to online access has reached a twist in the road: intellectual property issues. To obviate this snag, Capitol Broadcasting is asking the U.S. Copyright Office to extend or recommend an amendment by Congress for compulsory copyright license to "in-market retransmission of TV signals." Such a license would only be available to companies complying with cable systems rules and regulations that restrict Web retransmissions to TV stations' over-the-air markets, according to Capitol. "Broadcasters need to have their signals available on all of the distribution platforms" Capitol CEO Goodmon said.

With the technical and commercial hurdles overcome, the competition is heating up for the best implementations of cross-platform news delivery. But, it poses another question: Can government keep pace with advances in this new generation of content distribution? Time will tell, but TitanCast has let the cat out of the bag. ■

Howard Greenfield is an industry strategist, columnist and president of Go Associates and principal of Go Associates.

Closed Captioning for DTV

Opportunities abound, once broadcasters understand the potential

by Craig Johnston

SEATTLE

Closed captioning for NTSC became a mature and reliable technology serving the deaf and hard of hearing community over nearly three decades, but the ATSC signal for DTV has ushered in a new closed-captioning technology, along with a new shakeout process.

Early reports have DTV captions working reliably one day, then disappearing the next, or captions running off the right side of the screen. As it was with analog captions during their introductory phase, the problems can be with source material, with the broadcaster's signal chain, with a cable or satellite system's delivery process, or with the viewer's own receiver or decoder box.

DIFFERENT FROM ANALOG

According to closed caption technology suppliers, DTV captioning will also become a reliable and regular part of television once its understood and properly monitored.

Captioning for DTV is different from its analog predecessor in three basic ways:

In the digital channel the captioned material does not reside in the vertical blanking interval (VBI) as it did in NTSC, but instead in the DTV closed caption (DTVCC) transport channel part of the DTV signal's user data bits segment.

Closed captions to be viewed on a DTV receiver reside in the DTVCC caption channel within the transport channel, and must be encoded to the EIA-708-B standard, described later in this article (see Fig. 1).

Closed captions to be viewed on an NTSC analog television receiving the DTV signal through a converter box must reside in a separate channel within the transport channel, and must be encoded in accordance with the EIA-608-A standard, which is currently used for captioning for analog broadcasts.

One reason a new captioning standard was required for DTV is the various formats within the DTV standard, according to Bob Henson, CEO of Link Electronics, a Cape Girardeau, Mo.-based provider of closed captioning technology.

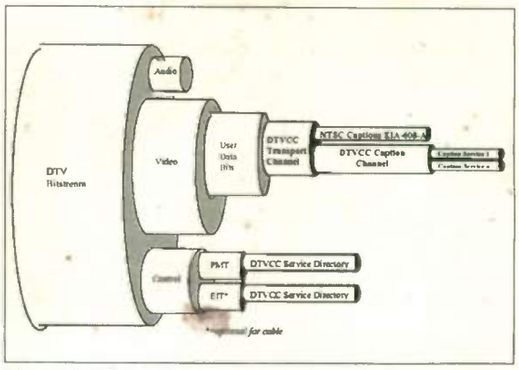


Fig. 1: DTVCC caption data in the DTV bitstream. Diagram courtesy EIA

"A big challenge is keeping up with all the formats that are out there, 1080i, 720p, and the variations within them," Henson said.

This has required companies making DTV closed caption encoders to built in the agility to work within different resolutions, interlace and progressive scans, and frame rates.

Captions for NTSC (EIA-608-A) are basically black and white (some color possible) text with bold, italic and underline control, that pop on or roll up the screen. The EIA-708-B standard for DTV allows greater flexibility for the caption author and for the viewer. (Viewer option requirements for DTV receivers or tuners are listed in a sidebar.) Among the caption author's 708 options are:

- An enhanced character set with more accented letters and non-English letters, and more special symbols;
- Viewer-adjustable text size, allowing

CAPTIONING, PAGE 26

Live Earth Concert Reaches Out in HD

High-definition content production spans six continents

by Craig Johnston

WASHINGTON

The Live Earth internationally televised concert event was truly worldwide, utilizing high-definition video from 10 venues spanning six continents, plus a garage band of polar scientists who shipped an HD tape of their performance off Antarctica for inclusion in the 24-hour Live Earth world feed.

"This was kind of unprecedented," said Andre Mika, Live Earth executive in charge of production, "in that we actually produced in HD in countries that don't even broadcast high definition yet."

ACCOMODATING FORMATS

The world feed was distributed in multiple frame rates in high definition, as well as standard definition PAL and NTSC formats to match the broadcast infrastructures of countries around the world demand.

Where its 2005 predecessor, Live 8, came together in fits and starts, Live Earth's venues in New Jersey; London; Tokyo; Hamburg, Germany; Johannesburg, South Africa; Rio de Janeiro, Brazil; Shanghai, China; and Sydney, Australia; were set months ahead of time. (The only last minute adjustments were feeds from Washington, D.C. and Kyoto, Japan.)

That amount of lead time was necessary. Mika, who directed the 2004 Athens Olympics in HD for NBC, called the Live Earth production "the biggest Rubik's cube I've ever seen." He noted that at least the multiple venues of the Olympics are situated surrounding a single city. "This was a much bigger bear. The variables were much harder."

First of all, they needed a truly international broadcast center for a base of operations. Another factor also had to be considered. While the United States and a few other countries originate and distribute at a 29.97 or 30 fps rate, most of the world runs its SD and HD acquisition and distribution at 25 fps.

NBC Photo: Ali Paige Goldstein

Sting from the Police entertains as part of the Live Earth HD global broadcast on July 7.

MAKING IT ALL WORK

It was almost a forgone conclusion that the BBC in London, with its massive 25 fps infrastructure, would be home base. But how to get feeds from around the world into the BBC in the proper format, and then deliver them back around the world?

To use a musical metaphor, courtesy of the Beatles, Live Earth was able to pull it off with "a little help from its friends."

One of those was Intelsat, the commercial global satellite communications company. "With 52 satellites, seven teleports and lots of fiber, you can do a lot of things these days," said Mike DeMarco, Intelsat vice president for video services.

Utilizing their array of satellites and teleports, Intelsat can transport video between any two places on earth with a maximum of two satellite hops. For instance, feeds from the event's concerts in the Pacific Ocean Region, in Sydney, Tokyo and Shanghai were bounced off a satellite over the Pacific Ocean, down to a teleport in Napa, Calif.

Those audio-video signals were transported across the country via fiber optics to another teleport in Atlanta, where they were uplinked to a satellite over the Atlantic, which then transported them to the BBC in London.

Ignoring the various BBC production processes, the world feed video and other video packages were returned in HD and SD to the POR via one satellite hop to the Napa teleport. From there they were sent up to a Pacific Ocean bird and then on to the various television distribution outlets in that region.

Since the satellite transponders used were limited to 36 MHz of bandwidth, there was no possibility of transporting full bandwidth HD from the venues to the BBC and back out to the distribution chain. However, as Intelsat had donated the space segment, there was no reason to use any less either, according to Robert Adler, whose company, Coastal Satellite, was engaged by Live Earth to provide transmission management. From that point it came down to which compression scheme to use.

"With 8PSK you can actually stuff another 20 Mbps into the same space [as you can with QPSK]," Adler said. "But there were many cases where the equipment around the world didn't exist in the quantities we needed to do it in 8PSK."

He chose to go QPSK at 36 MHz and had no problems. In fact, the last-minute addition of the Washington venue had to be done at 27 MHz, as they were running out of satellite space.

Both Tiernan HE4000 HD and SD encoders and Tandberg E5780 series high-definition encoders were employed at the origination sites and at the BBC, with both companies donating equipment for the Live Earth effort.

C-BAND BIRDS PAID OFF

Adler specified the more robust C-band satellite service be used, where possible, in areas where weather could be expected to be a factor. This decision paid off in spades in Shanghai, where it rained pigs and chickens during its concert. It also began to rain in Hamburg and with most of Europe, including Germany, dependent on KU band satellite service, the technical staff in London became concerned.

"We were receiving the Hamburg show on a nine-meter antenna, and we did see some degradation of signal," said Adler. "But it was well within margins, and by the time we asked for a little increase in power, the rain went away."

A severe storm warning had Adler's technicians keeping an eye on the Atlanta teleport, but the weather held in check. As the New Jersey and London venues were critical to the world feed, backup feed paths for both had been put into the contingency plans.

To simplify things in London, it was decided to convert as much of the concert video as possible to 25 fps, regardless of its acquisition frame rate, before transport from the originating site. For this conversion hardware, Adler reached out to For-A, which donated the use of several demo models of its FRC-7000 Frame Rate Converter for the task. Rental units were also used.

The late additions of Washington

CONCERT, PAGE 18

Weather

CONTINUED FROM PAGE 8

The CBS affiliate is owned by Landmark Communications, which also owns WSI and The Weather Channel. WTVF uses the latest WSI products, including TrueView HD for weather visualization; and Titan HD and Titan Impact, for its HD weather broadcasts and website operations.

Linda Maynard, vice president of media marketing for WSI, in Andover, Mass. said, "During severe weather, WSI's Titan Impact can analyze live radar information to provide viewers with up to the second reports on a storm's intensity and anticipated movement for superior threat analysis."

DYNAMIC DATA DISLAYS

WCPO in Cincinnati; WFSB in Hartford, Conn.; and WPRI in Providence, R.I. all use graphics technology from Weather Metrics, a Lenexa, Kans.-based company that takes a "hyper-local" approach to weather.

"Meteorologists need local sensors and cameras to better show what current conditions exist that will impact the forecasted weather for the area," said Peter Levy, president of Weather Metrics. "Our products are designed to measure, record, capture, and display hyper-local weather information, including time lapses for the previous 48 hours so meteorologists can show weather trends.

"Meteorologists need local sensors and cameras to better show what current conditions exist that will impact the forecasted weather for the area."

—Peter Levy, Weather Metrics

"After the storm has passed, our WxVision.Net product can assist meteorologists by showing video of what happened during the storm and what led up to the conditions that caused the outbreak," Levy said. Weather Metrics also offers the 24x7 Weather.Net digital weather channel system, which can display an entire local presentation of the past, current, and forecasted weather in the station's specific DMA.

While many broadcasters use technologies from companies solely dedicated to weather graphics, another well-known CG company is also increasing its focus on this expanding market. At NAB2007, Chyron of Melville, N.Y., announced a partnership with MeteoGraphics that will allow broadcasters to create weather clips, such as 3D terrain flyovers, using Chyron's Lyric Pro software and MeteoGraphics' WeatherSuite content creation system for 2D and 3D weather presentations. MeteoGraphics is a leading private weather graphics provider for broadcast, mobile, and online media applications, based in Berlin, Germany.

WeatherSuite uses radar, satellite and cloud forecast images as well as historic, observational, and forecast data from standard databases to produce weather programs with smooth, broadcast-quality graphics and animations, and gives users the flexibility to modify realtime weather data within seconds of going live to air. ■

WFLD uses its Live Power Doppler and Viper storm analysis software to generate images like this. Both technologies are provided by Baron Services.

Concert

CONTINUED FROM PAGE 16

and Kyoto left the production short of origination point FRC-7000s, so feeds from those sites were transported to London in their native frame rates and converted to 25 frames there with the For-A equipment.

Such frame rate conversions are not always worry free. According to Anthony Klick, For-A Eastern and Midwestern regional sales manager, "If there's any motion at all, the signal goes right to pieces."

The For-A FRC-7000 converter is able to cope with such problems. Users can just dial in the amount of motion compensation needed. A readout on the converter provides exactly the number of nanoseconds of delay introduced so that the same amount of audio delay can be provided to retain dead-on synchronization.

Leandro Blanco, director of mobile operations for All Mobile Video, which handled New Jersey mobile operations at Giants Stadium for Live Earth, reported that such signal delay reporting is an important feature in converters and other video processing gear.

"You can't sit there and be guessing what kind of delay you have, and for the most part, [the equipment makers] know what they're doing. There's nothing better than to have them tell you."

A great deal of attention was paid to lip-sync in the Live Earth production, and it seems to have paid off, as no complaints were reported during the concert's airing.

"We sent [lip-sync] test tapes to each venue so we could adjust any of the sync back at the BBC," said Live Earth's Mika.

They scheduled two half-hour full facility and signal path tests for each venue on the Friday before the production. These tests were extended to an hour each, or longer, if a problem had to be chased down.

The Shanghai venue had power surge problems on Friday. This not only knocked out their test session, but also some equipment as well, including an encoder. Tiernan located another HE4000 unit in China and had it shipped to Shanghai. Other gear was repaired or replaced, and a test window was opened three hours before Shanghai's scheduled transmission time on Saturday.

"We had all the problems cleared up in a half hour," said Adler.

It comes as no surprise that with music being the major component of Live Earth, sound quality was a major concern. Each venue's audio was recorded in Dolby 5.1, but as all portions of the transmission path couldn't handle 5.1, stereo was used for the world feed. The 5.1 audio mix has been saved for the DVD release scheduled for October.

"We solved any audio issues on test day," said Adler. "We were very satisfied with our audio across the board. I don't remember any issues during show day."

WEB FEEDS PRODUCED

A live stream of each individual concert venue was available on the MSN Web site, but for the first hours of the kickoff concerts in Sydney and Shanghai, the Live Earth crew at the BBC banked their feed material on servers. As the world feed hit the air, that banked material was integrated with short films and other messages commissioned for the production, along with footage sent from associated celebrations around the world.

In addition to the world feed, the crew in London also sent out highlight packages to the venues themselves that could be played on their big screens during band changeovers, making it a busy day at the BBC.

It was a busy day at Giants Stadium as well. All Mobile Video had rolled in three production vans, three auxiliary trailers and four satellite trucks. One of the vans was used for switching the world feed, a trailer programmed video for the big screens and other facilities were assigned for the production needs of Bravo channel's long day of Live Earth coverage and NBC network's three-hour primetime Live Earth special, which was all day in the making.

"Everybody did their integration differently," said Blanco. NBC integrated what they did their way; Bravo did it their way. And the people who did the screen did it their way."

Because NBC's primetime special was so heavily edited, they brought in a number of Avid editors. The special was produced in HD, and was aired on the network in both high-definition and standard-definition letterboxed format. Commercials were integrated from network headquarters in New York.

Bravo cut between world feed material they had taped and live elements from Giants Stadium, including many interviews by its talent. Bravo's coverage closed its last three hours with a repeat of the NBC special.

CNBC, from its Englewood Cliffs, N.J. studios, turned around seven hours of the world feed in standard definition on its cable network. MSNBC treated the Live Earth as news elements during its news programming, bringing in short Giants Stadium live shots to its regular news programming produced from the network's Secaucus, N.J. studios. NBC Universal's Spanish language networks in Hialeah, Fla. got in on Live Earth as well, with Telemundo producing a one-hour special. This production cherry picked acts from the world feed that fit their audience. Sundance Channel ran the entire world feed in standard definition, and Universal HD did the same thing in high definition.

INTERCOM IS CENTRAL

To hold the entire Giants Stadium production communication structure together, Firehouse Productions, which mixed the venue sound, monitors, and also supplied wireless microphone, had the responsibility for integrating the entire intercom system.

"With the trucks 1,500-plus feet away, analog intercom systems weren't going to cut it," said Firehouse Vice President Mark Dittmar. Firehouse deployed its three Riedel matrix intercom frames, one at the trucks, one at the stage and one at the front-of-house sound mixing location. There were all connected with a ring of fiber-optic cable. Dittmar said that by interfacing the Riedel system with the RTS Adam intercom frames in the trucks, 90 percent of the cabling otherwise needed was eliminated, and clear audio was delivered throughout the system.

ONE SLIGHT PROBLEM

So were there any noticeable technical errors in the Live Earth concert production?

Mika admits to one. Apparently the generator supplying power to the lighting equipment in Sydney ran out of biodiesel fuel before the end of that venue's program, and the last few numbers had to be done under house lighting.

"The only factors that really changed the look and feel were actually things that happened locally [at the venues]," Mika said. "Our signal was really uniform across the board." ■

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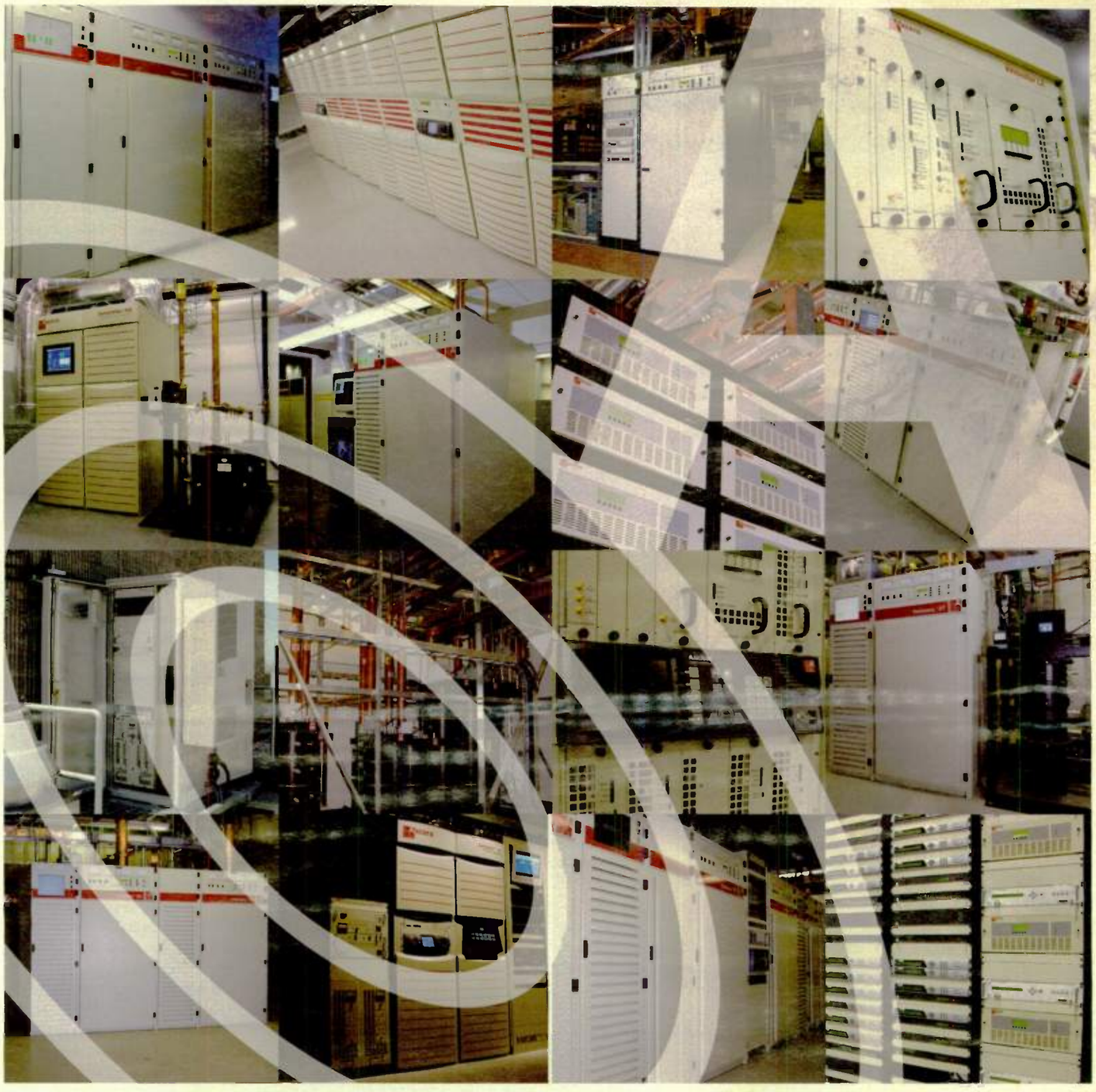

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SPECIAL REPORT

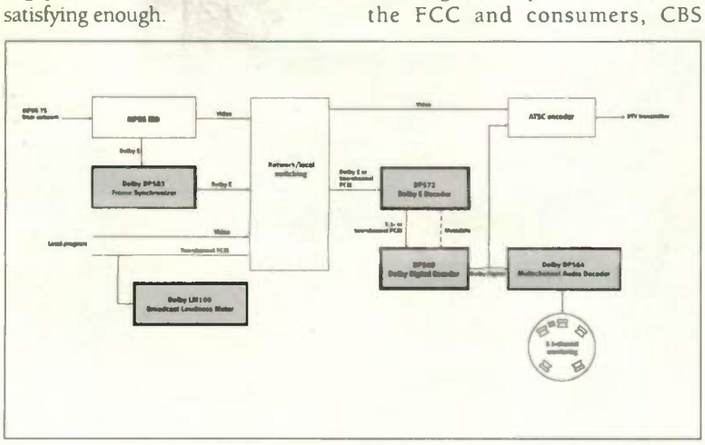
The Importance of Monitoring 5.1

Sophisticated consumers, multiple formats drive demand for new gear

by Ian MacSpadden

WASHINGTON

During the early years of television production, audio fidelity was simply neither a priority nor a concern to the broadcaster or to the consumer at home. Most television viewers were used to the tinny sound of AM radio and therefore were quite content with the similar audio quality that emanated from the small speaker in their television sets. The mere sight of moving pictures on their console was satisfying enough.



The recommended local DTV station audio infrastructure for Dolby Digital 5.1 and Dolby E.

Broadcasters relied on a trained audio technician—often from their radio division—to work in the television studio. The technician's job was to listen to the audio and monitor a Vu meter in order to keep the levels of the outgoing programming consistent. Metering and monitoring were fairly simple techniques, and if truth were told, stations relied on the trained ear more than any specific piece of equipment to measure quality of service.

The simplicity of the tools was only slightly modified over the years as broadcasters added stereo. As reception equipment became more sophisticated the viewer began to notice the difference in program levels, the stereo effect, and the fact that commercials always seemed to be louder than the program they were watching. Under pressure from both the FCC and consumers, CBS Laboratories led the industry in developing the first loudness control technology in the mid-1960s.

AUDIO SEACHANGE

Technology soon gave rise to more sophisticated equipment that gave broadcasters even greater control of their audio signal. This ability to electronically control and process audio signals eventually alleviated the need for a skilled audio engineer. Due to increasing use of automation and shrinking technical staffs, most broadcasters currently rely on operators with only limited knowledge of the true complexities of the modern audio signal—if they have a warm body at all. In stations that do use operators, many don't have the proper equipment needed to properly monitor or adjust the new digital signals.

> "Stations need to be just as committed to their final off-air product with 5.1 surround as they are with stereo."
> —Kevin Clayborn, Orban

The dynamics of audio signal management have certainly changed for the 21st century broadcaster. Broadcasters first began to make significant upgrades to their visual product with the implementation of HDTV. This brought about a focus on image resolution and a wider screen aspect ratio. Audio quality and format, as in the past, came second to video.

DVD and home theaters, however, have created a seachange in what the viewer wants and expects from broadcast audio. With high-end audio equipment present in increasingly more homes, the viewer is now also an avid listener who expects the audio and visual quality of their broadcast, cable, and satellite experience to match that of their cinematic DVDs.

"Stations need to be just as committed to their final off-air product with 5.1 surround as they are with stereo," said Kevin Clayborn, North American sales manager for Orban. The Tempe, Ariz.-based company provides stereo processing and loudness control systems to broadcasters—like their Optimod series processors—for both analog and digital systems.

Clayborn said that as with analog programming sources—whether network, local or syndicated—the challenge will be to keep them all consistent.

"Digital audio—or more correctly, a digital audio *stream* is a completely different animal than an old analog signal," he said. "Before, you could measure an analog signal with a voltmeter and determine the level of the signal volumetrically. That is not possible with a digital stream. The amplitude of the stream will be

IMPORTANCE, PAGE 24

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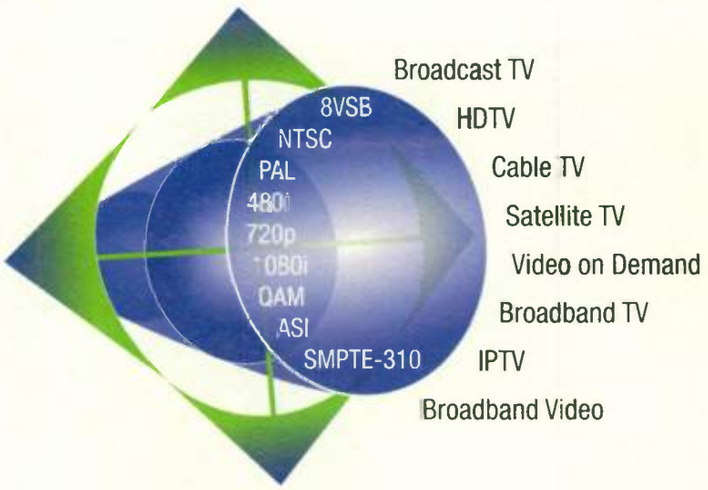

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SPECIAL REPORT

Multichannel Multitasking

Audio must be monitored through the entire distribution chain

by Michael Nunan

TORONTO

Amid the numerous challenges posed by creating a technical infrastructure capable of creating, distributing and transmitting multi-channel television sound, perhaps none is less obvious than the crucial need for comprehensive audio monitoring and metering.

Robust and easy-to-use audio monitoring is important at every step in the broadcast chain, and many individual processes and workflows have specific requirements. Two of them will be the focus of this article: the mixing environment (audio control room), and the engineering/distribution environment (QC racks, machine rooms, etc.)

THE MIXING ENVIRONMENT

While good audio monitoring has always been critical to the success of a mix, in the stereo world, it was never very complicated. The bulk of discussion over monitoring in the stereo era concerned the performance of different speaker systems which inevitably involved personal preferences as much as technical specifications. Beyond making sure that a given mix was mono-compatible, there wasn't much else with which an operator needed to be concerned. The advent of surround sound has radically changed this situation.

Working in 5.1 almost always means working in 5.1 in addition to stereo. This means that, at minimum, an operator needs to be concerned with two mixes. However, in practice, those two mixes need to be monitored in a variety of configurations, which creates the demand for monitoring equipment that exceeds our traditional requirements.

Large-format console manufacturers were the first to adapt to this new requirement, and operators lucky enough to be able to spend their days behind mega-buck consoles typically have all of the resources they require in this regard. But an increasing amount of television audio is being created in smaller, lower-budget environments, which lack the amenities afforded to their large-format counterparts. Take, for example, digital audio workstations and nonlinear edit suites, many of which are capable of working in surround without the need of a console of any type. These rooms, and audio control rooms that are making surround using older consoles, can all benefit from the addition of standalone monitoring controllers.

Consider the following monitor matrix (see Fig. 1):

				Lt/Rt	Lo/Ro	ProLogic II
		discreet (original mix)	Dolby Digital decode			
Multichannel	with Bass Management	√	√			√
	without Bass Management	√	√			√
Two-channel	with Bass Management			√	√	
	without Bass Management			√	√	
	Small (alt) speaker			√	√	
Mono				√	√	

Fig. 1: Audio monitoring considerations being encoountered in today's television

When working in 5.1+2, the operator needs to be concerned with his original 5.1 mix, in addition to the various combinations of 2-channel folddowns, matrix-encoded 2 mixes (ProLogic II, etc.), the decoded version of the matrix-encoded mix, and the Dolby Digital decoded version of the 5.1 mix. When you allow for the fact that many of these variations need to be monitored with and without bass management, and that the 2-channel mixes need to be checked in mono, you rapidly end up requiring a monitoring controller that can support a monstrous number of inputs and multiple speaker systems.

COMPLICATED TASK

While audio operators and editors are concerned with the complicated task of creating 5.1 mixes, the operators who staff many of the other technical spaces in the plant have different, yet equally challenging, monitoring requirements. Machine rooms, QC areas, distribution centers, master control rooms, and countless other technical areas appear at first glance to be less demanding than an audio-specialized part of the facility.

But in many respects, the reality of life in these spaces makes the monitoring problem even more acute.

Operators in these rooms are seldom audio-specialists, but are nevertheless working with the critical path of the TV signal and need quick, easy, and accurate ways to monitor an increasing number of signal types (embedded, discreet, encoded, compressed, etc). In addition, these areas are inevitably more hostile to monitoring (machine noise, HVAC, etc) than quiet audio rooms, and so the monitoring task in technical areas also needs to be combined with good metering (visual monitoring) systems. It's crucial for an operator to be able to visually learn about the status of an audio signal, and to identify problems, without having to rely on hearing the problem.

Working in 5.1 almost always means working in 5.1 in addition to stereo. This means that, at minimum, an operator needs to be concerned with two mixes.

Signal variety aside, the monitoring task becomes much more complicated, when the presence of ASI, MPEG, Dolby Digital or Dolby E also needs to be taken into consideration.

INCREASING AUDIENCE EXPECTATIONS

There are a huge number of sonic challenges facing broadcasters. A large amount of the complexity in digital broadcasting is wrapped up in new audio issues such as lip-sync, loudness management, and up/down-mixing. These concerns are demanding a lot of attention from broadcast professionals, and the increasing expectations of the audience when it comes to sound certainly adds pressure to get things right.

"It's OK leaving here!" is a time-honored television retort, but being able to say it in the heat of battle is predicated on knowing with absolute certainty the condition and behavior of signals leaving the building. As a result, the quality and capability of audio monitoring systems is exclusively responsible for our ability to have confidence in our product. With that importance in mind, it's equally true that compared with deciding on things like cameras, video switchers, and tape machines, spending large amounts of money and effort towards selecting audio monitoring systems is clearly not very glamorous. It is, however among the most important money you can spend. ■

Michael Nunan is the Post Sound Supervisor for CTV Television, based in Toronto, Ontario. He can be reached at mnunan@ctv.ca

Importance

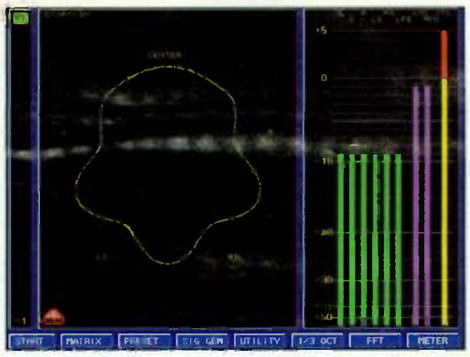
CONTINUED FROM PAGE 20

fixed, regardless of the dynamic range of the audio contained within that stream. Gone are the days when you could connect a pair of high impedance headphones to an audio wire to listen for signal presence. Today a device is needed to actually check the signal to see if it is present, and if it is in a valid format."

ARE YOU READY?

Not only is the digital signal more difficult to manage within the TV station, but delivering it intact to the viewer can also be a challenge. The problem for broadcasters who are planning on providing 5.1 surround is that not everyone is ready for it.

"Even though the broadcaster's signal may be in surround sound, the majority of the audience at home are listening in stereo or even mono, mixed down by their consumer TV or receiver," warns Niels Schou Frederiksen, R & D project engineer for DK-Technologies, a Danish provider of audio monitoring technology, with U.S. offices in Felton, Calif.



"Starfish" audio monitor display graphically presents 5.1 surround mix information to audio operators.

"Because all listening environments do not support 5.1 surround, broadcasters need to consider how to handle the transition from stereo to 5.1," says Rocky Graham, director of broadcast products for Dolby Laboratories in San Francisco.

And monitoring the audio stream in a 5.1 environment requires more attention from the broadcaster.

"It is not as automatic as it used to be," said Tim Carroll, president of Linear Acoustic in Lancaster, Pa. "5.1 channels of digital audio have fewer constraints than stereo analog, but the extra range and quality can quickly lead to loudness problems without careful planning. Further, all broadcasters should be aware that most all of their viewers will primarily receive their audio in stereo, some in mono. Less than 30% will get the broadcast in 5.1,although that number is rising."

"5.1 channels of digital audio have fewer constraints than stereo analog, but the extra range and quality can quickly lead to loudness problems without careful planning."

—Tim Carroll, Linear Acoustic

Tim Carroll

To aggravate the issue further, the programming suppliers are not consistent in the formats of the content that they provide the station. Most commercials and syndicated material will arrive in stereo, while network programming will be in surround. Then there is the local newscast whose content is almost always stereo or mixed mono.

"Broadcasters have to deal with almost all types of formats because of the material they have to ingest form other sources," said Michael Jordan, director of sales for Ward-Beck, a Toronto-based provider of audio processing technology. "There's still a large amount of analog material, and then a lot of the stuff we're dealing now is Dolby-embedded or Dolby-discrete; they have to go through decoding and then at that point it's usually in an AES format. We even convert right down to analog for them. We give them a 5.1 output that's in analog if they want to drive a 5.1 speaker set up that's similar to what a consumer has so they can make sure all the channels are aligned correctly and the levels are correct."

Another audio issue facing local broadcasters is the presence of audible artifacts resulting from the switching between 5.1 surround and stereo source material, according to Steve Strassberg, president of broadcast audio consulting company Strassberg Associates in New York.

"It is not something a broadcaster can fix," he said. "The viewer will hear clicks, pops, and even silence as their set-top box or receiver switches between 5.1 surround and stereo source material."

John Hartwell, director of engineering with Wohler Technologies in Hayward, Calif., said that audio issues are also arising from equipment in the plant itself.

"Clicks and pops can occur with new equipment transporting embedded audio in the SDI stream," said Hartwell. He cites this as a good reason for careful monitoring of the signal throughout the plant.

THE TOOLS

A wide range of equipment is available to the broadcaster to help manage or eliminate some of the issues that have arisen during the transition to surround sound broadcasting.

"In the DTV world, monitoring and measurement of the digital signal and metadata is critical," said Strassberg who adds that they have worked with multichannel metering products from Dolby, DK Audio, RTW, Wohler and Linear Acoustic. "They all have solutions for metering and some have additional features for monitoring audio and metadata in a compact form factor suitable for the master control environment of a TV station."

"There are two sets of parameters that really need to be monitored; the transport stream and the material itself,"
—John Hartwell, Wohler Technologies

Wohler's Hartwell recommends monitoring the audio at ingest, master control, and transmission. "There are two sets of parameters that really need to be monitored; the transport stream and the material itself," he said. Hartwell also recommends choosing a system that is "operator friendly."

In addition to using good quality speakers, the "JellyFish" and new "Starfish" 5.1 surround meters provide a new and very simple way to monitor the phasing and level relationship of all the channels in a very intuitive form scale.

The biggest complaint from broadcasters in monitoring 5.1 is the lack of proper monitoring tools, according to Strassberg.

"The stations usually do not have a proper listening environment or any tools for checking their final audio output. Many of these broadcasters, most of whom are not audio specialists, have to listen from home or a friend's house to ascertain their signal's final quality and compliance levels."

The sound many stations may hear in coming months may not be their surround signal, but rather the voices of angry viewers irritated with the lack of quality audio. To head this problem off, broadcasters will have to take their eyes off the picture and take a good listen to the sound. ■

Captioning

CONTINUED FROM PAGE 15

individuals to adjust their TVs to display small, normal, or large captions;
• More text and background colors, including see-through backgrounds to optionally replace the big black block;
• More text styles, including edged or drop-shadowed text rather than the letters on a solid background;
• More text fonts, including monospaced and proportional spaced, serif and sans-serif, and some playful cursive fonts;
• Higher bandwidth, to allow more data per minute of video, and multiple windows on the screen at the same time.

The difference between 608 and 708 captions can be described as the difference between a dumb terminal and a Windows or Mac operating system. But despite the new 708 authoring capabilities, most captions seen on DTV are not much more than NTSC captioning upconverted to the 708 format, according to Tony Zare, product manager, modular and captioning product line for Evertz in Burlington, Ontario.

"The industry has pretty much standardized on the translation of 608 captions to 708 as a standard practice," he said. "708 [capabilities] haven't been used because 608 is acceptable."

David Ko, technical product manager for Optibase Solutions in Mountain View, Calif., describes the situation in much the same way: "708 has about 10-times the bandwidth [of 608]. I don't think anyone's really utilized that extra bandwidth yet."

Because caption viewers, particularly the deaf and hard-of-hearing community, are unfamiliar with DTV captions, or that most own NTSC receivers and view analog channels, there may not be much clamor for the tricked-out 708 captions.

"Right now broadcasters have a bit of a false sense of security, because they've been putting something on the air for a number of years now, and [with their digital channel] they're not getting a lot of complaints early-on," said Phil McLaughlin, president of EEG, a Farmingdale, NY-based provider of captioning technology.

Harvey Barnes, vice president of marketing and sales for Konata, Ontario-based Norpak, which specializes in signal processing technology, echoed that thought.

"In our experience, most people are authoring 708 captions in a very basic way... they're not taking advantage of some of the extended capabilities of the 708 standard," Barnes said. "There's not a huge incentive for them to do that."

PROBLEM ORIGINATION

In fact, there's quite an incentive to keep it simple. Since caption authoring is mostly done on the fly, especially at the broadcasting plant, it's easy to imagine a misprogrammed step that could result in captions consisting of white text over a white background. Stranger things have happened.

For the home viewer, there is similar room for problems. In addition to the same colored text and background described above, a combination of hard carriage returns entered by the captioning's author and the viewer's playing with the font size could result in annoyingly inconsistent captioning line lengths. One can only imagine the frustration of a station's technical support staff attempting to prompt the viewer through a myriad of menu steps to reset a receiver's (or set top box's) captioning function to default.

However, to lay a caption viewability problem at the foot of the viewer requires the broadcaster to be sure the captioning problem is not in the source material, the broadcast plant's signal chain through caption encoding and broadcast, and signal distribution partners, including cable and satellite systems.

Larry Goldberg, director of media access at closed-captioning pioneer PBS station WGBH-TV in Boston, described a current problem a deaf viewer was having receiving a Boston affiliate's captioning via a DBS distributor.

"[The satellite company's engineers and the station's engineers] are troubleshooting the problem, and they need to hold hands," Goldberg said. "They're having trouble figuring out where the problem lies. So a local broadcaster needs to monitor those captions in all the separate ways that a broadcast is being distributed."

That means monitoring equipment beyond just a display of the captions themselves, according to Zare at Evertz.

"From a broadcaster's point of view, you would want to assure that the three parts of the caption distribution package [header information, the body, and footer information] are formatted correctly," he said. "Is it working 100-percent, or is it working by fluke?"

EEG's McLaughlin cautions broadcasters against using waveform monitors, as they frequently did for NTSC captioning analysis, to monitor DTV captions.

"If you looked at a signal, they decode the 608 data better than the 708, and they'll actually show you that the captioning is present," he said. "As far as the broadcaster is concerned, they monitored the signal, they see the captioning in the waveform and say 'Hey, it's Miller time, we're done!' And in reality, that's not what they're obligated by the FCC to produce."

If a broadcaster finds his captions are disappearing as they pass through a particular piece of equipment in the plant, an alternative to replacing that equipment is to use a bridging solution that decodes the captions on the input side of the problem box, and passes them to an encoder placed at the output side. (Luckily we're not talking about lip-sync audio here, and mis-matching the captions a few frames one way or another is not likely to generate complaints.)

High-definition closed captioning seems to have caught some parts of the post-production community by surprise. Dilip Som, president of Rockville, Md.-based Computer Prompting and Captioning, which makes a software-based product that inserts closed captioning directly into a pre-produced video file, said incompatibility between some different brands of servers has blocked the transfer of caption data as the video is transferred.

"Until these people get their acts together, which they can, they're blocking the closed-captioning information," Som said. "We're working with all of them to get a resolution here."

As noted at this article's beginning, implementing NTSC's captions was not a smooth process either. But with time and attention, EIA-708-B will similarly become a mature and reliable technology. ■

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NEWSROOM TECHNOLOGY Harlan Neugeboren

The iPhone: Providing Easy Access to Content

OK, I had to jump on the "everyone is talking about iPhone bandwagon" and at the same time explain how this relates to news technology. This is not a review of the iPhone and how it operates. It is a discussion of how the iPhone lets users get their content easily and why broadcasters should pay attention and apply these lessons to their own situation.

THE USER EXPERIENCE

The most important thing for broadcasters to remember is that it's the content that matters most but it's also important to look at how viewers get their content from broadcasters. The iPhone makes it very easy for users to get the content they want, when and where they want it. More importantly, the iPhone was designed by the team at Apple who know how to create interfaces that are easy to use—the iPod and iTunes.

The iPod features a large-screen with large and easy-to-understand icons and uses a very intuitive and advanced touchscreen. The screen changes direction if you turn the iPhone sideways. The touchscreen uses multifunction technology that allows you to manipulate what's on the screen by the way you use your finger—sliding or tapping or pinching fingers together.

The iPhone makes it very easy for users to get the content they want when and where they want it.

CONTENT IS KING

Applications like e-mail, Web browsing and SMS are easy to access via the icons. Your voicemail messages appear in an on-screen list and are accessed by one-button push. Text messages appear as a thread so you can follow the history. The Web browser is amazing as it displays Web pages the way they appear on a Web browser. Many Web pages are being designed specifically for the iPhone.

So if the way people consume content is as important as is the content itself, and if users can get to the content they want or think they want easily, they will be more likely to watch it. That said, the content has to be good enough to keep the viewers attention once they get there. Content is king but only if your viewers can get to it. So make it easy for them.

Many people get their news on devices like the iPhone, so when we produce the news for platforms other than the TV screen, we should ask ourselves: How will this look on an iPhone or Treo? What would add to the experience? What news and information would be useful to the viewer? In other words, put yourself in the viewer's shoes. Also, try experiencing your content on a phone, computer or other portable device. How do you like it?

Producing content that viewers will use for the second and third screen is not as simple as taking your existing packages and flipping them to iPod or 3GP formats. Some content will work for this but in many cases you will need to produce stories specifically for these platforms.

If you look at the life of a story and examine the way you are shooting the story, it may be very easy to shoot additional footage like background information or an entire press conference and encode it to put up on the Web. Also, you may be able to get information such as contact names and numbers out of your assignment grid as XML and put it on the Web or cell phones.

The important point is that you produce content that is appropriate for the distribution platform. Long-form content probably works better on the Web or IPTV, whereas short-form reports would work well on iPods or mobile devices. In either case, you should make your content available for all platforms and let the user decide. A viewer may have a one-hour train ride in the morning and may want to watch last night's mayoral state-of-the city address on their ride to work.

Apple is able to do this by producing video content in iPod format and then letting the users watch it on Apple TV, their Mac via Front Row—the Apple TV and Front Row user interfaces will be the same when Leopard is released—or on their iPod/iPhone.

LESSONS LEARNED

When the iPod first came out it was not a very novel product in that it was a music player at the time when there were a number of MP3 players on the market. What made the iPod different was the user interface. It was simple and easy to use. No complicated menus, just simple one-line descriptions of what you

iPHONE, PAGE 35

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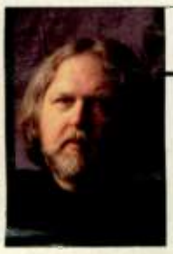


Photo: Steve Jordan

NET SOUP

Frank Beacham

Reinventing Webcast Production

Thirty-five years ago, during the first portable video revolution, the definition of mobility was stretched to an absurd limit.

Yes, compared to the huge broadcast remote vehicles of the 1960s, video crews in the '70s were light on their feet. That is, if light was interpreted to mean more than 50 pounds of electronics on one's back and 20 heavy shipping cases loaded with support gear!

At the time, working filmmakers like Ross Lowell and Anton Wilson began to fill in the missing pieces needed by those of us embracing early small format video technology. Each started companies that became pioneers in their field.

Ross, a man of many talents, invented the original Lowel light and, in 1980, won an Academy Award certificate for his creation. His classic book, "Matters of Light and Depth," is a definitive reference. His designs redefined video lighting in the 1970s and those great portable light kits live on today at Lowel-Light Manufacturing in Brooklyn.

Early nickel-cadmium batteries were as heavy as bricks—a single battery pack outweighing many of today's compact camcorders. Since a charge often lasted no more than 20 minutes with tube-based video cameras, it took boatloads of batteries just to get through a day of shooting.

Wilson, a working filmmaker, saw a better way. As co-founder of Anton-Bauer, he helped create a battery and charging system that forever changed videography. He and the company received an Emmy award for battery technology in 2000.

Just as Lowell and Wilson reinvented essential production tools in their time, a new generation of designers is now hard at work on an impressive set of refinements using the latest technologies.

Just as Lowell and Wilson reinvented essential production tools in their time, a new generation of designers is now hard at work on an impressive set of refinements using the latest technologies.

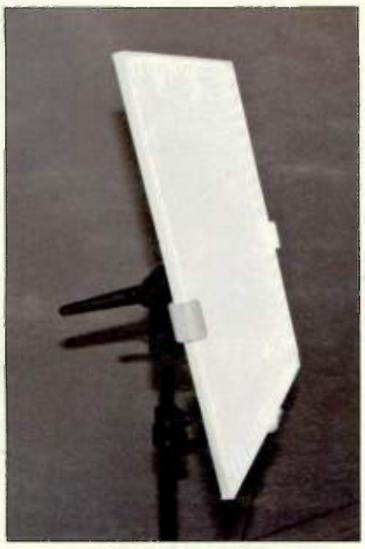
I recently purchased a Canon HV20 high-definition camcorder for interviews, and have been investigating accessories that reduce the size and weight of the associated gear. My goal is a complete minimalist production kit that can be easily carried and quickly set up by one person.

The good news—thanks to the latest technology and designs—is this is entirely possible. For this column, I'll start with two key areas: light and sound.

LIGHT SOURCE

First of all, Lowel-Light is still hard to beat for video lighting. The company's 200 W Rifa-lite 44 creates perfect soft illumination for interviews, and comes in a kit that weighs only 9 pounds. Setup takes about a minute. It's cost-effective, portable, and convenient.

However, watch out for new LED technology. Though most LED lights are still quite expensive, it's clear there are major benefits to this new generation of illumination. I predict LEDs will soon become the lighting source of choice for highly portable video production.



Rosco LitePad

Since large quantities of light are no longer needed for light-sensitive camcorders, LEDs can easily replace conventional fluorescent tubes or incandescent lamps. LEDs are smaller, run cool, and draw little power. And, in some models, color temperature can be adjusted without using gels.

I've been experimenting with a Rosco LitePad, a new slim profile soft light that's only 0.3-inches thick. The largest model, a 12-by-12-inch panel, draws only 14.4 W and 1.2 amps. At 24 inches from the subject, it produces about 35 foot-candles.

Essentially, the LitePad is a flat, white panel with a row of LEDs integrated along the outer edges. When illuminated, the entire panel glows with a soft even beam of light. With an optional bracket, the panel mounts on a standard light stand.

LitePads, with a color temperature between 6,000-7,000 degrees Kelvin, range in size from 3-by-3 to 12-by-12 inches and cost from $170 to $470 including AC adapters. A kit with 12 assorted panels is available from Rosco for $2,698.95.

Though Rosco is marketing the panels for accent lighting and special effects, we found the large panel worked well for recording single person video interviews. Though the price is a bit steep when compared to more traditional lights, these panels are amazingly flexible, require minimal power, and can travel in a brief case.

AUDIO GEAR

Another traditional production tool modified for contemporary video use is the DV ProMix 3 audio mixer from Professional Sound Corp., a veteran manufacturer of pro audio gear based near Los Angles. There are

many great portable audio mixers on the market, but the DV ProMix 3 was designed for use with small pro and consumer camcorders.

An extremely lightweight, three-channel, battery-powered mixer, the DV ProMix 3 works with virtually any microphone or sound source while offering some conveniences for small-scale videographers. It goes for about $470.

The mixer offers a reference tone for easy level matching with one or more camcorders, and connects to the camcorder through switchable level XLR outputs or a 3.5 mm stereo mini jack.

It also has a tape return function with level calibration, so sound from the camcorder's headphone output jack can be easily checked through the mixer. Since many camcorders have limited audio headroom and can be easily overloaded, the built-in automatic limiter compresses the signal at a ratio of about 2.7 to 1 to prevent distortion.

DV ProMix 3

We found the DV ProMix 3 an ideal companion to the Canon HV20, which has manual audio capability but 3.5 mm consumer connectors. A single cable from the mixer's output to the camcorder's mic input handles the two-channel feed and a cable out from the headphone jack allows monitoring over the mixer's headphones.

The mixer's two 9 V batteries easily service three 48 V phantom-powered microphones, and the separate XLR output pair can feed a supplemental audio recorder.

The bright LED peak reading meters, which emulate the camcorder's level indicator, are easy to read and color-coded.

Not only is it a great portable mixer, but the DV Promix 3 is priced appropriately for inexpensive video packages and has one of the best written operations manuals I've ever encountered. Whether for video or audio-only Webcasting, this beautifully designed audio mixer is a real winner!

As the democratization of media takes hold on the Internet, it is great to see that innovators are continuing to reinvent the tools needed for creative production.

For information on the Rosco LitePad, go to *www.rosco.com/us/video/litepad.asp*. For the PSC DV Promix 3 visit *www.professionalsound.com/Catalog/DV%20Promix.htm*.

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

We found the DV ProMix 3 an ideal companion to the Canon HV20, which has manual audio capability but 3.5 mm consumer connectors.

RF TECHNOLOGY

Doug Lung

Mobile TV Using Existing ATSC Technology

A paper from Triveni, "TV Broadcaster Connecting with the Mobile User," presented by Richard Chernock at NAB2007 offers an easy way to implement a form of mobile DTV.

Triveni's "Skyscraper" product was introduced several years ago and propaper printed in the 2007 NAB Broadcast Engineering Conference Proceedings.

The difference between this mobile connection and the one being developed as the ATSC M/H standard is that it isn't real time. Triveni's paper explains that real-time reception of

One of many items ATSC will have to consider in evaluating the proposals is their compatibility with the existing ATSC transmission standard.

vides a way to transmit data in the ATSC signal. The data is received on specialized ATSC receivers and a computer running Triveni software. Triveni tested the system in a vehicle in New York City to see how well it would work in a mobile environment. In his presentation at NAB, Chernock said that a significant number of the files were received, although data on the testing wasn't included in the

video programming on the road is needed primarily for passengers in the car. Most driving is done alone, which diminishes the need for high-bandwidth real-time content.

Although conventional ATSC reception may not work while the car is in motion or parked in an underground parking lot, during stops while driving or while parked on the street it often does work, especially with fifth generation demodulator chips. The Triveni paper lists several applications suitable for stored content. Updating traffic information requires only small files that can be updated every 5 to 10 minutes. Weather forecasts and localized "point of interest" information, with

This screen shot was taken while viewing KCET-HD off-air in Terminal 2 at LAX.

more graphics, take file sizes up to 500 KB that would be transmitted as less frequent intervals. Larger files, transmitted less frequently, could include audio podcasts for the driver and video programs for passengers.

Triveni's Skyscraper Web page, (*www.trivenidigital.com/products/skyscraper.asp*) shows the technology available now. Triveni software and a supported receiver are required, limiting widespread use of the technology.

I see one way to increase interest in ATSC file transmission. Rod Hewitt's TSReader, a transport stream analyzer, decoder, recorder and stream manipulator for MPEG-2 systems, can receive the data streams using a wide variety of ATSC tuners. Combine the data routines in TSReader with Triveni software to manage the "receive, store and assemble" functions needed to handle intermittent reception on most off-the-shelf USB tuners. Then make it available for download on the Web at a reasonable cost, or even for free in an advertiser-supported environment, and thanks to inexpensive USB tuners from AutumnWave, DVICO, Hauppauge, Pinnacle and others, there would be an instant audience.

ATSC standards such A/90, A/95 and A/97 describe how to transmit data and software updates over the ATSC stream, (see *www.atsc.org/standards.html* for copies of these standards and associated documents). Triveni isn't the only company able to implement the standards. As I'll describe later, an increasing number of USB ATSC chip sets now work under Linux, which could provide an inexpensive way to make this technology available in a wide variety of products.

ATSC MOBILE/ HAND-HELD STANDARD

My last RF Technology column described MPH and A-VSB demos at NAB. In June, 10 companies submitted proposals to ATSC. While some of these only considered data formats and content management, submissions by LG, Samsung, and Micronas involve transmission. The LG and Harris MPH proposal and the Samsung and Rohde and Schwarz A-VSB proposal have been widely discussed.

I've seen no public details about the Micronas submission. Rich Citta, the chief scientist at Micronas, developed high performance 8-VSB receiver technology at Linx before it was acquired by Micronas. Three years ago at NAB, Citta reported on the successful testing of a single-carrier mobile DTV transmission system. That system used a 4-VSB signal with half-rate coding. It will be interesting to see the technical details of the Micronas proposal. Detailed technical proposals were due at ATSC July 6.

One of many items ATSC will have to consider in evaluating the proposals is their compatibility with the existing ATSC transmission standard. A criticism of Samsung and Rohde and Schwarz's A-VSB proposal is that it modifies the adaptation fields in the ATSC standard, which could preclude use of these fields for future ATSC enhancements on systems not using A-VSB.

LG and Harris said their MPH proposal does not change the adaptation headers or PSIP and does not disturb the error detection/correction of legacy DTV receivers. When this was written LG and Harris had released few technical details to the public on how the MPH system works, but their presentation at the NAB Mobile TV session emphasized compatibility with existing ATSC receivers. New service data is processed at the packet level and concatenated processing is used at the trellis level. While earlier statements indicated the system would only work with specialized Harris STL systems, the NAB presentation said no changes or additions are required to the STL.

MOBILE, PAGE 39

Not All Masterpieces Hang In Museums

Mona Lisa is a masterpiece of art
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TECHNOLOGY CORNER — Randy Hoffner

Successor to the Compact Disc?

It has now been more than 25 years since the compact disc was introduced to the world. We might remember that there were—and still are—those who disparaged the sound of the CD, preferring the venerable vinyl disk, which has become a collector's item. The CD was revolutionary, of course, because it is a digital audio recording. Although digital audio recorders had previously been used professionally, the CD was the first digital medium available to the general public.

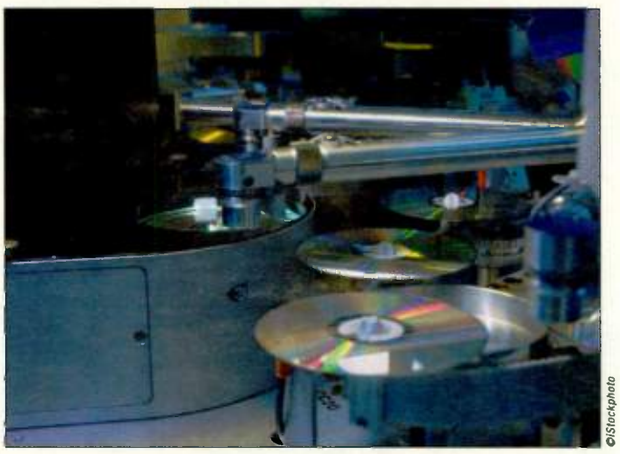
BREAKING IT DOWN

The technical characteristics of the CD reflect the state of the technology at the time it was developed. The audio data on the CD is in the form of PCM, or pulse code modulation. In PCM, the amplitude of the analog audio waveform is sampled periodically, and the samples are quantized: Each sample is assigned one of a number of specified values or quantization steps. The number of quantization steps available depends on the bit depth, which is 16-bits in the case of the CD.

Each sample has to be represented by a specific quantization step, but any given sample's value may not fall precisely upon a step; in which case the step closest to the sample's value is assigned. The distance between the sample's actual value and the nearest quantization step is called quantization error, and the aggregate of quantization errors is known as quantization noise.

It can be seen that quantization errors are really signal-related distortion components, not uncorrelated noise. The greater the number of quantization steps available, the closer any given sample is likely to be to a quantization step, so quantization noise is an inverse function of bit depth—the more bits available, the lower the quantization noise. The bit depth of CD audio is 16-bits, which means that there are 216 or 65,536 discrete quantization steps available.

The technical characteristics of the CD reflect the state of the technology at the time it was developed.



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PCM CODING

PCM audio is subject to the Sample Theorem, which states that in order to perfectly reconstruct a sampled waveform, at least two samples must be taken per cycle. This means that no frequency higher than twice the sample frequency may be accurately represented in the reconstructed analog output. In the case of the CD, the sample frequency is 44.1 kHz. Half of 44.1 kHz is 22.05 kHz, and in order to avoid aliases, signals input to the sampler/quantizer must be limited to this frequency or lower.

If all the foregoing conditions are met, the reconstructed analog output waveform of such a system will be a perfect representation of the original analog waveform with some quantization noise added. In addition to the anti-alias filtering required before the analog signals are sampled and quantized, there must be reconstruction filters on the digital-to-analog conversion side, to remove the images, which are harmonics of the sampling frequency.

We note here that the above principles apply to any waveform that is sampled and digitized using PCM, including audio and video. A notable example of PCM-coded video is the ITU 601 component digital SD video with which we are well familiar. In many cases, including HD video, some form of data compression is used, as PCM coding generates an impractical quantity of data.

SUPER AUDIO COMPACT DISC

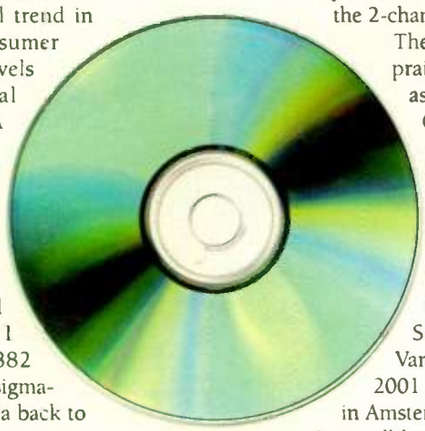
The developers of the original Compact Disc have now developed the Super Audio Compact Disc, which, instead of PCM, uses a coding technology called Direct Stream Digital or bitstream coding. DSD makes use of sigma-delta 1-bit conversion. Delta modulation has been with us for some time, having been developed in the 1950s. As its name implies, it takes account of the signal's amplitude delta—the amplitude change between a sample and the sample that precedes it. In essence, the sigma-delta A/D converter is a simple device. It uses a negative feedback loop to accumulate the analog audio waveform over each sample period.

If the amplitude of the accumulated waveform over a given sample period is greater than that of the previous sample period, the converter outputs a "1." If the amplitude of the accumulated waveform over a given sample period is less than that of the previous sample period, the converter outputs a "0." This is a kind of pulse density modulation, as positive-going waveforms will produce many 1s in sequence, while negative-going waveforms will produce many 0s in sequence. The sigma-delta decoder performs the inverse operation.

It is apparent that if we have but a single bit to express the amplitude change between samples, as opposed to 16-bits for traditional CDs, many more samples must be taken in a

given period of time in order to accumulate the requisite information density. In the case of SACD, the sample rate is 64 times the 44.1 kHz sample rate used by CDs, or about 2.822 million samples per second. This yields an analog frequency response up to 100 kHz, and a signal-to-noise ratio of about 120 dB.

WHAT'S AVAILABLE TODAY



There has been a general trend in recent years regarding consumer equipment of all quality levels away from the traditional resistor-ladder type of D/A converter to the sigma-delta type converter; not in the least because it can be made smaller and at lower cost. Many of these are 1-bit sigma-delta converters, which first interpolate and up-sample the 16-bit, 44.1 kHz CD data to 1-bit, 2.882 mHz data, then use a 1-bit sigma-delta DAC to convert the data back to analog audio.

The advantages cited for these converters, and for the entire DSD A/D-D/A system, are the elimination of the requirement for anti-alias and reconstruction filters, wide frequency response and high signal-to-noise ratio. Nothing is free and the penalty exacted by the 1-bit sigma-delta process is a high noise level; but the perceptible noise is reduced by aggressive noise shaping, in which the noise is pushed up above the audible spectrum. It must also be said that newer high-end sigma-delta DACs are increasingly of the multibit variety, frequently in the range of 3-bits.

SACDs of course use high-density recording techniques. Conventional CDs contain about 750 MB of data, while SACDs, like their high-density relatives DVDs, can contain about 4.7 GB of data. SACDs on the market today are typically hybrid discs. They contain a layer of conventional CD data, and also a layer of high-density data, so that they may be played on conventional CD players as well as SACD players. The SACD signals can contain up to six audio channels, as opposed to the 2-channel capability of CD signals.

There are those who ecstatically praise the sound of SACD audio as a tremendous advance over CD audio. For a different technical opinion, the reader is referred to Audio Engineering Society Convention paper 5395, "Why 1-Bit Sigma-Delta Conversion is Unsuitable for High-Quality Applications," by Stanley Lipshitz and John Vanderkooy. It was presented in 2001 at the 110th AES Convention in Amsterdam.

It is well known that in the digital process, the addition of a small amount of uncorrelated noise, called dither, can reduce or eliminate correlated quantization distortion components from the signal, leaving a benign floor of uncorrelated noise. Lipshitz's and Vanderkooy's contention is that 1-bit sigma-delta converters are in principle not perfectible, because when they are properly dithered, they are operating in constant overload, while multibit sigma-delta converters are infinitely perfectible, as they do not have the 1-bit headroom constraint.

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

Conventional CDs contain about 750 MB of data, while SACDs, like their high-density relatives DVDs, can contain about 4.7 GB of data.

iPhone

CONTINUED FROM PAGE 28

were looking at—artist, album, song.

The iTunes interface was also easy to use. People from all generations could figure out how to burn their CDs, organize their music and download it to their iPod.

The same is true for the iPhone. It is easy to use, very functional and easy to configure. You don't have to deal with AT&T customer support, you just plug it into your computer and configure it through iTunes.

What Apple has shown us through all of its products is that if it's easy to use and makes your life simpler, then people will use them. They spent a lot of time on user interfaces and you should too.

Put yourself in the shoes of your viewers or better yet ask your kids, friends or relatives what they think about your latest idea. Test it out on them first before you release it to your viewers. Ask them to sit down at your Web site and take it for a test drive. Do they find what they want easily? Is the content something they can't get elsewhere? Differentiated, original and local content will win every time.

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

MEDIA SERVER TECHNOLOGY

Karl Paulsen

Servers Enable Newsroom Workflow Changes

The advent of solid-state, optical and magnetic spinning discs for the capture of field content is moving newsroom editorial functions into an improved, high-speed workflow that changes how news is prepared and multipurposed. Technologies enabling this change include the physical media (e.g., Blu-ray, P2, or direct hard drive recording); the camcorder systems that generate proxies as a low-resolution copy and/or as thumbnail renderings; and the servers that manage essence and metadata throughout the process.

The result is editing systems that support collaborative editing and allow content to move from field to air in a smoother, more efficient means.

METADATA SERVERS

This workflow process requires new forms of servers that collect content in the field and move it to laptop or purpose specific editors; servers that cache thumbnails or low-resolution proxies for a reviewer to make pre-production decisions from; and servers that collect higher resolution content (i.e., IMX, DVCPRO-HD, DNxHD, etc.) and then marry those images with their proxies and associated metadata in preparation for editing and play to air. Beyond video- and audio-centric servers, metadata servers manage various sets of information related to the content, then translate or manipulate that data for applications such as newsroom computer systems, rundown automation systems for play-to-air, or archive directors that manage content for other purposes.

Content may be further aggregated for Web publishing, streaming media RSS feeds. Metadata is then pushed into an asset management database whereby information associated with this ancillary material is then linked wtih current content from previous stories allowing for user interaction and searching. Finally, one must not forget the mobile-handheld device, whose content is generated by rate shaping and reformatting to give that message its new up close and personal version—that can then be promoted with advertising, yielding new revenue to support those new technological aspirations.

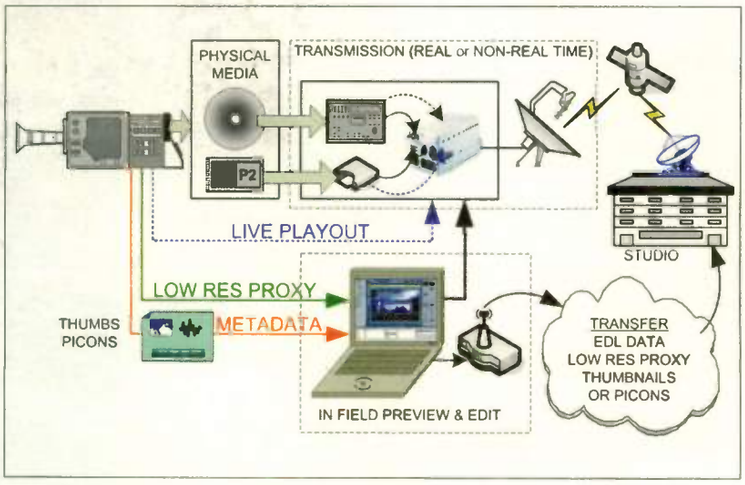


Fig. 1: Field acquisition and transfer workflow

All these processes require both a collaborative and an associative workflow environment, the later topic which we will introduce this month and carry forward in greater detail over future installments. We'll start with the collaborate workflow, whereby we define by example applications currently used by broadcast and news service organizations.

COLLABORATIVE WORKFLOW

First, content gathered in the field is selectively segmented from outtakes, possibly tagged by version or slug, and then organized for preview on either a portable or laptop editing system. A reviewer, possibly the journalist, the field producer or maybe a person located at the newsroom home-base—will select clips and determine which are appropriate for the final edited segments. Metadata is formatted for the home-base editing system and the newsroom computer system, which is then readied for transmission, with the proxies or thumbnails, to home base (see Fig. 1).

Depending upon features in the camera capturing platform, reviewers can set in points and out points, add to metadata that may already be captured from the camcorder and then automatically associate the items to the physical media acquired during field capture and field-reviewing processes. This happens shortly after acquisition, given camcorder systems may partition metadata

The idea is to minimize the amount of physical data transferred, and hence the time it takes for transfer—all the while allowing the workflow to progress without encumbering other tasks or assignments.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and proxies from the high-resolution content, and allow it to be exported from the camera platform to the review platform with little human intervention.

Once the content's metadata, thumbnails and/or their low-res proxies are downloaded to a reviewer's laptop, the larger files on the physical media—still in the camcorder portable memory—are record lockout marked to prevent accidental deletion. Once protected, the reporter/camera team can disconnect and move on to the next assignment.

Using proxies or thumbnails, content is then further reviewed on the laptop, where it may be assembled into packages consisting of proxies and metadata. AirCards, cell phones or the Internet provides the transport of this content to the newsroom. These rough elements can now take their place in the next step of the production process.

Higher-resolution content, still held on the camcorder memory, will be transferred later in the workflow. By the time high-res files are transferred to the newsroom-editing server (via microwave or sneakernet), only files previously identified by the reviewer, or the rough-cut editor, need to be transferred. Other files may be deleted or later moved to archive when or if needed.

The idea is to minimize the amount of physical data transferred, and hence the time it takes for transfer—all the while allowing the workflow to progress without encumbering other tasks or assignments. Eventually, the high-res files catch up in the workflow as editors seamlessly find their full resolution content appearing on the editing servers, ready for cutting as a final story.

GETTING IT READY

Second, in our collaborative workflow process, content needs to be utilized by multiple persons to assemble various other elements such as teases, previews or promotional elements—without having to make copies of the same content, and without waiting for the final cut story to be completed. This makes for faster and more flexible utilization of content long before the story airs on the 5 o'clock news.

Historically, as in videotape-only models, each tape element was physically brought to the edit bay and copied so that other editors on different transports could edit their piece. This model vanished as nonlinear, newsroom editing servers surfaced, moving to the next generation field-tape/NLE-server model, whereby multiple persons edited different stories from the same material. Here, the drawback comes from the linear nature of videotape which first forces all the unscanned content to be ingested, cataloged and then tagged for in-points and out-points. Metadata was hand written on notebook paper and carried to the next portion of the editorial process.

In this model, ingest happened in real time and although some server-based NLE systems allow editing to begin shortly after ingest, the lack of pre-review functionality prominent in today's solid-state or random access disc systems still created a bottleneck.

Historically, as in videotape-only models, each tape element was physically brought to the edit bay and copied so that other editors on different transports could edit their piece.

Today, videotape/NLE-server models are slowly evaporating in favor of the new demands for instant availability. The rule seems to be that the faster content can move from image-capture to preview to finished segment, the more opportunity there is for associative uses of that content. Station Web sites are proving that people will accept stories or information in a less than polished form—in turn bolstering viewers and building loyalty. As content becomes available 24/7 and the audience evolves, cell phones, PDAs or laptops will provide the new means of distributing information. This, in turn, is where an adjunct workflow requirement begins.

In the next installment, we'll explore this associative workflow concept, the second part of the fundamental change in the news environment.

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

INSIDE PRODUCTION Walter Schoenknecht

Video Awards Are The Big Winner

I think I'm going to start a video awards competition. Now, I'm not talking about a film festival, like New York's Chelsea Film Festival or Los Angeles' Silver Lake Film Festival. These are all about artistic films, not purpose-produced video. They're also real, tangible, physical events, which take place all over their communities with as much local color and texture as the Tulip Time Festival in Holland, Mich., or the Valparaiso Popcorn Festival in Valparaiso, Ind. But that's too much work.

I want to start an awards program just like all the competitions I receive flyers for all year long: a virtual festival, one with no theaters and no awards ceremonies... maybe not even a street address. Just a place to send the checks.

LICENSE TO PRINT MONEY

Never mind the dozen or two mailers which Joe the Mailman dumps in my inbox over the course of a year; there are actually hundreds—if not thousands—of these competitions out there. A quick Web search turns up scores of legitimate-seeming sites for awards both highly specialized and hopelessly generalized, with typical entry fees from $50 to $250. In almost every case, the listing of last year's winners runs into the hundreds of names; it would have been quicker to list those who entered but didn't place.

As near as I can tell, you don't need much to get one of these babies launched: a suitably pompous foundation name, a sharp-looking Web site, and a statuette with a goofy nickname, like the Sloopy or the Itsy. Sillier is better.

There are several fundamental rules that all video awards organizations are bound by.

Rule 1: Everybody wins... or nearly everybody. Winning makes people happy, and that's what we want most... to make people happy. Happy enough to enter! What's the point of entering a competition if you're not going to win?

Rule 2: There's got to be a significant entry fee. If the fee isn't significant, how good can the festival be? The logic is irrefutable: "If you want to win big, you need to spend big." So don't be a loser—cough it up.

Rule 2A: The statuette or plaque isn't included in the entry fee. You *know* you want it. It's really, *really* shiny, and it has *your* name on it, so how could you not want to pay extra for it?

One of the ways to guarantee that everybody wins something is to have an infinite number of categories, like Best Non-Bloody Surgical Video and Best Video of a Greasy Transaxle. Of course, just in case your program itself doesn't win, you'll want to hedge that bet by entering your own considerable talents for a craft award, like Best Microphone Technique Involving A Silk Blouse. In the end, the goal is to provide each entrant with a category, which appears to fit uniquely well in addition to all the others he or she will blindly enter with no hope of winning.

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Entering my competition will be a streamlined process, made as painless as possible by the elimination of boring questions about purpose and intended audience and instructional design. I envision a space for the program name, one for the entrant's name, and a line for the credit card number. Shouldn't really need much else. Oh, and the category, I guess. And to keep it honest—to showcase the entrant's competitive spirit—I'll include a checkbox labeled "I Want To Win (check here)."

We'll need judges, too, because we'll want everything to be above board. Everyone knows that agreeable judges are much more fun than crabby judges, so that's who we'll recruit; credentials in the business aren't required, since experienced professionals are more likely to get testy as they watch hundreds of hours of everyday, garden-variety video programming. One awards Web site I researched listed the judges' credentials: "Visual Artist and Tango dancer;" "Attorney;" "Vocalist, bassist, and guitarist;" and "Learning Specialist in the Math Lab." Really.

AWARDS AS REWARDS

For most of us, the only return on our awards investment is the ability to decorate the lobby, or the edit suite, or the break room, with our accumulated booty—plaques, certificates, statues and silver nut-dishes.

Occasionally, though, these otherwise-worthless-seeming awards and competitions can actually generate real monetary return. One corporate client of ours mistakenly tossed out the notion of winning an award during his performance review last year—and promptly found it on his list of personal benchmarks for this year. Translation: No statuette equals no bonus. The likely candidate for an award was our video celebrating his firm's merger into a larger organization; when the merger fell through, the video was shelved, and the client's desperation was palpable.

Not to worry, though, one of his staffers dug up a competition with that one special category which fit like no other: an entire section for Video Presentations Cancelled Prior To Release.

Bingo.

Walter Schoenknecht is a partner at Midnight Media Group Inc., a New York-area digital production facility. You can reach him via e-mail at walter@mmgi.tv.

A quick Web search turns up scores of legitimate-seeming sites for awards both highly specialized and hopelessly generalized, with typical entry fees from $50 to $250.

Mobile

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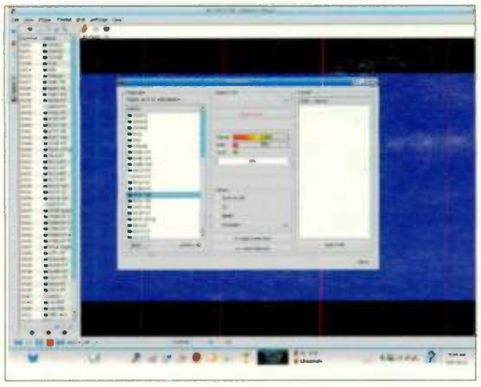
In the NAB presentation, LG showed how MPH data is interleaved into Reed-Solomon frames along with cross-interleaved error-correction bytes. Data is sent in bursts interleaved over one or more frames. This allows the system to handle error bursts up to 15 ms or longer if inter-frame interleaving is used. The MPH proposal also includes added training signals, but these were not described at NAB.

Look for more details here on the proposed ATSC M/H formats as more information is made public.

UPDATE ON PORTABLE ATSC RECEIVERS

In my recent reports on USB ATSC receivers, I noted that I hadn't been able to get any of them to fully function under Linux. I'm pleased to report that I now have the DVICO FusionHDTV5 USB Gold tuner successfully displaying ATSC and open cable QAM on my Kaffeine media player with the Xine engine and the HVR-950 displaying ATSC and analog TV. I noticed on AVS Forum there has been some progress made in getting the AutumnWave OnAir Creator to work under Linux, but firmware remains an issue with the OnAir GT.

Hauppauge's HVR-950 USB ATSC tuner uses hardware similar to that in the Pinnacle HDTV Stick Pro, which I've described before. I found the hardware performance matched that of the Pinnacle HDTV Pro Stick. Ron Hewitt's TSReader includes a driver for the HVR-950 and it works perfectly with it. For what it's worth, TSReader will display the SNR from the HVR-950 to three decimal places! The HVR-950 has become my main over-the-air and analog cable USB tuner because it works so well with Kaffeine for viewing off-air ATSC DTV and with the TVTime program



This screen shows the signal strength and SNR indicator as well as the channel list in the Kaffeine multimedia player running in Linux.

for viewing off-air or cable analog TV. Unfortunately, the HVR-950 doesn't demodulate cable QAM signals and the FusionHDTV5 USB Gold tuner won't display analog channels under Linux, so I have both receivers on my desk.

It is often easier to install devices in Linux than in Windows because the device drivers are included as "modules" in the Linux kernel and loaded as needed. However, in some cases, the kernel, the heart of the Linux system, may need to be updated to support DTV reception. I've had good luck with 2.6.21 and 2.6.22. I use Mepis (*www.mepis.org*), which is based on the free Ubuntu Linux distribution and is easy to keep up-to-date.

Install DVB/ATSC support as modules. Download "v4l-experimental" and install it in the new kernel. You will need to compile the software, but for most systems under Linux that's as easy as typing "make all" and "make install" in the v4l-experimental directory. You need to download the firmware for the FusionHDTV5, Pinnacle HD Pro Stick or the HVR-950 from the Internet. See the links for more information on installing v4l-experimental and firmware.

Scanning channels and building a channel list that Kaffeine or TVTime can use to tune the channels isn't as easy under Linux as it is with the manufacturers' programs under Windows. I won't go into the details here, but you will need to run "scan" to scan ATSC channels and generate a list of local stations and then use "atsc-converter" to convert it to a file in Kaffeine format. Just type "scan" at a shell prompt for instructions. I do a scan in each city I visit and save the list under a file name with the city as an extension. This makes it easy to get up and running as I move around the country. The scan program requires a list of frequencies to search. For the U.S., cable, NTSC and ATSC frequency files are usually in /usr/share/dvb/atsc.

Getting one of these receivers working under Linux is a great way to learn how the chips inside the receivers function.

All of this is more difficult to describe than to do. The Linus TV Web site, (*www.linuxtv.org*) is a good place to start. The Hauppauge and Pinnacle USB stick tuners, as well as some others, are covered in the EM2880 DevWiki at *http://mcentral.de/wiki/index.php/Em2880*. "Luna6" has detailed instructions and tips for the HVR-950 at *http://lunapark6.com/usb-hdtv-tuner-stick-for-windows-linux-hauppauge-wintv-hvr-950.html*. Also see *www.penlug.org/twiki/bin/view/Main/DigitalTelevisionDVB*. While it says "DVB," it covers ATSC reception on the pcHDTV HD3000. Drop me an e-mail if you run into problems. Getting one of these receivers working under Linux is a great way to learn how the chips inside the receivers function.

I should mention that AutumnWave responded to my request in a previous column for a larger signal strength display to make it easier to align antennas when using their tuners. The AutumnWave antenna aiming software even gives an aural indication of signal quality so you don't even have to look at the laptop or PC screen to peak the antenna!

Comments and questions are welcome. E-mail me at dlung@transmitter.com.

PRODUCTS & SERVICES SHOWCASE

PRODUCTS & SERVICES SHOWCASE

DIGITAL AUDIO CONSOLE

Yamaha DM2000 VCM Digital Audio Console

by Geoff Poister

The Yamaha DM2000 is a well-established audio production console familiar to those involved in the high-end professional production field. The DM2000 VCM is version 2 of the renowned console, and includes an upgraded software package plus an array of new effects. One of the most distinctive features is its ability to accurately recreate vintage analog effects from the '70s, effectively simulating classic compression, EQ, reverb and open-reel tape decks. All of this is achieved using the highest digital processing quality available: 24- to 32-bits at up to a 96 kHz sampling rate. In many ways, this is a digital mixing board that combines the best of what the older analog boards had to offer with sophisticated digital technology that greatly expands recording and processing capability.

FEATURES

The "VCM" in Yamaha DM2000 VCM stands for Virtual Circuitry Modeling, and it is one of the most notable features of the new version. This technology allows highly accurate digital emulation of analog circuitry. Although it may seem odd in the digital age, many sound designers and producers seek out the distinctive quality of certain vintage effects, such as reverb and chorus, that have qualities that were compromised when sound went digital. But unlike some methodologies that create inferior renditions of analog effects, VCM technology recreates the vintage analog characteristics with the highest possible processing power. The Yamaha DM2000 VCM performs its effects processing at 32-bit/96 kHz so that fine nuances are retained. The DM2000 VCM includes an entire library of effects and EQ settings that are all accessible internally, so there is no need to patch in external processors.

The Yamaha DM2000 VCM digital production console

FAST FACTS

Application
Digital audio mixing and effects creation

Key Features
Multiple effects for simulating older analog audio processing and recording technology

Price
$19,500 MSRP

Contact
Yamaha Corp. of America
714-522-9011
www.yamaha.com

The Yamaha DM2000 VCM also includes a new, original spatial sound effect system called iSSP (interactive Spatial Sound Processing). This delivers realistic sound source movement in an unlimited variety of spatial environments.

The DM2000 VCM incorporates a new advanced reverb method called REV-X, which offers much greater depth and more accurate decay, building on 24-bit 96 kHz processing power.

Weighing in at 95 pounds and sized at about 3x3x1-feet, the Yamaha DM2000 VCM is not meant to be a field recorder and is best placed in a studio setting. But it is designed to be a production tool that can handle any task and hosts a long list of basic and advanced features.

The console provides a mix of traditional physical faders and knobs and imbedded software to expand its capability. For example, there are 24 faders for controlling input sound levels. However, each fader can be assigned to handle four inputs effectively making it a 96-channel mixer. Channel faders can also be assigned to be auxiliary/matrix level controls. Their function is monitored on the unit's built-in LCD display panel.

Most of the other physical controls on the console can be assigned for different purposes, greatly expanding the amount of control.

On the rear panel, balanced XLR and TRS connectors are provided for all 24 inputs. Each input channel features independent balanced send and return jacks. For output, there are balanced analog studio, stereo, control room and monitor outputs as well as eight balanced bus outputs.

Most of what the DM2000 VCM has to offer is invisible, yet it accounts for the console's tremendous versatility. For example, the task of working with EQ, compression and effects to create an elaborate sound mix is very time consuming. Yamaha has streamlined this job by providing a preconfigured settings library. There are 61 factory presets for effects, 40 for EQ, 36 for compressor, and also settings in many other categories. These can be further customized and saved, allowing users to create their own libraries of frequently used settings.

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MULTIFORMAT CONVERTER

Edirol VC300HD Multiformat Converter

by Michael Hanish

It is amazing how much functionality is crammed into the single rackspace package of Edirol's new multiformat video and audio converter, the VC300HD. It up- and down-converts, scales, syncs and processes, with multiple simultaneous outputs active. This unit, while not totally unique in the marketplace, or 100 percent comprehensive, is a real breakthrough in price and performance—it's a problem solver in many ways.

FEATURES

As you can see in the rear panel photo accompanying this review, the VC300HD pretty much covers the waterfront in terms of video inputs and outputs. There's video I/O, which includes analog component (Y, PB, PR), HD-SDI, iLink (FireWire, for DV and HDV signals) and DVI-I. The DVI ports can handle analog and digital signals, which means they can be used for VGA (with an adaptor) and HDMI (with a conversion cable, though the output to HDMI through this port is without the embedded audio signal). Audio I/O is through balanced XLR connectors and unbalanced RCA jacks. Digital audio is present, embedded in the SDI and DV streams. The rear panel also contains reference in and out ports and a termination switch.

The Edirol VC300HD multiformat directional converter

The front panel contains a duplicate iLink port (however, only one can be used at a time), input, processing and output controls, sync reference indicators, a two-line LCD status and menu display, along with buttons and a knob for navigating and selecting operational parameters. There is also a panel lock button to prevent inadvertent parameter changes.

FAST FACTS

Application
Signal conversion

Key Features
All image processing is done at 4:4:4 and with 10-bit quality; the unit provides cropping, noise reduction, enhancement and aspect ratio conversion functionality

Price
$9,495 MSRP

Contact
Roland Systems Group
800-380-2580
www.edirol.com/vc

Format conversion and scaling are the main things the VC300HD does and does well. Input and output for-

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The new Yamaha DM2000 version 2 also includes presets for optimizing and conforming to standards for DVD and movie production. Furthermore, there are three presets that set up the system to conform to THX standards for DVD film, and music.

The console also comes with Studio Manager software for Mac and Windows. This allows the user to connect a computer interface for more graphically rich control of the consoles many internal functions. It can be used online for real-time control or offline to pre-configure the system before an actual recording session.

The DM2000 is designed to interface with Pro Tools and other workstations (like Nuendo, Logic and Pyramix), which greatly expands the recording possibilities. Using Pro Tools, one can take advantage of the full 96-channel recording capability of the mixer, as well as all of the additional effects and processing.

IN USE

My previous experience is mostly derived from work with older analog consoles and this is my frame of reference. The DM2000 has a familiar fader arrangement, but many of the other sections require a bit of re-education. The first thing I discovered is that this is not a console you simply plug in and begin to use. It has layers of capability, which take some time to learn, but the results are well worth the effort.

I was instantly impressed by the pristine quality of the sound. As soon as I connected a microphone, I was struck by the absence of noise. What you hear is only the sound you create against a backdrop of pure silence. Even with the fader up to the maximum, it remains clean and quiet.

The next thing I wanted to explore were the effects. I have always enjoyed experimenting with things such as chorus, reverb, phase and flange, but

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in the analog days this required banks of rack-mounted units that were very expensive. The great thing about the Yamaha DM2000 is that they are all built in and require no external devices or patching.

But they do require internal patching, and this is where I hit my first obstacle. The console, although elegantly designed, requires a fairly thorough understanding of the signal path and the way effects are routed and applied to make them work. I actually needed some help from tech support at this stage to figure things out. But they were quite helpful and I was soon on my way.

Once I was able to set up the board to apply and monitor the effects, it was a fascinating exercise to listen to them. By going to the Effects Library on the LCD screen menu, it is a simple and instantaneous process to sample each effect. Furthermore, each effect can be edited using a wide range of controls. And the quality is as good as it gets. Again, I was highly impressed by the purity of the signal. In the Effects Library, you can access a long list of analog style effects with pristine digital quality: truly the best of both worlds. I found the reverb, chorus, phase shifting and all of the 61 presets to be fabulous in quality and control. There is even an open-reel tape deck simulator that emulates the characteristics of reel-to-reel tape at 15 or 30 inches per second on new or old tape. Now there's an unusual feature for a digital console!

But the ability to shape the sound goes far beyond effects on the DM2000 VCM. The compression and EQ libraries offer significant and useful means for contouring the sound. There is also a physical EQ section on the board for creating settings that can be original or modifications of a preset. And individual EQ settings can be applied to each of the 96 channels on the board.

In the three days I spent with the console, I was just beginning to scratch the surface of its capability. And that doesn't even take into consideration the expansion capabilities. The DM2000 VCM accommodates a long list of input and output cards that extend the range of what may be attached to the system. One accessory I would instantly recommend, though, is the Peak Meter Bridge, which provides traditional graphic metering on the top of the console. The LCD screen already has enough to do, and relying on it for metering as well is a bit taxing.

SUMMARY

The Yamaha DM2000 VCM is a tremendously versatile and capable digital console that combines the personality of the analog era with the purity and power of the digital age. Yamaha has made a heroic effort to remove the stark edge of digital audio and restore a warmer, more natural sound.

But the DM2000 VCM is not for the part-time hobbyist. This is a thoroughly professional console. It takes a serious effort to master the capabilities of the console, and a thorough background in audio production and engineering will reduce the learning curve significantly. The board is not as intuitive as simpler boards, and requires an understanding of audio technology and a commitment to learning more.

But once one becomes familiar with the console, the sound that it produces is astoundingly pure and versatile. And with layers of computer-enhanced capabilities, I can't think of a single job in the digital audio world this console wouldn't handle with grace and style.

Geoff Poister, Ph.D., is a member of the Film and Television faculty at Boston University and a regular contributor to TV Technology.

AUDIO MIXER

Renegade Blue|328 Mixer

by Ty Ford

Real estate is precious in an edit suite. For now, at least, the big foyers, wide hallways and showy suites of independent post-production facilities are out. Faster computers, cheaper storage and a wide array of less expensive, computer-based nonlinear editing and compositing systems have led to smaller square-foot, more economic operations. Less is more. When it works well, "in the box" is better.

Few TV station post-production operations glam it up for clients as much as independent facilities. Broadcasters, however, have their own issues, such as finding extra technical space needed to create the online versions of on-air programming. In most cases, audio takes a back seat. As a result, thoughts about what to do to improve audio fall by the wayside. Besides, in too many small rooms, the audio monitors aren't correctly positioned to do a proper mix and the ambient noise level is too high for critical listening. And, of course, there's simply not enough time.

FAST FACTS

Application
Production and postproduction audio mixer

Key Features
Footprint is a single square foot, 32 inputs, 16-channel mixer with SDI audio extractor option.

Price
$5,750 (base price); $6,425 with the AES module

Contact
Renegade Labs
530-273-7047
www.renegadelabs.com

FEATURES

The Renegade Labs people in Grass Valley, Calif., have a product to cope with these changing times. Blue|328 is less than 12-inches wide and deep, and just slightly more than 7 inches high at the meter bridge. It total its volume is less than a cubic foot. With the exception of a line-lump power supply with a latching connector, that's it. Its diminutive size gives the mixer an almost toy-like appearance.

This is not a toy.

Eight long-throw faders, a master fader, assignment buttons and rotary controls occupy the rather Spartan front panel. While the Blue|328 allows you to solo any audio input for scrutiny in the monitor speakers, there's also a handy headphone jack at the lower right corner of the front panel when you need to stick your face even deeper into the mix than the ambient noise in your edit suite will allow. Being able to hear what's going on so easily means you may actually be able to improve the audio instead of letting the little things go. The headphone amp has plenty of drive.

All rear panel audio connections are 75 ohm BNC, with the exception of 25-pin D-Sub connectors for monitor and spare program outputs and the locking power supply connector. Brightness and contrast rotary controls for the front-panel display are also discreetly mounted on the back panel.

The Renegade Blue|328 audio mixer

The four input slots on the rear accept either analog or digital input modules. There are two analog input modules—a 4-channel line level card with a D-Sub connector and a 6-channel card with two XLR connectors for mics (with phantom power) and a D-Sub connector to handle the four line level inputs. Included are 15-pin D-Sub connectors and harnesses. The three digital input cards (supporting 24-bit, 48 kHz, 96 kHz and 192 kHz) are: AES, AES with sample rate conversion (SRC), or SDI (Serial Digital Video with embedded audio). The auto-configuring SRC modules works nicely for importing digital audio direct from CD players and other digital audio sources. Internally, the audio is 64-bit floating point.

When fully packed, the Blue|328 accepts 32 inputs, mixing up to 16 (eight stereo sources) at a time. Each input can also be polarity reversed to straighten out problematic production audio. Any input can be routed to any of the eight standard program output busses. There are eight analog monitor outputs. Any combination of the eight busses can be selected for monitors or headphones. An additional set of eight analog or digital output channels is optional.

Video (NTSC/PAL/HDTV) and AES3id sync are provided, and the Blue|328 auto-detects SD and HD signals and bi- and tri-level sync. When both AES and video sync sources are connected to the Blue|328, the sync source is a menu choice. The sync connection does not loop through the unit.

Signal flow with the Blue|328 is very straightforward. From any of the 32 inputs, audio travels though a 32x16 matrix. The 16 outputs are then gain trimmed, with signals sent to the LCD input meters. Also in the path are delay, dynamics and EQ for each of the 16 channels. These channels are then mixable across eight outputs. All analog outputs are active and balanced.

For the experienced operator, this amount of control means you can process audio as it's going into your nonlinear system, correcting EQ and delay problems way upstream. The amount of

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mats are symmetrical. Through the iLink, analog component and SDI, they are 1080/59.94i, 1080/50i, 720/59.94p, 720/50p, 480/59.94i, 480/59.94p, 576/50p and 576/50i. Through the DVI connector, digital input formats go from 640x480 to 1600x1200, most at both 60 and 75Hz; analog inputs through the DVI connector are limited to 640x480, 800x600, and 1024x768. Output signals available through the DVI, analog and digital ports includes all of the above frame sizes and rates.

Internal processing options and controls cover the areas of scaling, cropping, aspect ratio conversion, positioning, limited image correction, and limited audio EQ. Internally, all image processing is done at 4:4:4 and 10-bit quality. Scaling, cropping, and aspect ratio conversion function pretty much as you would expect: you can convert 4:3 to 16:9 and vice versa, with all the necessary cropping, letterboxing and squeezing options. Output video can be magnified up to 200 percent or reduced by up to 50 percent. Horizontal and vertical position can be adjusted as well.

This one single rack space unit replaced several pieces of outboard gear: SDI converters, audio converter and a DV converter.

Image processing options through the VC300HD are on the minimal side. There are parameter adjustments for red, green and blue gain—each can be boosted up to 100 percent. There are also noise reduction and edge enhancement controls, basically blur and sharpening algorithms, that can be applied to the selected input signal.

Audio processing (sampling is done at 24-bits and at 48 kHz) is also minimal, but usable. Audio can be delayed by up to 15 frames, in milliseconds, to compensate for video processing delays, a very useful function. Audio EQ is a three-band system (low, mid and high are the designations), with provisions for up to 12 dB of cut or boost. Additional controls allow for sync source and timing adjustments, timecode generation (to be embedded in the selected output signal) and offset, timecode user bit settings and drop frame/nondropframe selection.

Operation of the VC300HD is very straightforward and simple. Front-panel buttons select input, processing, and output parameters, and a page buttons flips between parameter categories. A value knob allows you to dial in the parameter selection. Status and results are displayed on the easy-to-read LCD display (which can be easily adjusted for different contrast and brightness preferences).

IN USE

Integrating the VC300HD into my Media 100 HD system required very little effort. In fact, it was a breeze. This one single RU device replaced several pieces of outboard gear: SDI converters, audio converter and a DV converter. All of my cabling became centralized, as did the location of all the operating controls. All I/O selections were immediate and easy to accomplish. And parameters were easy to enter and verify, thanks to the value knob provided along with the clear status displays.

Format conversions, scaling and aspect ratio conversions all looked extremely good, both to the eye and on scopes. Processing quality is excellent. The noise reduction and edge enhancement features were generally helpful in moderate doses, but much of their ranges of adjustment yielded unusable results. I very much appreciated the fact that all of the outputs are simultaneously active. Not only did that simplify my cabling and monitoring set ups, but it also made it possible to do simultaneous format outputs, thus saving me a great deal of time in outputting the play performance edit with which I tested this unit. Another feature that I found especially handy was the DVI input, as it allowed me to convert computer signals directly to video, another great time saving feature. Yet another very nice feature is that the VC300HD can output video test patterns. These include 75 and 100 percent color bars, non-SMPTE, and crosshatch) and 1 kHz audio test tones (at -20 dB, -10 dB, and 0 dB).

There were a couple of features I found myself looking for, but when considering the wealth of possibilities this unit offers, they are not deal breakers. First, there is no support for 24 fps video, a feature becoming increasingly important in the level of production this unit is aimed at. Granted that dealing with frame rate conversions to and from 24 fps adds a level of complexity, but it is a format that more and more production houses are using. Video processing controls, while clean and functional, are minimal, limited to just red, green and blue boost. Audio EQ controls are similarly limited to three non-adjustable bands. Both of these areas are generally compensated for by the auto-config feature, which performs automatic regulation on the selected input. However, more specific controls would be very welcome.

SUMMARY

This unit is excellent value and a very solid performer. The manual is very clearly written and straightforward, a most welcomed feature these days (but one that is all too often neglected). Users who don't have quite the budget or feature set requirements for the VC300HD should consider Edirol's VC200HD. It has the same feature set (minus SDI ins and outs) and is available at the lower price of $6,995. Overall, the VC300HD would be a welcome and cost effective addition to any production or post-production set up. Its wide feature set, flexibility, clean output and simultaneously active outputs make it very good value. Its design makes it easy and effective to use.

Michael Hanish runs Free Lunch, a video/audio/multimedia production house near Guilford, Vt. He may be contacted at michael@freelunchmedia.com.

TRAFFIC REPORTING

Beat the Traffic Real-Time Traffic System

by Joey Gill

They say a picture is worth a thousand words. Television certainly has embraced that philosophy over the years. Now, it seems there's a graphical display for almost everything.

I don't think that anyone would dispute the fact that on the whole, television graphics allow viewers to grasp general concepts much quicker than either text or the spoken word could convey. In newscasts, the integration of graphics has been gaining momentum for decades. First there were art cards and film slides. Then, these images were given movement. Some of us may remember "weather in motion" and it's animated weather map symbols for rain, high pressure and the like. Later, such devices as the Ampex ADO allowed us to add movement to any video. Random movement was "artsy," and spruced up the show, but it didn't really didn't help convey a message or allow viewers to grasp information at a faster rate. The industry needed the ability to put tailored images on the screen, and to be able to have them move in a predetermined manner—motion graphics.

One of the earliest and most widely accepted uses for motion graphics was their use in TV weather forecasting. That application forever changed the meteorologist's ability to inform viewers about the weather, with easy to interpret moving images and symbols. Since that first application, motion graphics technology has swept through the television industry and has gained wide spread acceptance in every aspect of television news production.

Today, most travelers seem to be interested in two main topics: what is the weather going to be like, and is there anything going on that may cause a delay in my journey?

While modern television stations are well versed at providing the weather information, they often struggle when it comes to providing motion graphics for viewers about traffic flow. Beat the Traffic is a company that has combined the latest motion graphics technology, 3D terrain mapping, streets and highway mapping, along with real-time Web-based traffic data. The result is a high-end 3D graphic mapping system with motion graphics. In addition, wrecks, fires, construction, detours, and slow-downs are illustrated on an easy to read road map.

Beat the Traffic's on-screen traffic reporting graphics for Phoenix

FEATURES

Beat the Traffic is a software-based product that provides a graphic, real-time display for alerting viewers to traffic and emergency situations using a variety of Internet data services. Some of these services are free, while others are subscription based.

In addition to using external data, manual operation of the unit is easily accomplished.

The application is very intuitive. There are six primary tabs on the PC screen. The first tab, "Eyepoints," is a drop-down list that displays every item that can be laid over the base map of your region. These items may be points that you've created, or custom landmarks created by Beat The Traffic for your locality. Beside each item, there is a box to check for displaying that item displayed on the screen. In addition, the check mark allows the item to be "flown-to" when using the sequence function. This is the way you create the structure of your presentation. Estimated travel times can be displayed on the screen as well.

The next tab is "Traffic." This drop-down list has all of the streets and highways labeled and ready to be

BEAT THE TRAFFIC, PAGE 50

FAST FACTS

Application
3D traffic reporting graphics

Key Features
3D graphics, custom maps, real-time data

Price
Varies with television market size.

Contact
Beat the Traffic/Triangle Software LLC
408-879-5824
www.beatthetraffic.com

EYE ON TRANSMITTERS

How Do You Keep 'Em Cool?

by James E. O'Neal

Cooling has been an issue and a challenge for engineers practically ever since Marconi built his first transmitter in the late 1800s. After all, there's no such thing as a 100 percent efficient means of converting power line electricity into radio frequency energy. Virtually anything that doesn't go up the transmission line to be radiated out into free space by the antenna is heat.

When the first vacuum tubes appeared, it was not possible to cool them with water, as construction was all glass, and in this arena, low temperature expansion glasses were still somewhat developmental. This greatly limited the power output of early transmitters. However, the push was on for constructing higher power transmitters and vacuum tube technology took a quantum leap when Western Electric's William Housekeeper developed his technique for sealing copper to glass. With this technology, the tube's anode could be immersed directly in a cooling stream of water. This invention handily solved the issue of removing copious amounts of heat from transmitting tubes.

TELEVISION ARRIVES

When television arrived on the scene, such water-cooled tubes quickly found their way into the transmitters being designed for the new service.

One of the most notorious of these was the RCA 8D21, which required cooling of anode, grid and filament seals. Very few transmitter installations ever got all of the cooling connections completely leak-free and the only way to operate for any length of time was by placing absorbent material under the water connections.

Primary pure water cooling loop used with an Axcera Visionary MSDC IOT transmitter

Fortunately, the 8D21 soon took its place in history and air-cooled tetrodes became the norm for television transmitters for a while.

In the late '50s and early '60s, the push for more power and better ways of generating it at UHF frequencies brought the multicavity power klystron into television transmitter architecture. Due to tube efficiency and construction, water-cooling was once again mandatory.

Other cooling technologies for RF power generation were also developed and are worthy of examination.

One of these was vapor phase cooling. The phase involved in this methodology refers to the change in coolant from liquid to a vapor.

What this boils down to (really unforgivable pun here) in transmitter cooling is that instead of just flowing water around the anode or collector structure of tube, the water is allowed to flash directly to steam. Proponents of vapor phase cooling have claimed up to 10 times better heat removal. Names ranging from "steam cooling" to "hypervapotron" were used to describe this particular methodology.

About the time that vapor phase cooling was in vogue, there began to be a shift away from using pure deionized water to an ethylene glycol/water mix in some applications. Actually, this is what automotive engineers had been using for quite some time. In both automobile engines and TV transmitters, corrosion and freezing problems are mitigated to a large degree with the use of a suitable mixture.

Another technology that has been developed in recent times is the use of special oils developed with high dielectric strength and low flammability characteristics.

Even with the fine tuning of liquid cooling technologies, manufacturers have not broken completely with air cooling.

With this as preface, is there any one "best" cooling technology to consider for your next transmitter?

A survey of some of the major players in television transmitter manufacturing seems to indicate that there is not.

"We do offer both air and liquid cooling for our IOT transmitters," said Richard Schwartz, vice president of marketing and product management for Axcera. "Actually, we're one of the few manufacturers that offer air-cooled IOTs; not too many people offer this."

Schwartz says that proper selection of a cooling system depends a lot on the transmitter site.

"In some places it's just inconvenient to do liquid cooling; on the other hand in the south the outside air may be too hot, or in some locations too salty," he said. "Probably 75 to 80 percent of our orders are for liquid-cooled transmitters."

OIL OR WATER

If heat removal with deionized water or a glycol/water mix works so well, why is there a market for dielectric oil cooling?

There are several factors involved in such a choice, but it basically amounts to the fact that some tubes offer better performance when high-tension areas are surrounded by oil rather than by water.

Brett Jenkins, U.S. product line manager for television transmitters at Grass Valley, says his company gives customers a choice, depending upon the output tube selected.

"With tube transmitters, the IOT is the tube of choice and standard IOTs have been out for almost 20 years," Jenkins said. "They use a water/glycol mix.

"The newer tubes—the high efficiency multiple stage depressed collector types—are available in two versions. One uses dielectric oil as a coolant and the other uses deionized water."

Jenkins said that his company tries not to steer transmitter buyers either way.

"It's their choice, but customers historically have chosen oil as the preferred method of cooling," Jenkins said. "We think that this is due to a variety of reasons—oil is gentler on the tube in terms of corrosion (water can be very corrosive) and with oil, system maintenance is simpler as oil doesn't break down over time and doesn't have to be monitored like water."

Jenkins reports that with the MSC IOT technology, his company's end users just haven't requested water cooling.

"The customers that we've dealt with have said oil is better."

WHAT ABOUT SOLID STATE?

Many manufacturers provide customers with a choice—at least in certain power ranges—of both tube and solid-state output stages. Although users of mainstream application transistor and chip technology usually don't associate liquid cooling with semiconductors, it is a way of life in transmitters.

"Both air- and liquid-cooling is used," said Martyn Horspool, television product manager at Harris Corp. "In general there is a fair amount of overlap—some power levels can be offered in both. It's a matter of customer preference, and as we develop newer products, we've seen a trend develop for liquid cooling. At 5 kW and above for analog (service) and at 1 kW for digital (service) liquid cooling is quite common."

Grass Valley's Jenkins indicates that liquid cooling for solid-state rigs is probably better.

"You tend to extend the life of the transistor with liquid cooling—we see that as the main advantage to liquid cooling of solid-state transmitters," Jenkins said."

This is also echoed by Rich Sweitzer, project manager and self-described "transmitter guru" at Rohde & Schwarz.

"Liquid cooling provides a more stable semiconductor junction temperature and less thermal shock," said Sweitzer. "Another advantage of liquid-cooling

transistors is that we can add a heat exchanger and move most of the heat load outside the building without depending upon building air conditioning. This drastically reduces air conditioning requirements."

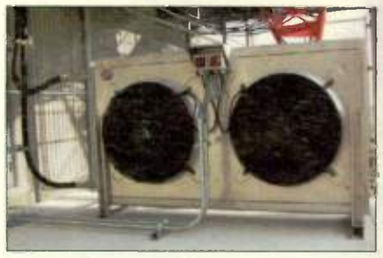
As with any liquid-based cooling system, leakage is a problem and most, if not all generally available solid-state devices, do not come equipped with liquid cooling ports, as do some of their high-powered vacuum-state brethren. This is a special concern with television transmitters, as most are built around multiple "bricks" or individual power modules that can be removed and replaced while the transmitter is operational. Transmitter design engineers were quick to work out "fool-proof" valving systems to seal off coolant lines when modules have to be pulled.

"Hot-swappable liquid-cooled modules are pretty much an industry standard now," said Tom Newman, executive vice president at DMT USA. "It's not really an old technology, but in this business it better be a standard feature."

OTHER CONSIDERATIONS

In deciding on a best cooling methodology, what are some of the other things to consider?

As a starter, a liquid cooling system is generally quite a bit more complex and requires more floor space. There's the heat exchanger, where a flow of air removes heat from the liquid being circulated and there are the necessary pumps and associated plumbing for moving the coolant in and out of the transmitter. Freeze-ups are another consideration in cold-weather areas and in general rule out a pure deionized water coolant. Use of a water/glycol mix is a way of getting around this problem, but care must be taken to keep the coolant clean and to make sure that the ratio of glycol to water is maintained. Periodic system flushes and coolant replacement are maintenance items usually associated with this sort of coolant.



Outdoor heat exchanger used with Rohde & Schwarz liquid-cooled transmitters

"Like anything mechanical or electrical, you've got to maintain it," said Andy Whiteside, vice president of engineering at Acrodyne. "This means monitoring the condition of your coolant—they're all sorts of kits available from glycol suppliers. Assuming that you've got the right mix, you still have to monitor this over time. You check that the pH is in the right range and check for reserve alkalinity in the right range. The coolant can quickly turn into an acidic mixture and if this happens copper can be stripped from the pipes and the collector of the tube, and then be deposited where you don't want it."

Whiteside says that oil cooling poses some challenges too.

"Oil is no longer pure once it runs through a cooling system. It picks up metals and other impurities and may no longer be biodegradable."

In either case (glycol or oil), cleanup after a leak or spill is more difficult than when pure water is the coolant. And aside from messy cleanup, there are also environmental issues associated with any sizeable amount of oil or ethylene glycol. This has led some manufacturers to search for other coolants. DMT's Newman says that his company doesn't use ordinary ethylene glycol.

"It's an environmentally safe coolant called 'Temper T-30' made in Sweden," said Newman. "We buy an awful lot of it. It's pre-mixed and you can ship it anywhere. It's used in ice skating rinks and also in the food industry."

Air cooling eliminates any such issues, and has another advantage too. Air cooling systems are usually tolerant of minor leaks. With good design, even a moderate leak will not take the transmitter off the air.

Air cooling does have its share of negatives though. One of these is noise. Moving a large volume of air is always going to be noisy. This may be a big factor if your transmitter site is staffed. Also, air cooling systems are not exactly maintenance free. There are filters to be changed or cleaned on a regular basis, bearings to be lubricated and belts to be inspected and replaced. (It's rather difficult to explain to the boss that you were off the air for a couple of hours due to a clogged air filter.) And no matter how good the filtering is, an air-cooled transmitter tends to be dirtier than its water-cooled counterpart. This could be a factor when contamination of ceramic and other insulating surfaces matters.

IT'S ALL UP TO YOU

Admittedly, transmitter cooling systems are not glamour items, but they are very important. It's estimated that as much as 15 percent of a transmitter's purchase price involves cooling system components. Also, during a transmitter's service life, a very sizeable amount of money is going to be expended in operating and maintaining its cooling system. It pays to study all of the options up front and then make the best choice for your particular set of requirements. ■

Beat the Traffic

CONTINUED FROM PAGE 47

check marked for either displaying or not. This allows ease of selection, and can help you keep your graphic uncluttered.

With the "Labels" tab, you can create your own labels, quickly and easily.

The "Video" tab provides control of the video, buffer selection, and allows TGA frames (Targa files) to be exported.

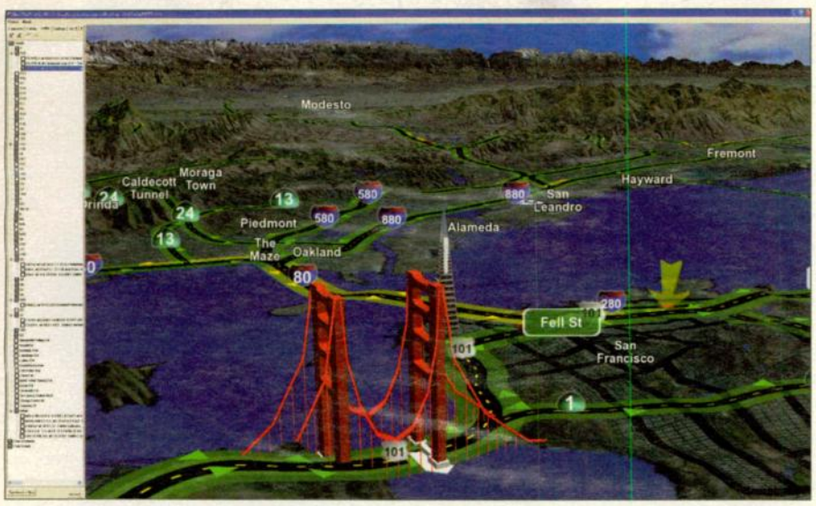
The "Settings" tab is probably the most intimidating screen, as it's where you must initially type in all of the URLs to receive the data for speeds, incidents, exits, travel times, speed signs and car models. In addition, you can select preferences, such as "show road surfaces," "show route signs," "show green for no data," "show place names" and the like.

The "Models" tab allows you to select terrain models and landmarks for display. Examples might include the Golden Gate Bridge, Ukiah Airport, or the Transamerica Building. Examples of terrain models are Bay Area Surface, San Francisco Streets and Santa Rosa Terrain (for the San Francisco area).

The PC supplied for testing was a Dell XPS 700, dual processor 2.4 GHz unit, with 2 GB of SDRAM installed. Video output was accomplished with a Chyron Digital PC Codi. In addition, drives were configured in a RAID 1 configuration.

IN USE

Like most graphics packages, the first step after the purchase is getting local maps and landmarks into the database.



Beat the Traffic's on-screen traffic reporting graphics for the San Francisco area

The Beat the Traffic sales team indicates that it can take several weeks and hundreds of man hours to create the local map package, which includes terrain profiles, streets, highways and local landmarks.

For this product review, I was supplied with the graphics packages for the San Francisco Bay area as well as the Phoenix area. That I'm located in Kentucky is of little consequence, due to the real-time data available on the Internet for nationwide access.

The Beat the Traffic workstation arrived with all software preloaded. After powering up the PC, and typing in a password, it was loaded and ready to go. I opened up the "Project" folder and loaded the one labeled "Phoenix." In a matter of seconds, a 3D map of Phoenix appeared on the screen. In addition to streets and highways, several local landmarks were displayed on the map as well. Among these were professional sports arenas, airports and other area major points of interest. The roads indicated on the map had a green line overlaying them. However, I did not see any traffic information displayed. This was due in part to the fact that I'd not yet connected our house LAN to the PC.

After connecting the PC to the house LAN, there was no change, so I embarked upon a review of the quick start instructions. I soon realized that I had failed to click the "Synchronize Now" button. When I clicked the sync button, the PC screen looked as if everything was rendering in fast motion. A few seconds later, the screen came alive! The existing green lines were now overlaid with animated arrows showing traffic flow. In addition, there were yellow sections of highway indicating traffic slowdowns and red sections indicating traffic had completely stopped. This was pretty exciting, as I was monitoring in real time the traffic situation in a major U.S. city from half way across the country!

As the graphics exists as a true 3D box, one can manipulate the view for all three axes. You can easily create pass-over and fly-around effects. However, the terrain models do not include photographic information, as Beat the Traffic first and foremost is intended as a traffic tool. The addition of photographic information would, in my opinion, most likely place much more demand on the processor while adding very little visual benefit.

After monitoring the traffic information from Phoenix for a couple of days, I loaded the project for "San Francisco." Due to the proximity of other highly populated communities, the San Francisco template contained a larger geographic area to be animated with real-time traffic information. Data connectivity was never an issue and always established itself in a timely manner when changing projects. Landmarks such as the Golden Gate Bridge, the Transamerica Building and several professional sports arenas were obvious and would help provide a sense of direction to someone familiar with the community.

I left the unit connected in my office over the next few days, with many visitors from around the station trying their hand at the application. Almost without exception, all were impressed with the ease of operation and the overall finished graphic product.

SUMMARY

As a broadcaster, one of the first questions that must be addressed when considering a product such as Beat the Traffic would be; is my market ready for such a tool? Highly populated communities are going to have more traffic data available for Web distribution than rural areas. At the Beat the Traffic Web site, there's a list of U.S. communities for which data is available.

For our hyphenated market here in Kentucky, we would not be able to use this traffic tool for just our immediate area. To make it feasible for us, we would need to report traffic from our four-state viewing area, using a combination of automated data from larger metro areas and manual input for our local, more rural areas. For potential adopters in larger markets, Beat the Traffic is a very powerful graphics tool for news. And reporting news is what our business is all about!

Joey Gill is chief engineer at television station WPSD in Paducah, Ky. He has been with the station for 25 years and has worked in broadcasting since 1977. He may be contacted at respond2jgill@yahoo.com.

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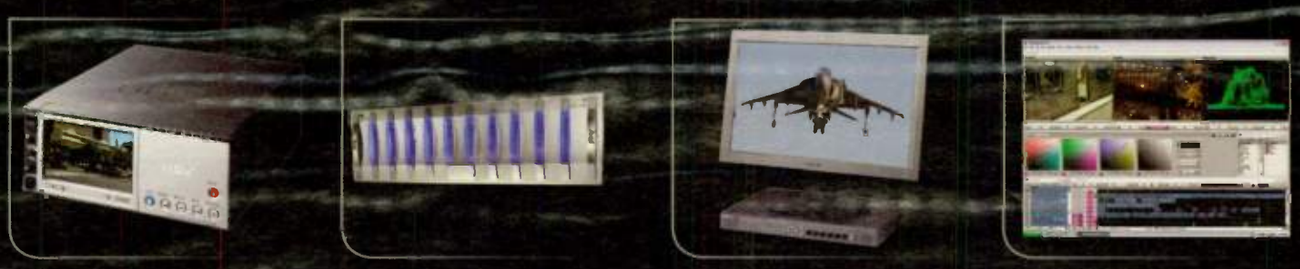

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Renagade

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delay is indirectly proportional to the sample rate of the audio. At 48 KHz the maximum is sixteen frames, eight frames at 96 kHz and four frames at 192 kHz—in tenth of a frame increments. Inputs can be ganged, applying delay across a group of tracks.

Renegade Labs earlier this year announced Version 2.0 software for the Blue|328 mixer. Version 2.0 adds support for SDI with the release of the new Model 304 8-channel SD/HD SDI input module. This new module extracts up to eight channels of audio from any of the four available groups. A simple user interface provides selection of the group of audio the mixer will extract and route to inputs.

Version 2 adds another 200 memory registers and naming register snapshots, and supports program, monitor, or meter outputs fed to the digital, analog, or optional outputs. Version 2 also adds up to eight channels of returns to the Blue|328, allowing a set of inputs to be designated as returns for monitoring conformance. This is an especially useful feature where a surround sound mix may be required and the operator may want to monitor the record returns for conformance. This works with Version 2 without having to tie up additional faders.

IN USE

To get a more "in the trenches" reaction to the Blue|328, I dropped it off with Senior Audio Engineer Bob Bragg and Facility Engineer Russ Jacobs at Producers Video in Baltimore. Producers Video is evolving their video technology upstream to HD, and has been using Graham-Patten DESAM mixers.

The Blue|328 was installed in one of their Avid suites. An SRC module was sent along afterwards and was quickly installed, due to the Blue|328's flip-open architecture.

Prepare to be under whelmed by the look of the Blue|328. It's not sexy, unless small and utilitarian is sexy to you. The Blue|328 took up less than half the space of Producers Video's existing audio mixer, but had enough dedicated controls to get the job done.

The controls feel solid and professional. The buttons switch noiselessly. BNC connections mean the mixer can easily be lashed to a video patch panel for audio routing. The Blue|328's ability to de-embed audio from an SDI stream was also a plus. No reinsertion module exists at the moment.

The three-band parametric EQ bands have notch filters and are configured for 20 Hz-1 kHz, 100 Hz-10 kHz and 1 kHz-20 kHz; +/- 12 dB. That's adequate for tweaking programs, but you'd probably want more for more serious mixing efforts.

The faders can be programmed as eight pairs of AES stereo audio or as eight individual channels. Presets each operator might use are easily created and stored. The volume knob is a little oversensitive in some parts of its range and a more linear taper might help. After removing the Blue|328 from its three week stay in a Producers Video's edit suite, Jacobs said one of the other video editors asked "where the good mixer went."

SUMMARY

The Blue|328 brings a lot to the table and in environments where both functionality and space are at a premium, and it doesn't take up much of that table. Your biggest problem will be dealing with people who think it's cute.

(I should note too that Renegade labs has reduced the Blue|328 recently to get the base model price to $5,750, with an a la carte approach to the various input modules. Digital and analog outputs, and all processing are still included. Input modules are optional. If you need the AES module only, the price becomes $6,425, a savings of $325 from the old list price.)

Ty Ford is on special assignment from ***Radio World*** *and* ***Pro Audio Review.*** *He may be contacted at* www.tyford.com.

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Engineering Operations Supervisor: KGO is seeking a highly motivated individual who enjoys working with new technology and is extremely detail-oriented for the station's On Air operations. The position entails scheduling and supervising union personnel, hiring, training, budgeting and evaluating department personnel. The ideal candidate will require solid organizational, communication and interpersonal skills. He/she must also be able to deliver within tight deadlines. Supervisor works in close coordination with other departments to provide the broadcast and production services that are needed to maintain overall program continuity for multiple On Air streams. Minimum job requirements are: Working knowledge of SDTV and HDTV equipment including Master Control and Production Automation; Familiarity with all broadcast related FCC rules, regulations and operating standards; Three (3) to five (5) years broadcast operations or related field experience; College degree; Supervisory experience; Valid California driver's license; Ability to occasionally lift up to 40 lbs.; Proof of authorization to work in the United States; Background check clearance. Open until filled. To apply for the position, please log on to: www.disneycareers.com and search for job title -Engineering Operations Supervisor, create a candidate profile and upload your resume file. No phone calls accepted. KGO-TV, an owned station of ABC, Inc., is an Equal Opportunity Employer.

KULR-8 seeking Chief Engineer. Position is responsible for transmitter and studio operations, distribution system including translators, information systems, plant and technical maintenance, and building facilities. Oversight of personnel currently includes a staff of 8 FT and 6 PT employees. Other responsibilities include management of the department operational and capital expenditure budget. Accreditation should include college degree or equivalent experience with FCC First Class, General License, or SBE certification. Terrific opportunity with all the glory of Big Sky country in Montana. Cover letter and resume to General Manager KULR-8, 2045 Overland Ave., Billings, MT 59102. bcummings@kulr.com. EOE.

Raycom Media, one of the nations largest broadcasting groups, with many stations located in the Southeast, is reviewing Chief Engineer resumes for consideration for future positions. The Chief Engineer has the responsibility for studio and transmitter operations, technical maintenance, building facilities and information systems. The position is also responsible for departmental operating and capital budget preparation. This is a very hands on position. You must be able to identify problems and repair equipment for both the studio and transmitter operation. Your background should include a minimum of 3 to 5 years experience. Microwave, transmitter, building, information systems and website knowledge and planning are essential. Send resume and salary requirements to: chiefengineer@raycommedia.com. EOE/MFDV.

CHIEF ENGINEER: WTOL-TV, Raycom Media's CBS affiliate located in Toledo, OH is interested in reviewing resumes for consideration for the position of Chief Engineer. The Chief Engineer is a departmental management position and has the responsibility and authority over all studio operations, technical maintenance, and information systems. Demonstrated experience in a competitive News market is essential. The position entails hiring, training, and evaluating dept. personnel. Also resp.for departmental operating and capital budget preparation and review. Your background should include a minimum of 7 to 10 years experience. Microwave, transmitter, building, and information systems planning and management knowledge is essential. You should have a minimum of two years technical schooling with a preference for an ASEE or BSEE. Send resume and salary requirements to: chiefengineerwtol@raycommedia.com EOE/MFHV.

STS is currently accepting resumes for KU satellite truck operators. C-Band, and ENG, experience a plus. Must have excellent driving record and references. Job requires flexible on-call schedule, which includes nights/weekends, overtime and travel. Please email your letter and resume to sts@mc.net or fax to (815) 728-1208. No phone calls please. Check out our website: stslivetv.com.

Vice-President – Technology & Broadcasting: KCPT in Kansas City, MO seeks VP of Technology & Broadcasting. Position will oversee the architectural design & implementation of the operational transformation into digital technology, automation & multi-channel broadcasting. Position reports to CEO & will be responsible for leading & managing the engineering, production services & IT depts. Successful candidates will have an undergraduate degree in engineering or related field, min 10 yrs television exp in technologies or eng field, including a min 5 yrs leadership/management exp, 3 to 5 years computer & network related systems mgt exp, an extensive understanding & knowledge of all FCC broadcast requirements & exc verbal & written communication skills. PTFP grant writing exp a plus. Job description at www.kcpt.org. Send resume with salary requirements to: Human Resources, KCPT, 125 E. 31st Street, KCMO 64108. EOE.

WBTW TV 13 is seeking a Maintenance Engineer for our new Myrtle Beach, SC facility. Join our winning team of Engineers and Technology Specialist to bring our new facility online! Minimum experience – Three year's maintenance and repair of all broadcast equipment. Dominant station (CBS). Details: http://jobs.mediageneral.com/jobsearch.asp Select job: BTW-000200 EOE M/F/D/V.

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Avid Restructures, Cuts Staff

TEWKSBURY, MASS.

Avid Technology Inc. said it is laying off about 150 staffers in the process of restructuring the company.

Avid is transitioning its video server engineering group from Mountain View, Calif. to existing facilities in Edmonton, Alberta and Tewksbury, and reducing space within certain facilities. The company said the realignment would result in restructuring charges of about $8 million to $10 million.

The company, which released its second quarter results in late July, posted a $6 million net loss on revenues of $225 million, compared to $222 million for the same period last year.

The news follows a recent announcement that David Krall would step down as president, CEO and board member at the end of July. Nancy Hawthorne, current board member and former chairman, will serve as Avid's interim CEO as the board searches for Krall's replacement.

The company also appointed Joel Legon to serve as its vice president and chief financial officer. Since joining Avid in March 2006, Legon has served as vice president and corporate controller.

Wexler Video Names New Vice President

BURBANK, CALIF.

Wexler Video has appointed Don Rohrer II to the position of vice president of the company's Broadcast IT division.

Rohrer will be in charge of promotion and sales of Wexler's IT products and services for the broadcast market.

Chris Thompson, president of Wexler Video, said that Rohrer was the ideal candidate for the position.

"During his tenure as vice president of sales here at Wexler, Don demonstrated a talent for driving sales growth and increasing market share," Thompson said.

In addition to his tenure as Wexler's vice president of sales, Rohrer has also served as director of the company's Nonlinear Services division. Before joining Wexler Video, Rohrer held senior sales executive and senior support positions at 3 Point Digital.

Motorola to Purchase Leapstone Systems

SCHAUMBURG, ILL.

Motorola Inc. is buying privately held Leapstone Systems Inc. for an undisclosed amount.

The acquisition of the Somerset, N.J.-based communications software developer complements Motorola's recent purchase of several companies aimed at end-to-end video delivery for multiple architectures, the company said. The other companies include Modulus Video, Broadbus and Tut Systems.

Leapstone brings to the mix a unified platform for managing content and delivering converged video, voice and data service bundles across multiple networks and devices. Leapstone's flagship CCE (Communications Convergence Engine) product suite is a real-time service delivery platform that enables fixed and mobile network operators to expand their service offerings through its software products.

Sean Matthews, senior director of strategy for Motorola said Leapstone will give its customers a tool that will enable a converged service platform for creating packaging to deploy and manage a fleet of quad play services, which is voice, video, data and mobile.

"A lot of it is about allowing our service provider customers to move from their legacy silo-based infrastructure to provide more of this seamless mobility and the experiences that can be enabled by allowing users to cross over those different silos," Matthews said.

The transaction is expected to be completed in Q3.

Riedel Acquires Mediornet

BURBANK, CALIF.

Riedel Communications, a German-based provider of comms systems for broadcast and production, has acquired Mediornet, a developer of multimedia network technologies in Vienna, Austria. Financial terms were not released.

Mediornet has developed a real-time routing network for transmitting audio, video, control and data over fiber-optic cable and has already been deployed in several projects.

"With Mediornet we have a new product, which ideally supplements our portfolio," said Thomas Riedel, managing director of Riedel Communications GmbH. "The acquisition strengthens our development expertise in the field optical video and multimedia networks."

Sennheiser Starts New Global Division

WEDEMARK, GERMANY

Sennheiser GmbH & Co. has created a new corporate entity to support its international customers.

The Sennheiser Global Relations division will be headed up by Director Greg Beebe, who has been with the company since 1992. Mick Whelan has been named as Global Support Manager, and has more than 35 years of experience in live sound applications.

Three relations managers make up the balance of the new unit. They include Kristy Jo Winkler, who has been Sennheiser's Artist Relations Manager for the past five years. She will be based in Washington, D.C. Mark Saunders has been placed in charge of Sennheiser's interests in Europe, the Middle East, Africa and India. He has been with Sennheiser for seven years and has also served the company as an Artist Relations Manager. Saunders will be based in the United Kingdom. Vince Tan has been given responsibility for Sennheiser's Asia and Australia trade territories. He is based in Singapore and has been with the company for eight years as a product manager and sales engineer.

Completing the new team is Maryam Lanki-Bavi, who holds the position of team assistant and will be based at Sennheiser's German headquarters.

In making the announcement about the new Global Relations division, Sennheiser President of Global Marketing Susanne Seidel said that the company was striving to "go the extra mile" for its customers.

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