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Spectrum Battle Heats Up

First responders need bandwidth for comms

by John Merli

WASHINGTON

First responders identified the need for additional spectrum more than a decade ago, following the Oklahoma City bombing. More recently, the 9/11 Commission also noted the need to reallocate spectrum in the 700 MHz band to improve first responder interoperability and enhance homeland security.

Despite various legislative attempts to open the 700 MHz band to first responders, broadcasters continue to use it for the digital transition. Now, the fight to reallocate it is getting personal.

While reintroducing the SAVE LIVES Act, which would end analog transmissions by Jan. 1, 2009, Sen. John McCain (R-Ariz.) blamed the NAB for allegedly stalling the spectrum turnover longer than necessary.

Mary Fetchet, a 9/11 activist who lost her adult son at the World Trade Centers, joined McCain. Both seemed to suggest that had the 700 MHz spectrum been available to first responders on Sept. 11, 2001, fewer lives would have been lost.

NAB Spokesman Dennis Wharton later told TV Technology, "it's quite a stretch to suggest that broadcasters had some responsibility for September 11th, and we would obviously take exception to any such thought. We had broadcast engineers die in that disaster.

"But we don't want people to wake up one day and see their weather alerts and news and other important coverage suddenly gone that

SPECTRUM, PAGE 12

Court Rules on Content

Supremes bounce Grokster; deny Brand X

by Deborah D. McAdams

WASHINGTON

The Supreme Court laid down the law on the Information Superhighway in two rulings last month that will affect how content is moved on the Internet.

The cable industry won big with the 6-3 Brand X decision, fending off third-party Internet service providers angling for forced access on cable systems. The movie and recording industries also scored in Grokster with a unanimous decision that put another layer of liability on purveyors of peer-to-peer file-sharing software.

Under current infringement standards, a secondary level of liability hinges on telling people how to use a technology to take copyrighted material. With the court rul-

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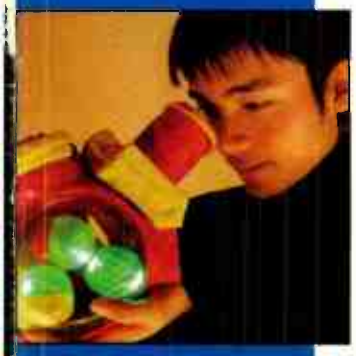

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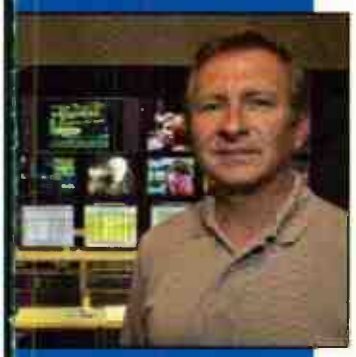

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Back to Reality

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Jay Ankeney

Focus on Editing

HDV was one of the hits at NAB2005. Now, as the dust is starting to settle, trying to survey the spectrum of how major editing manufacturers are tackling the challenge of posting that long-GOP (group of pictures) format is almost as daunting as squeezing... P. 28

Will Workman

Inside Broadband

I remember clearly the first time I saw the marriage of the Internet with a GUI (Mosaic), the first time I tried Napster and my first glimpse of TiVo. Each experience caused a tingle, an a-ha! moment in which one could peer down the evolutionary paths... P. 30

Digital TV

Charles W. Rhodes

The first television receivers were designed to receive BBC transmissions from the Crystal Palace transmitter in London. This was, incidentally 405-line all-electronic television, then regarded as HDTV by those who saw it. As there was only one transmitter... P. 38

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FROM THE EDITOR

A Taste of NAB

Several issues ago, we told you the story about the "Advanced Broadcast Solutions Technology Tour," a touring road show to showcase new products that were introduced at NAB2005.

That's not the only "post-NAB" roadshow, however. Retired engineer Larry Bloomfield called to remind us that his "Taste of NAB" traveling exhibit, now in its fourth year, has traveled practically the length and breadth of the country, bringing the latest in broadcast technology to markets as large as Philadelphia and as small as Bozeman, Mont.

The show, housed in a Dodge Caravan, is sponsored by a dozen manufacturers and will hit approximately 72 venues before ending in October (for more information, visit his Web site, *www.tech-notes.tv*).

Larry sets up his itinerary well in advance, choosing locales based on invitations from SBE and SMPTE chapters. This year, the van includes a complete video server setup, an automation system, test and measurement equipment, and a low-power transmitter and translator. Although not a sponsor, the SBE has provided assistance at the events. Larry emphasizes that the tour is not connected to NAB, and that he tells his audience that there is "still no substitute for going to the convention to see the technology firsthand."

Larry will be covering more than 17,000 miles this year and although expenses are covered by the vendors, one thing he didn't anticipate was the effect that the recent spike in gas prices would have on the tour.

"I'm going to pretty much take it on the short side right now, but I'm committed to doing it and I'm going to do it," he said.

That kind of commitment can be hard to find these days. We salute Larry for a job well done.

Tom Butts
Editor
tbutts@imaspub.com

Correction

A story in the June 6 issue inaccurately stated that NBC was fined by the FCC for indecency in the broadcast of the Golden Globe Awards in 2003. In fact, the FCC found the broadcast indecent, but did not assess a fine.

In the June 6 issue, information on Bittree in the Video Patch Panels Reference Guide was incorrect. The correction is listed in an updated guide below.

LETTERS

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

'We are Going Nowhere'

Dear Mario,

I think you really messed up in your reply to the "Letters to the Editor" section in the July 6 issue of **TV Technology**. You cited Voom's demise as proof that there is little consumer interest in HDTV. I would refer you to Frank Beacham's article in the same issue, in which he states "since day one—no matter how good the technical attributes of a network—television has been driven by one thing: the quality of the programming." Exactly what programming did Voom carry? Would I "pay" to watch four hours of Voom every evening? No! Why? Because it did not carry the programming of the major networks.

Of course you can't put the whole blame on Voom. It's not their fault that the politicians would not allow them, or any satellite carrier, to provide the most popular consumer programming. There is plenty of blame to go around. The FCC, cable operators, Congress, manufacturers, TV stations, they all have a share. There are a lot of political issues dealing with distribution, but let's just stick to the technical side for the moment.

The FCC did not provide a clear migration path. Without standards, or with too many standards, we are going nowhere. Cable companies are not required to carry ATSC transmissions. Why mandate putting an ATSC tuner in a TV set? As you have noted before, 80 percent of American households subscribe to cable. For some reason, cable uses QAM instead of ATSC. There are a significant number of stations transmitting stunning pictures in ATSC, but the cable companies transport the signal on QAM. Now I have to rent a set top converter (from the cable company) in order to receive ATSC-originated HDTV for each set in my house. I even have to pay extra to get the HDTV signals. But right now it is the only choice I have if I want to receive the most popular programming. No I can't put an antenna on my roof; it's not going to happen. I'm too far from any large cities to use rabbit ears.

The manufacturers are stuck with the competing requirements related to the multitude of standards and the infrastructure. If you display an HDTV signal on a 4:3 TV, it looks small. It would have been nice if someone had decided whether the goal was to go digital or to go HDTV. A 32-inch TV, which looked huge in 4:3, now looks small since the picture is not very high at 16:9. You can do some things like stretching to fit the screen, but that makes the picture look awful. So in order to get the same number of square inches of picture, the consumer is forced to go to a bigger screen.

So now I bought a big screen to make the picture look good. But a bigger screen requires a higher definition picture. So what do the TV stations do? They transmit multiple channels, all in standard definition. Duh?? It's perfectly legal. How does that help the consumer? He has purchased a big screen TV to take advantage of the quality picture that is supposed to be provided by HDTV and is now disappointed in the quality. It doesn't look as good as the old NTSC picture. Everyone involved looks stupid.

Of course the average consumer does not know what the TV stations are doing since no one is watching HDTV off air. But someday consumers are going to look at this situation and once again conclude that all politicians and government employees are stupid and all TV businesses are just out to get them. They "might not have noticed" yet, but they will. Somebody better figure out a solution.

Donald E. Hawbaker
Chambersburg, Pa.

Mario replies:

Gee, except for a few minor points, you seem to agree with me more than disagree.

Your pal,
Mario

The following is correction of video patch panel information fron Bittree. Specifications and prices are supplied by the manufacturer and are subject to change without notice.

REFERENCE GUIDE

MANUFACTURER	MODEL	TYPE	DENSITY	BWIDTH	OPTIONS	SIZE	PRICE
Bittree 800-500-8142 *www.bittree.com*	B96T-1MWTHD	Digital Mini-Weco with monitor row	3x32	3GHz	Normalling, terminations, looping plugs	2RU	$1,321

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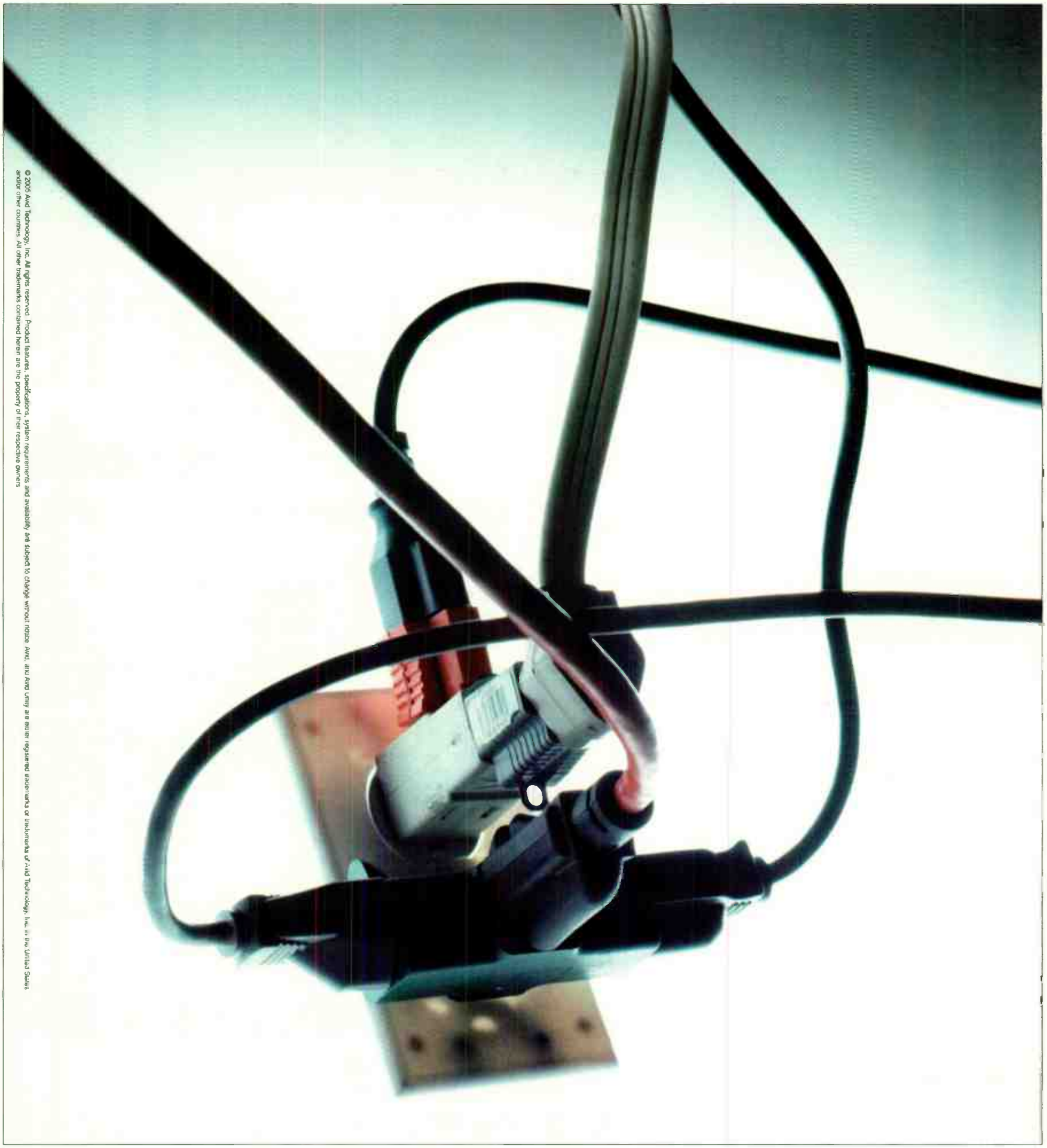

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Cable Expected to Be $47 Billion Industry by 2009

MONTEREY, CALIF.

With cash flow expected to increase at a 16.4 percent rate, revenues for the cable network industry could reach $47 billion by 2009, according to a recent survey by Kagan Research.

The financial consulting firm published the results in the 12th edition of "Economics of Basic Cable Networks."

The survey found that the cable industry has recovered from an advertising slump in 2001 and continues to attract investors. In 2004, the industry posted an estimated $9 billion in cash flow for the year.

In addition, the survey found that the 10 most widely carried networks averaged nearly 89 million subscribers in 2004 compared to 88 million the prior year. The estimated aggregate cash flow increase is expected to grow at 16.4 percent annually, increasing average cash flow from $10.4 billion in 2005 to $19.1 billion by 2009.

The survey tracks the sectors and profiles each network based on revenue, cash flow, programming expenses, TVHH growth and year-by-year, network-by-network benchmarks versus industry averages.

Kagan Research offers financial data and analysis, market advisories and five to 10-year projections on cable and DBS, broadcast television, digital, wireless and Internet technologies.

Cable

Microsoft, Toshiba Form HD-DVD Alliance

REDMOND, WASH. & TOKYO

With consumer electronics makers in the throes of another format war over the emerging HD-DVD standard, Microsoft and Toshiba have announced a plan to develop high-definition DVD players and software using Toshiba's HD-DVD format.

Microsoft CEO Bill Gates stopped short at calling the deal "exclusive," stressing that he wants HD-DVD to become more widespread.

The two companies have cooperated on the development of PCs and mobile devices for several years. In May, the two signed an agreement to cross-license technologies and work together to design the newest tablet PCs and smaller mobile PCs. The announcement in late June extended the agreement to HD-DVDs, specifically manufacturing HD-DVD players with Microsoft software.

Toshiba sees the deal as significant for next-generation HD-DVD discs—which are in a race for universal acceptance against the Blu-ray disc technology backed by Sony and Apple. Both formats, which could be available in less than a year, are incompatible with each other.

Blu-ray offers 50 GB capacity while HD-DVD can store up 30 GB of data.

HD-DVD

Canobeam Makes 'The Cut'

NEW YORK

CBS reality series, "The Cut" is using the Canon Canobeam to transmit a variety of RF signals throughout the skyscraper canyons of downtown Manhatten.

Broadcast companies use Canobeam to transmit digital video and other data between separate buildings for morning news broadcasts and for other data-networking tasks, according to Matt Battaglia, broadcast engineer and manager at the Wexler Technical Engineering and Design (TED) department for Wexler, the Southern California-based rental company that integrated the technology for the reality show.

Canobeam uses a beam of light to transmit video, so it does not require radio frequency allocation of licensing making shooting in the New York City location easier than with other products.

The proprietary auto-tracking function of the Canonbeam compensates for vibrations caused by traffic and wind.

The Wexler TED department integrated a pair of Canobeam DT-50/SDI units into an innovative solution that allows digital transmission of multiple camera feeds—tied with synchronized digital audio and time-code—from building to building.

"The Cut,"—hosted by fashion icon Tommy Hilfiger—is a rags-to-riches journey that pits style-savvy contestants against each other to test their business and social skills. The show premiered on June 9.

Reality & RF

Chinese Media Group Adopts Dolby Digital 5.1

SHANGHAI, CHINA

Shanghai Media Entertainment Group is helping China mark a milestone with its first TV channel featuring Dolby Digital 5.1 Surround Sound.

The media group debuted its service on its Orient Movie Channel at the Shanghai International Film and Television Festival on June 13.

Bill Jasper, Dolby Laboratories president was on hand at the event to offer his congratulations. He said Shanghai Media Entertainment Group has joined leading broadcasters in the world that provide Dolby Digital 5.1 surround sound to subscribers. SMEG Vice President Wang Wei noted the high percentage of home theater systems in Shanghai.

"Our viewers will definitely welcome this new 5.1 surround sound experience now offered through their digital television service," Wei said.

SMEG has been preparing for two years for the advent of surround sound broadcasting in China by training mixers to produce content in 5.1 and upgrading facilities to handle the new audio streams.

To showcase the Orient Movie Channel's new surround sound broadcast capability, SMEG set up 15 sites at the Shanghai International Film and Television Festival.

Digital Audio

Mitsubishi 1080p HDTV First to Market

IRVINE, CALIF.

Mitsubishi Digital Electronics America has delivered the industry's first consumer 1080p DLP HDTV to retailers in southern California and eager shoppers in the rest of the country can get the sets—built using TI's DLP technology—in a matter of weeks.

The company will also unveil three 73-inch models that will be available later this year in North America. In total, Mitsubishi will ship nine 1080p DLP models this summer and fall, ranging from 52- to 73-inch sizes. The MSRP of the 52-inch set—the first to market—is $3,699.

The new models feature Mitsubishi's proprietary 1080p DLP light engine with Dark Detailer for improved dark scene detail. The sets also use the company's exclusive Plush 1080p technology to upconvert all signals, including 1080i, to 1080p.

Max Wasinger, senior vice president of sales and marketing for Mitsubishi said the new sets represent a milestone in home theater.

Frank DeMartin, vice president of marketing for Mitsubishi said people who have seen the company's 1080p DLP HDTV sets have been amazed by the picture clarity, brightness and depth.

In addition, DeMartin said the new gaming consoles, Blu-ray/HD-DVD technologies and media center PCs will all offer HD content and the Mitsubishi 1080p DLP HDTVs are poised to take advantage of the latest HD content. The picture clarity will be limited to stored content, however as 1080-progressive programming via broadcast, cable or satellite is years away from reality.

HDTV

World Radio History

World's first HD Super SloMo camera system.

They say the camera is unflinching. But when covering high-definition sporting events, there's a lot of expressive scene detail that can go missing, not telling the viewer the entire story. Unless you're using a Grass Valley™ LDK 6200 HD Super SloMo digital camera system.

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Let's Get Real

How Bunim-Murray came to dominate reality TV production

by Claudia Kienzle

VAN NUYS, CALIF.

The hot genre of reality TV has proliferated to the point where there are now dozens of series where cameras capture the experiences of real people as they battle towards a monetary, professional, or personal goal.

Reality TV has become so commonplace that it's hard to imagine a world without it. But, there was no reality TV on the air until June 1992, when Bunim-Murray Productions created "The Real World" for MTV. "The Real World," which brings seven 20-somethings together in a house where they pursue a group challenge while cameras document their interpersonal fireworks—has since been renewed for its 16th season.

Bunim-Murray Productions of Van Nuys, Calif., has since produced many other hit reality TV shows, including "Road Rules" (20-somethings interacting on the road) for MTV; "The Simple Life" (featuring celebutant Paris Hilton) for Fox; "The Rebel Billionaire: Branson's Quest for the Best," on Fox; the syndicated show "Starting Over," distributed by NBC Universal Domestic Television; and "The Scholar" for ABC primetime.

"Reality TV has grown exponentially, especially over the last four years, to a point where today it seems to be a permanent part of the marketing mix of the network TV schedule across all dayparts," said Joey Carson, CEO of Bunim-Murray Productions. "We've had enormous success with unscripted programming."

A REALITY FACTORY

"While we're producing distinctly different types of reality TV shows, they all share a common challenge," said Mark Raudonis, vice president of post-production for Bunim-Murray Productions. "We need to edit down tons of unscripted video captured from real life situations in a way that best tells the story and creates a heightened sense of drama. It also has to hold the viewers' attention for that episode as well as the entire season."

"Of all the shows we produce, 'Starting Over' is the most daunting challenge because the production team shoots seven days a week, 12 to 15 hours a day, generating 30 to 50 hours of video per day," Raudonis said. "After box-loads of videotapes are delivered here and digitized, we have editors working in two shifts to whittle down the more than 200 hours of footage to produce each of five one-hour weekly shows—oftentimes with two weeks or less to our scheduled delivery to the network."

The cast of "The Real World," now in its 16th season

WINGING IT

Aimed at daytime's predominantly female audience, "Starting Over" follows the real-life drama experienced by a group of women who move into a house in Encino, Calif. At this house, multiple cameras—including Sony IMX camcorders and Sony PD170 DVCAM camcorders—capture whatever happens as the women work through personal problems, such as losing weight, childhood abuse, or money woes, with the help of skilled "life coaches," such as clinical psychologist Dr. Stan J. Katz.

"There isn't time for anyone to log or transcribe all this footage. Instead, we rely

REAL, PAGE 22

'Un-Real' Working Conditions

HOLLYWOOD

Calling reality TV working conditions "oppressive," Daniel Petrie, Jr., president of The Writers Guild of America, West (WGAw), announced on July 7 that his union has filed a class-action suit in the Superior Court of California on behalf of 12 reality TV story editors and story producers.

Among the issues that WGAw hopes to resolve are: disregard for state and federal overtime laws; lack of pension and healthcare coverage; and the need for minimum salary and compensation standards.

"The secret about reality TV isn't that it's scripted, which it is; the secret is that reality TV is a 21st century telecommunications industry sweatshop," Petrie said. "Today, these companies know they can have their employees working seven days a week because they are not constrained by having to pay overtime." For example, reality TV workers were asked to work an 84-hour work week for a flat weekly rate.

And, since these positions are freelance jobs lasting less than one year, Petrie said production companies have also not made provisions to provide them with any health insurance.

The lawsuit was brought against four production companies: Next Entertainment, Telepictures Productions, Syndicated Productions, Inc., and Dawn Syndicated Productions; as well as ABC, CBS, Turner Broadcasting System and the WB.

The suit charges them with failure to pay overtime, willful falsification or failure to maintain payroll records, and the chronic failure to afford meal periods required by law.

Writers filing the suit worked on such reality TV shows as "The Bachelor," "The Starlet," "The Two Timer" and "The Real Gilligan's Island."

While the WGAw doesn't normally represent TV editors and producers, in the case of reality TV, Petrie said these creatives are instrumental in telling the story by culling hundreds of hours of video into compelling storylines.

"Reality TV wants to preserve the illusion that this stuff is just happening, so virtually no one has the title 'writer,'" Petrie said. "They call them story producers or 'predi-tors'—producer/editors—but we recognize that they are essentially there to create the stories.

Daniel Petrie, Jr.

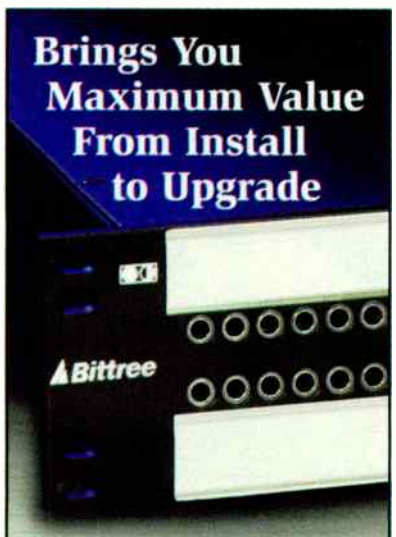
"Everyone I speak to who works in reality TV can't wait to get out of it, and get into traditional, scripted forms of entertainment because the working conditions are so bad," said Petrie. "Some production companies want to do right by their employees, but they don't want to be put at a competitive disadvantage against other companies that have a more exploitative attitude towards their workers."

On a lighter note, a faux-news blog by humorist Andy Borowitz reports that reality TV producers are facing a severe shortage of real people to feature in their shows.

Referring to a bogus study commissioned by the University of Minnesota's Reality Institute, Borowitz jokes that "85 percent of Americans have either gotten married, competed for a modeling contract, or eaten bug larva on TV," and that finding fresh contestants has become a daunting task.

In reality, producers may soon discover that finding qualified, talented people to work behind the scenes on reality TV shows may become an equally daunting task if qualified workers continue to leave the industry or the WGAw resorts to a strike.

Claudia Kienzle



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Small Truck Makes Big HD Impact

Clear Channel's new hi-def truck takes advantage of advances in compact gear

by Craig Johnston

LITTLE ROCK, ARK.

Continued advances in downsized equipment played a leading role in allowing Clear Channel HD Mobile to roll out a full-featured 32-foot entertainment mobile truck this spring.

"Ten years ago, there would have been no way to get the capability I have in a truck this size," said Clear Channel HD Mobile Chief Engineer Alan Finne. He pointed to the terminal gear rack as an example.

"I've got a Miranda DA frame with 10 cross-converter cards in there taking up two RU of rack, and that rack could have been completely full of conversion gear, top to bottom, even two or three years ago."

The company is targeting the emerging demand for HD in entertainment venue recording.

"Quality is a huge issue for entertainment, especially for something that's then going to be turned into a DVD for home release, so the best way to do that is in HD," said Clear Channel HD Mobile General Manager William Mitchell.

And for servicing that market, size does matter. "[We] did the selection based on the need for a smaller truck for use at the 'House of Blues' or a comedy show, stuff that tends to be downtown, in small areas," Finne said. "You want something that's easy to get into an alley."

Operating costs were another consideration. The company inherited the 53-foot HD truck originally built for Monday Night Football's first year in HD. "The thing was just a behemoth, costly to get down the road," Mitchell said. "The maintenance and repairs on the thing were costly."

For his target, Mitchell said this truck is the right size. "You can get all essential personnel, that being a tape operator, a video operator, an engineer, an audio engineer, a producer, a director and a technical director, and then have space for maybe two more people."

Clear Channel's new truck sports eight Sony HDC-750 1080i cameras, and ten Sony HDCAM recorders.

"Our typical show goes seven to eight iso feeds, and a line cut, so we've got eight HDWS280s; it's a new product for them, a half rack unit VTR," Finne said.

"This is a small truck and we're carrying a lot of stuff."
—Alan Finne, Clear Channel

Clear Channel's new 32-foot HD mobile production truck features Ross Video switchers.

Two Sony HDWS-2000s are used to record the line cut and backup line cut.

For switching and routing, Clear Channel went to Ross Video. "I went up to Iroquois and sat down with David Ross and talked to him about the things we needed the switcher to do," Finne said, "and right then and there we went in and looked at one of the switchers they had in their lab."

"For the price-point and the capabilities of the switcher, it was just hands down the winner." He bought one from the Ross MDX series. "I've actually got switcher number one off their line, and all the guys there in their lab and R&D department signed the chassis with a Sharpie, which is kind of cool."

For routers, Finne went with a 64-square HD router from the Australian firm Talia, marketed in North America by Ross.

"I had not heard of this router before, but they assured me it would act the way that I would expect it to do, and it has performed wonderfully. Plus the price-point was very attractive," he said.

For video monitoring, space considerations dictated LCD monitors in the production suite, though in the video/engineer-in-charge area, they opted for Sony color CRTs.

"I just felt that there should be glass monitors that give you a really, really true pristine look at what's going on," he said.

Audio is an important consideration for a truck specializing in entertainment, concerts and such.

"We have a Yamaha 48-input PM5D switcher and Dolby encoding gear," Finne said. "That was a request from the entertainment side of our company, and it was relatively easy to put in place."

Regarding graphics, Mitchell said, "graphics in this truck is handled on a case-by-case method. For the shows that we've targeted and have been asked to do by the entertainment side of our company, graphics are handled in post."

With that in mind, however, Finne has a wiring harness and patching and routing provisions for a CG.

"As an engineer I wanted to cover my bases," he said.

SURPRISE HEAT SOURCE

With any project such as the Clear Channel HD truck, Mitchell and Finne had some surprises.

"There's the perennial weight issue," Finne said. "This is a small truck and we're carrying a lot of stuff. Here's an example: I've got eight cameras and 10,000 feet of fiber in various lengths. If you hit a bigger show, even SMPTE fiber, as light as it is, that stuff mounts up."

Finne had anticipated heat buildup being an issue with the densely packed equipment in the truck, but it didn't come from the terminal gear as he had expected.

"It turns out that the terminal gear runs very, very cool—everything, the Ross switcher, the Miranda gear, the Talia router."

They discovered that the buildup came from the VTR rack.

"I actually had to go back and retrofit more air to that rack," he said. "It was a 'gotcha,' but not one that was unrecoverable. It was more of a 'wow, that was interesting, it wasn't what I expected.'"

Clear Channel's new HD truck has already been hard at work handling the opening ceremonies at this year's Kentucky Derby. And they've done the remote pickup on Clear Channel's "Tom Joyner Sky Show," which Mitchell describes as "a sort of radio for TV variety show."

He has no illusions about the new truck being tapped to do a Super Bowl.

"That's not what we're about. We're just more along the lines of taking care of our corporate partners and also having a truck available out there on the market that targets the small to medium size shows," he said. "It didn't seem to us there were many trucks out there that were that size. We believe it's a niche and one we can fill successfully."■

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Spectrum

CONTINUED FROM PAGE 1

millions of people rely on every day, and, in some cases, rely on to save their lives," Wharton said.

With respect to broadcast television, Congress should really focus on the "big picture," said Greg Schmidt, vice president for New Development and general counsel at LIN Television, which owns 23 stations.

"I would like [Sen. McCain] to view broadcasters as a potentially viable digital broadband competitor that he could well snuff out if he isn't careful," he said.

And while proponents of a faster transition argue that "only 15 percent" of homes still rely solely on antennas, Schmidt sees the same numbers as a plus.

"In most industries, a competitor that has 15 percent of the market would be a competitor the government would work hard to protect."

SMART NET

In at least one market in the country, broadcasting is not in complete diametric opposition to the needs of first responders. In 2003, New York City public broadcaster Thirteen/WNET began laying the considerable groundwork for a unique digital wireless emergency alert system for the nation's largest market.

WNET began its project, which has some federal funding, with the idea that licensed spectrum could be used for two-way wireless communications for public safety. The station also realized its Educational Broadband Service allocation was under-utilized.

"I would like [Sen. McCain] to view broadcasters as a potentially viable digital broadband competitor that he could well snuff out if he isn't careful."

—Greg Schmidt, LIN Television

Using Smart Dissemination Networks (Smart Nets), WNET has already completed two, one-year phases that began in June 2003 (Broadcast Model/Phase 1 and Cellular Model/Phase 2). The station is now into Phase 3 with GUARD (Geospatially Aware Urban Approaches to Responding to Disasters).

"The test bed spectrum for all Smart Nets and GUARD activities will continue to be our 16 MHz EBS channel allocation," according to Stephen Carrol Cahnmann, the station's director of digital convergence. "Our Smart Nets proved that public safety commanders could transmit critical data to our master control, where it was routed through the station's primary digital downlink transmitter at the Empire State Building and then beamed to a special receiver connected to a laptop at a fixed location in the field," he said.

"Video and data from this fixed location was then beamed back to Thirteen's master control using 'in-band return path'—filtering out many of the downstream carriers in the COFDM signal and using those carriers for upstream transport," he said.

Phase I was a limited success.

"It proved that two-way communications on a single TV channel can be accomplished, but it required direct and unfettered line-of-sight transmissions to a fixed location," Cahnmann said.

Phase II, using a cellular approach, added mobility using WiMAX-ready equipment. But Cahnmann added that mobility alone is not sufficient.

"Wireless mobile communications, particularly in the canyons of Manhattan's skyscrapers, require that signals be successfully received non-line-of-site so police cars and fire trucks can pass behind buildings and through tunnels without losing the ability to send and receive," he said. Initial implementation of the system is scheduled for next spring.

FIRST RESPONDER GEAR

Meanwhile, Motorola and other major manufacturers of basic public safety communication equipment, such as two-way radios, are testing new devices for use in the 700 MHz band. A similar scenario previously arose for equipment in the 800 MHz band, for which some jurisdictions around the nation are still paying.

Stuart Overby, director of Global Spectrum and Standards Strategy for Motorola, said the proximity of the 700 band to the 800 band is a key factor supporting the expansion of interoperable voice networks—and the addition of data and video. It also allows for the use of many of the same tower sites and other infrastructure to keep costs down.

"Prior to the 700 MHz band, spectrum allocations were often too far removed from existing frequency bands to allow coverage of both frequency ranges in one radio," Overby said. "Motorola already provides mobile and portable voice radios that span both the 700 and 800 MHz bands. And 700 MHz is the only spectrum the FCC has identified to support mission-critical, wide area, high-speed data and video. The availability of the 700 MHz band is actually a tool to help improve interoperability." ■

Spectrum Coordination Requires Nationwide Action

The problems plaguing public safety communications involve operability and interoperability. Additional spectrum will resolve operability, but plain old human cooperation is the only way to iron out interoperability.

Just about every jurisdiction has its own way of dealing with emergencies, from who says what in the mayor's office to how information is disseminated among first responders, said Alan Caldwell, senior advisor of the International Association of Fire Chiefs. Nonetheless, without additional spectrum, the coordination issues cannot be resolved. Public safety officials nationwide use bits and pieces of bandwidth across the RF spectrum, meaning many radios may not work across county lines, or even outside of city limits.

In a report from the Congressional Research Service, Analyst Linda K. Moore writes, "The immediate barrier to achieving radio communications interoperability is—simply put—that UHF and VHF frequencies cannot connect directly with each other; and older analog equipment widely used below 512 MHz cannot connect with newer digital equipment at 800 MHz."

Currently about 97 MHz of bandwidth is designated to public safety, and those channels are full, Caldwell said. The FCC designated another 4.5 MHz in the 800 band—enough for around 90 two-way channels—with the Nextel decision last December. That allocation is also nearly full, said Caldwell. He and a collection of lawmakers, public safety officials and 9/11 activists were on Capitol Hill recently to stress the dire need for the 24 MHz in the 700 band that was promised to first responders eight years ago.

Currently, 65 analog stations, 10 digital stations and 737 translators are functioning in those channels. Sen. John McCain (R-Ariz.) tried last year to free up those channels by the end of 2006, in an overall DTV bill that would have ended analog transmissions by the end of 2008. That bill was shot down, and while analog-sunset legislation currently circulating on the Hill doesn't include dual dates, Chip Pickering (R-Miss.), vice chairman of the House Commerce Committee, said he could support such an arrangement.

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Court

CONTINUED FROM PAGE 1

ing, the way a technology is developed and marketed can also be grounds for copyright violation.

"We hold that one who distributes a device *with the object* of promoting its use to infringe copyright, as shown by clear expression or other affirmative steps taken to foster infringement, is liable for the resulting acts of infringement by third parties," wrote Justice Souter, who delivered the opinion of the court.

Richard Taranto, an attorney with Farr & Taranto who represented Grokster, said the ruling opens the door for a raft of litigation.

"This is a very difficult roadmap to follow," he said. "We have a multifactored standard that you can't, in advance, be very sure how it will apply."

That will be up to the Ninth Circuit Court of Appeals in San Francisco, which ruled two years ago that Grokster was not liable for copyright infringement under the Betamax standard. In that case, the Supreme Court in 1984 found that selling copying equipment did not contribute to infringement. The ruling allowed VCRs into the market.

BETAMAX LIVES, BUT...

Gigi Sohn, president of Washington, D.C. think tank and Grokster advocate, Public Knowledge, said the ruling was positive in that it reaffirmed Betamax.

"A technology capable of non-infringing uses can be legal, and peer-to-peer can be capable of non-infringing use," she said.

Sohn said that punishment ought to be meted out to "infringers, not technology."

Record companies agreed.

The Recording Industry Association of America filed 784 copyright violation complaints against users of Grokster, Kazaa and Limeware just two days after the Supreme Court decision. All three entities distribute peer-to-peer file-sharing software on Web sites that include warnings about copyright infringement.

The suits were filed in federal district courts in California, Colorado, Georgia, Missouri, New Jersey, New York, Pennsylvania, Virginia and Washington, D.C.

"The Supreme Court provided a real shot in the arm to legitimate online music services and unanimously injected moral clarity into this debate," said Mitch Bainwol, chairman and CEO of the RIAA in a statement.

"We have a multifactored standard that you can't, in advance, be very sure how it will apply."

—Richard Taranto, Grokster attorney

"If there was any doubt left, there should now be none—individuals who download music without permission are breaking the law."

WHERE THE ISPs ARE

Mindful that a ruling against file sharing could spill over into more general use of the Internet, ISPs filed amicus briefs in the Grokster case. Mike Godwin of Public Knowledge and Ed Black, president and CEO of the Computer and Communications Industry Association, said that ISPs were indeed at risk under the new standard.

But Mark Cooper, director of research at the Consumer Federation of America, didn't think so.

"The issue involves the two parties and their particular behavior," Cooper said. "I don't see the necessary impact and implications, assuming the lower court gets it right. The lower courts will very quickly be able to cut through the industry smoke screen of dumping all kinds of new cases into the court system."

Brand X, on the other hand, is likely to have an impact beyond the parties involved in the lawsuit. In their ruling, the justices effectively upheld the FCC definition that cable modem service is a Title 1, or information service. As such, it's not subject to the same regulatory regime as a Title 2, or telecom service, such as phone lines. Under Title 2, telephone companies have to let competing ISPs offer service over DSL lines. Consequently, the decision means cable has an advantage over phone companies in the competition for broadband customers. Gene Kimmelman, head of the Consumers Union, said there would likely be some sympathy for the Bells, "given the broad chokehold cable has been allowed to preserve."

The cable lobby was quite pleased with the preservation of its chokehold, but not to the point of cheekiness toward the Bells, which are furiously laying fiber so they can break into the video biz.

"We view the Supreme Court decision as a victory for the consumer, because we already have red-hot competition for bringing broadband to consumers," said Kyle McSlarrow, president and CEO of the National Cable and Telecommunications Association.

If the Bells want more parity for DSL service, then so be it, he said.

"We're for more deregulation," McSlarrow said. "Like services should be treated alike. There's nothing I know of that indicates DSL is other than an information service."

Both the Bells and consumer groups that opposed Brand X will likely seek rectification from the FCC, where proceedings on cable modem and DSL services remain open.

In fact, representatives of the Telecommunications Industry Association popped into the FCC the day after the Brand X decision to visit with Jessica Rosenworcel, legal advisor to Commissioner Michael Copps.

"TIA urged that the commission maintain a path consistent with its earlier ruling that cable modem services, and broadband services in general, are information services," read the association's ex parte notice in the DSL proceeding file.

Cooper from the Consumer Federation said the only way around the Brand X decision would be for the FCC to establish 'Net neutrality in the DSL rulemaking. And while the FCC already decided against 'Net neutrality by making cable modems an info service, the FCC will have a new lineup when a wireline ruling goes down.

Sohn, from Public Knowledge, said the Brand X decision "points out the need for a 'Net neutrality principle in telecom law."

Lawmakers have been making noise about rewriting the '96 Telecom Act, but they're already halfway through the Congressional session without having established a long-promised DTV deadline. Sens. Ted Stevens, (R-Alaska), and Dan Inouye (D-Hawaii), Nos. 1 and 2 on the Senate Commerce Committee, issued a statement following the Supreme Court decisions.

"We are carefully reviewing the Brand X decision reached by the Supreme Court today," it said. "The decision... will have a number of complex policy implications for the communications industry and consumers.

"In that same light, we also look forward to reviewing the Court's decision in Grokster, and to considering its impact on efforts to stem the tide of digital piracy while promoting e-commerce and the Internet's lawful uses." ■

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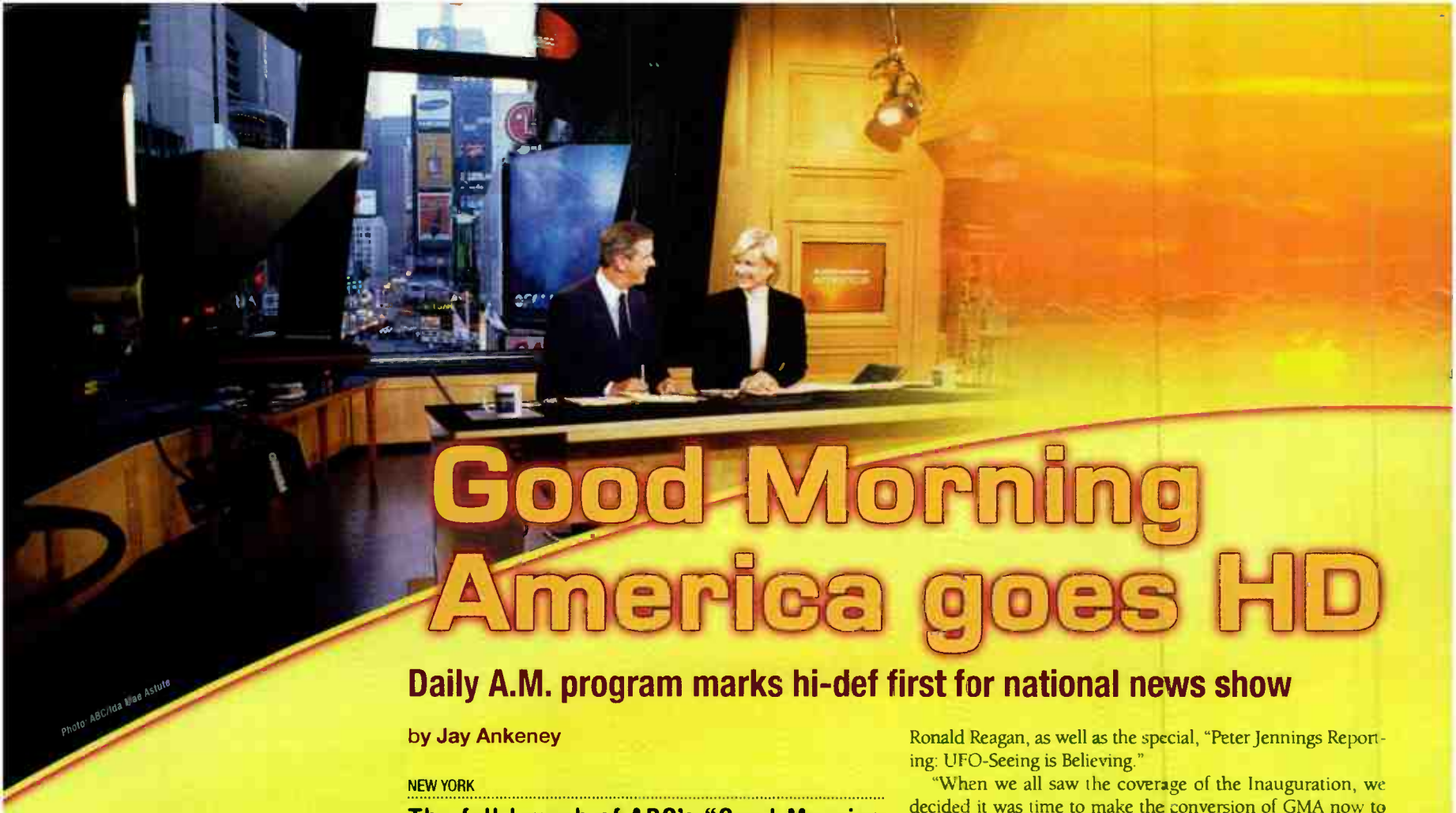

Photo: ABC/Ida Mae Astute

Good Morning America goes HD

Daily A.M. program marks hi-def first for national news show

by Jay Ankeney

NEW YORK

The fall launch of ABC's "Good Morning America" and its weekend edition in HD marks the first time a regularly scheduled commercial network news program will be produced in high definition.

"Anyone who has experienced high-definition television has been captivated by the quality and clarity of the images and sound," said ABC News President David Westin when the announcement was made on May 16. "HDTV will help us showcase the best and brightest team in morning television and deliver the very best experience to our audience."

HD INAUGURATION

This won't be the first time GMA's hosts, Charles Gibson and Diane Sawyer, have appeared in HD; a three-hour special high-definition broadcast on Inauguration Day appeared on the show. ABC News has also provided high-definition coverage of the last two State of the Union addresses and the funeral of former president Ronald Reagan, as well as the special, "Peter Jennings Reporting: UFO-Seeing is Believing."

"When we all saw the coverage of the Inauguration, we decided it was time to make the conversion of GMA now to HDTV," said John Green, a longtime producer of the morning show who helped launch the weekend edition of GMA earlier this year. "It really was astounding for us to see our own product in this new medium, and it convinced us that we had to offer this to our viewers sooner than later."

Now joined by new co-host Robin Roberts and weatherman Tony Perkins, Green said this advance in technology will expand the scope of the show.

"High definition brings you onto a location more than most television viewers are used to," Green said. "The scope of the 16:9 image is so much broader, it makes you feel as if you were in a movie theater right in your own living room. Even though most of our audience doesn't have HD sets yet, this may convince people who see us on a friend's set or in a store display to upgrade their own system to HDTV."

All of ABC's HDTV programming is broadcast in 720p high definition with most of that accompanied by 5.1 channel surround sound. ABC was the first major network to begin broadcasting in HD on Nov. 1, 1998 with the theatrical presentation of "The Wonderful World of Disney: 101 Dalmatians." The network also initiated live regularly scheduled HD sports broadcasts in primetime with the 1999-2000 season of "Monday Night Football."

In September 2001, ABC began broadcasting the majority of its primetime schedule in HD, including all of its scripted primetime comedy and drama series, as well as all theatri-

World Radio History

cal movies. During the 2003-04 season, the network broadcast more than 800 hours of HD content, and presented 441 hours of high-definition programming during the first five months of this year.

A MAJOR MILESTONE

But a regularly scheduled daily news production is a major milestone for the network.

"We see this as a natural extension of our primetime HDTV programming," said Preston Davis, president of Broadcast Operations and Engineering for ABC. "The plan is to have all of the studio elements both inside and outside our Times Square location in high definition right from the start. But because ABC News also acquires content from a broad range of suppliers, for the time being, much of their material will come to us in standard definition to be upconverted to HDTV as it is integrated into the program."

This may change as Davis predicts the new HDV recording format will play an increasingly larger role in GMA's remote productions. "We gather a fair amount of material today using small format DV cameras such as the PD-150 from Sony," he said, "so you will see a gradual replacement of those DV cameras into 720p HDV because we think it is a very suitable format for this early transition into high-definition television news."

The step up to HD will involve quite a bit of infrastructure change in ABC's primary complex at 47 W. 66th St., including the installation of a new Sony MVS-8000A high-definition switcher, a Sony HDS-X5800 router and nine Sony HDC-1500S studio cameras along with some handheld models to cover the crowds outside the Times Square studios.

During the technical changeover of its master control capabilities to HD, "Good Morning America" will bring in a 53-foot AMV Crossroads double expando mobile production truck to continue its standard-definition broadcasts.

"We have customized our remote truck to match ABC's studio requirements," said Eric Duke, president of New York-based All Mobile Video. "This includes a Sony MVS-8000 switcher so they can get familiar with the system they will ultimately use on a daily basis, and augmenting our existing Ikegami camera control units with the addition of Sony CCUs, so their camera crews can ease the transition to the equipment they will ultimately be using."

Initially the studio segments shot on the GMA set will have stereo audio, but the Friday Concert Series music segments will be produced in 5.1 surround.

"I think HDTV is a format that lends itself to stories that have a lot of visuals," producer Green said, "and while I think the editorial goals of the show will remain the same, this new technology will let our viewers get more of a feel of actually being on location. I think it is just going to make the competitive race for telling visual stories more intense and will encourage our directors to take our cameras outside more often to appreciate the depth and beauty of Times Square."

"When we all saw the coverage of the Inauguration, we decided it was time to make the conversion of GMA now to HDTV."

—John Green, GMA producer

The hosts, by the way, have been some of the biggest supporters of moving into HDTV. "Our anchors are unusually hip," Green said, "and in fact it was Diane Sawyer who had a Blackberry before any of the producers did."

The exact premiere date of "Good Morning America" in HD has not yet been announced. ■

World Radio History

Measuring the ASI Bitstream

The importance of monitoring throughout the MPEG signal chain

by Mary C. Gruszka

NEW YORK

Once a baseband HD or SD signal plus associated audio and data get converted into an ASI stream, it becomes necessary to use specialized measurement and analysis tools to ensure that the MPEG-2 stream and all its elements are present, in the correct location, and with the correct timing.

"With the set-top box being cheaper and cheaper and from an increasing number of manufacturers from all over the world, there will be some interoperability issues," said Stephane Billat, communication division application engineer for Sioux Falls, S.D.-based Sencore. "The only way for a broadcaster to feel confident about its DTV delivery is to provide a compliant transport stream." And that means testing.

Billat said that MPEG monitoring can be separated into three areas: syntax compliance of the MPEG-2 transport stream, template checking for the presence of audio and video services, PID (packet identifier), and customer-specific parameters like minimum bit rate for minimum quality purposes.

Observing an MPEG signal with a particular set-top box on a particular monitor or receiver doesn't guarantee that the viewer at home will have trouble-free reception. And observing only at the end of the signal chain doesn't guarantee success either. It's important to monitor at all points in the MPEG signal chain. These include satellite or fiber contribution feeds, video servers or tape-based devices producing MPEG streams, encoders, IRDs, any re-multiplexers, PSIP generators, data generators, modulation outputs, and cable TV output to the set-top box.

DIGITAL DEFECTS

What are some of the more common DTV defects?

Rich Chernock, director of technology for Triveni Digital in Princeton Junction, N.J., listed the ones he's observed the most: PSI/SI/PSIP tables missing, incorrectly formatted, incomplete and/or inconsistent; excessive jitter in PCR values; audio or video buffer underflow or overflow; audio or video program elements missing; and incorrect audio/video synchronization.

The causes of these defects range from initial setup and configuration; equipment drift; equipment failures; communication link failures; and loss of synchronization.

"Having the buffer off just a little bit is fairly common, and often a TV station won't know this is happening until they do the analysis," Chernock said. "This is usually related to the setup of the encoder."

The Pixelmetrix DVStation can monitor thousands of parameters within hundreds of digital television signals.

What happens if these defects are present? Chernock said that DTV receivers could have trouble tuning. There could be no information in the on-screen program guide. The picture or sound could break up or be absent, and there could be noticeable lip sync errors.

So to prevent these defects from occurring, what needs to be monitored?

"The simplest answer is to follow the ETSI TR 101 290 Measurement Guidelines that originated from DVB," said Dennis W Kucera, an MPEG applications engineer for Beaverton, Ore.-based Tektronix. These measure various parameters of the transport stream.

"Compliance to this guideline helps to ensure that set-top boxes will be able to receive the transmitted signal, accurately decode the video and audio, and access and make use of the embedded electronic program guide," Kucera said. "Set-top boxes are designed under the premise that these guidelines will be met and failure to comply could mean that a set-top box will fail to operate."

As TR 101 290 was developed for DVB, there are some ATSC-specific tests that this document doesn't address. To rectify this situation, ATSC recently established two subgroups that will provide recommendations on what to monitor in the ATSC realm, in a similar way as TR 101 290. The DVB document will be used as a starting point, with ATSC specific tests added.

The SEWG (The ATSC Implementation Subcommittee Systems Evaluation Working Group) has created a sub group called DTV Stream Monitoring Points and Parameters chaired by Billat. In addition, the TSG Ad Hoc Committee on ATSC Bitstream Verification, chaired by Chernock, "should explicitly describe the elements and parameters of A/53 and A/65 that must be verified in an ATSC Transport Stream for it to be considered a proper emission," according to its mission statement.

PRIORITY LEVELS

TR 101 290 is divided into three priority levels or groups: 1, 2, and 3.

The first priority includes parameters that are essential for the MPEG stream to be decoded properly.

These include transport stream sync loss, errors in sync byte, PAT (Program Association Table), PMT (Program Map Table), continuity count, and PID (packet identifier). Proposed ATSC parameter checks for priority 1 include MGT (Master Guide Table) and VCT (Virtual Channel Table) errors as well as PAT, PMT, MGT and VCT consistency errors. (The list of parameters for all three levels was supplied by Triveni Digital and Sencore.)

"The most important parameter of all is the MPEG-2 0x47 Packet Sync Byte which should always be present without error," Kucera said. "Secondly, the PAT and PMT tables must be present, because without these tables, most set-top boxes will fail to find anything to decode. ATSC adds to these tables with Program and System Information Protocol, which is a major requirement for ATSC set-top boxes, allowing them to identify and decode video and audio."

BITSTREAM, PAGE 21

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World Radio History

Not Just Another Pretty Font

HD graphics illustrate live shows and news

by Robin Berger

LOS ANGELES

Graphics producer Allan Wells finally found high-definition graphics technology that lets him do what needs to get done—Pinnacle Systems Deko 3000HD.

"We had to present the same show in high def that we presented in standard def," said Wells, whose company, Universal City, Calif.-based Fontastics, designed the graphics for the 2005 Grammy and Oscar awards broadcasts. "We were able to design all the graphics in HD using the Deko 3000HD, and played everything out from there."

The Deko 3000HD was also used on "American Idol," and Wells planned to use it on the nationally televised July 4th tribute, "The Capitol Fourth" on PBS.

In the process of getting to know the machinery, the crew also became aware of a number of bonus factors.

AUTOMATING GRAMMY GRAPHICS

The Grammy show in particular, said Wells, requires an enormous amount of information. Until this year, the Fontastics crew had to type it in manually.

"Simply not having to type 100 awards times five nominees' worth of information saved days in programming," Wells said. "You can import the Word document or cut and paste the text."

The Deko 3000HD's ability to import many different image files also enabled Fontastics to revamp its process for creating still frames of winners awarded before the telecast.

Fontastics used to use a mobile unit full of HD video equipment and fiber lines to record the winners; the graphics crew captured the still frames.

This year Fontastics simply hired a digital still photographer.

"We imported all the pictures we needed from this USB stick, and were able to build the sequence that way," Wells said. "The only person it involved was the graphics operator; it didn't involve the rest of our facilities at all."

Veteran operator Hugh Grew said three Deko 3000HDs were used in production: one for nominee and winner mattes; another for pre-tel winner bumpers; and a third for "faces in the crowd."

Like Wells, Grew appreciated the Deko-enabled liberation from the traditional pre-tel process. He also gave high marks to the reliability of the system, as well as its GUI, macros and layout.

"You don't have to use the mouse as much—your hands can be on the keyboard, which increases operator speed," he said. "You really get the sense that the Deko was built by character generator people, not cast off to some Windows-based, PC company."

The hardware's dual power supplies, ease of access (only three screws on top of the box), and portability also impressed Grew, who also found the removable hard drives a sweet alternative to an otherwise arduous copying process.

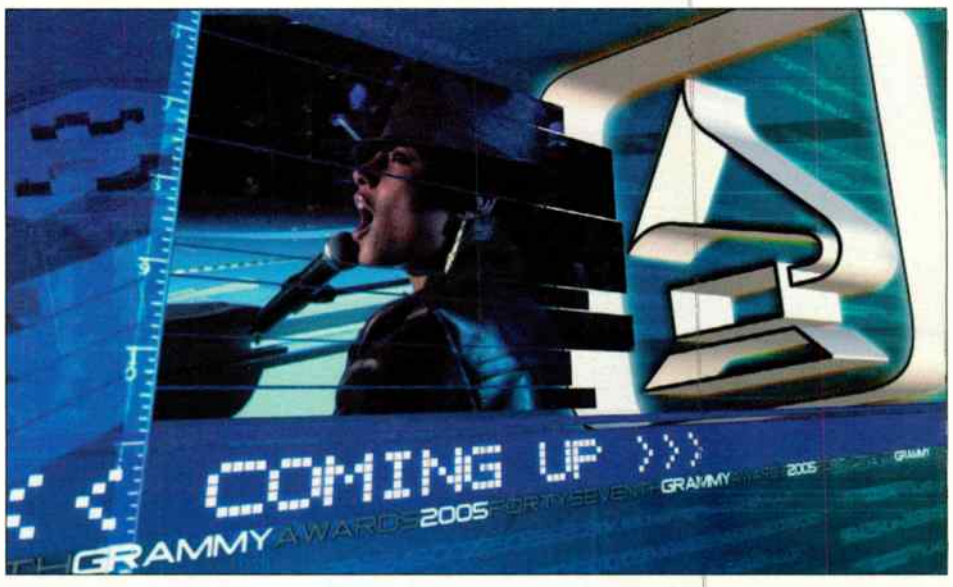
Instead of putting the graphics onto a DVD or a number of CDs, "you could actually just carry a hard drive to the show and slide it in and it's ready to go," Grew said. "Or if you have a lot of clip data, you could just have all your clips on a hard drive and just slide it into the Deko."

Grew's boss also appreciated the extras.

"The one thing I can't stress enough with this whole experience was just the support from Pinnacle—what won me over so much with them was the service," Wells said. "In each case, they had a spare system sitting there, waiting just in case we had any issues."

The only thing missing, Wells said, was an internal clip player.

According to Caren Anhder, Pinnacle director of product management—on-air graphics, the Deko 3000HD has a single stream of clip playback in the current base system. That basic functionality will soon be extended with the ClipDeko HD option.



A graphic showing Alicia Keyes, from the 2005 Grammys Awards designed by Fontistics

ClipDeko HD will be demonstrated at IBC2005 in Amsterdam in September, according to Anhder. Interoperable with existing and new HD systems (including the Deko Hybrid), it can simultaneously play back two clips, each with an associated moving key.

ClipDeko HD accommodates QuickTime and .mxf files, can record live input with key along with composited graphics, and has 3-point loop definition. It also embeds a link to a clip in a Deko graphic file so that "when a graphic is recalled, the clip will automatically play," Anhder said.

HD NEWS GRAPHICS

VOOM HD News broadcast native 1080i HD graphics starting in 2003, thanks to a setup designed by the Kenilworth, N.J.-based consultancy Diversified Systems Inc.

DSI Senior Project Engineer Phil Bernal said equipment choices were based mostly on familiarity to the operators. The basic components are the Thomson/Grass Valley Kalypso HD 2.5 M/E switcher, Pixel Power Clarity HD stillstore, VertigoX-media graphics automation system (which ties into the ENPS newsroom rundown system), and Vizrt character generators. Panasonic AJ-HD 1700 DVCPRO tape machines and a Grass Valley Profile Media XP 2000 round out the system, with Evertz products used for conversion.

"The VertigoXmedia system was the software that actually ties the system together," said Bernal. "It produced the graphics that showed up on the Clarity and on the Vizrt character generator. The producers inserted tags into the ENPS list that would tell the automated system, 'pull up this graphic in the still store.'"

When VOOM acquired its system, HD graphics technology was still in its infancy, and Vizrt was a forerunner, he said. Today, the contenders' products "pretty much stack up" against each other in terms of quality and capability, although there are some differences in regard to speed and integration.

"Vizrt is more 3D-oriented and more scene-oriented, whereas Chyron and Pinnacle are more template-based," Bernal said. "Vizrt is going to generate a lot more stuff live—go a lot faster—but you're going to pay for the processing power and capability."

To date, the broadcast industry has been slow to incorporate HD graphics, but Bernal believes that the half billion-dollar boost to ENG sales fostered by Nextel's spectrum relocation deal with the FCC could kick the interest up a notch.

"It will make it easier to go to HD because you'll have a digital infrastructure," he said, "which is going to help graphics and everything else." ■

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Bitstream

CONTINUED FROM PAGE 18

Kucera further explained the function and importance of the PAT and PID.

An MPEG-2 program uses time-division multiplexing to deliver video and audio over the same link. MPEG-2 also supports multiple programs on the same link. Both cases require the use of a PAT for describing the number of programs carried within the link, such as an ASI stream. Every MPEG-2 transport packet header carries a 13-bit parameter called a Packet Identifier. This PID parameter allows the receiver to differentiate all of the tables and elements. The PID allows for the unique identification of the PAT, each of the different video and audio elements, and the other MPEG-2 PSI tables, like PMT, as well as ATSC PSIP tables.

Level 2 priority lists recommended parameters that need to be monitored continuously or periodically. These are the ones that can affect overall program quality.

Repetition rates for many of these parameters must be within certain tolerances. For example, "if the repetition rate for PSIP is too slow, the tuning and channel surfing will be slow," Billat said.

Level 2 includes tests for errors in transport, CRC (Cyclic Redundancy Check), PCR (Program Clock Reference) jitter and discontinuity check, PTS (Presentation Time-Stamp), and CAT (Conditional Access Table). Proposed for ATSC are detection of the presence of EIT-0 to EIT-3 (Event Information Table) and checks missing required descriptors, RRT (Rating Region Table) if referred in the MGT, errors in the SST (System Time Table), and descriptor consistency error in the PMT and EIT-0 (for the current event), table syntax, PID, table type and version number.

"The CAT is the pointer to enable the IRD to find the EMMs (Entitlement Management Message) associated with the conditional access system that it uses," Billat said. "If the CAT is not present, the receiver is not able to receive management messages."

The third level of priority deals with application-specific data, such as audio and video buffer level and SI tables, Chernock said.

These include: buffer error, audio and video buffer underflow or overflow; un-referenced PIDs, and proposed for ATSC, errors in optional EITs from EIT-4 to EIT-127 if referred in MGT; plus errors in ETT if referred in MGT, A/90 datacasting table, as well as consistency errors among MGT, VCT, EIT and ETT.

BIZARRE BEHAVIOR

Inconsistency between tables can cause bizarre behavior in receivers. "Some will work fine, some will tune to somewhere else, and others don't work at all," Chernock said. These problems can be difficult to trace, which is why it's important to perform cross-table analysis.

In ATSC, some parameters need to appear in different tables. For example, the captioning service descriptor tells the set-top box what kind of captioning information is available to make decoding easier. This data is located in two places, the PMT and the EIT. If the two tables disagree, it's uncertain how a set-top box will react.

The tables also use pointers from one to another. For example, the Event Information Table, which carries the schedule, has a pointer from each event to the Extended Text Table that carries a description of the show. If the ETT doesn't exist, or if the information in it doesn't correspond to the event itself, that's a problem.

There's a wide variety of equipment available for performing ASI bitstream monitoring and analysis. These include the Streamscope analyzer (including cross-table analysis) from Triveni Digital, the TSM 1770 (monitor) and MSA 1850 (analyzer) from Sencore, the MTM400 and MTS400 from Tektronix, the Thales Mercury MPEG Analyzer and Garnet MPEG-2 handheld analyzer, DVStation from Pixelmetrix, and DVM 400 from Rohde & Schwarz.

The only way for a broadcaster to feel confident about its DTV delivery is to provide a compliant transport stream."

—Stephane Billat, Sencore

A good tip is to actually try out these analyzers. They make good learning tools on the inner workings of ATSC. Chernock, who travels around the country teaching seminars and tutorials, finds that when his students start to use the measurement tools, they begin to understand what all the various tables do and how they interrelate to each other.

The nomenclature and all the acronyms can be confusing, so a visit to the ATSC Web site at *www.atsc.org* to download and read the standards, would be time well spent.

And if there is still any doubt about the need to monitor, Chernock can dispel that. "Why monitor? Because you really want to find out the problem before the viewers do." And before they start calling with complaints. ■

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Real

CONTINUED FROM PAGE 8

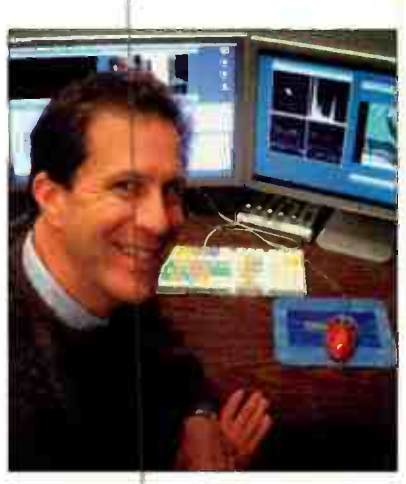
upon outlines from our story producers who sum up for us the key events that happened during production and the main storylines that are emerging, and we base our creative editorial decisions upon their direction," Raudonis said.

"The number of producers, editors, story coordinators, and other production personnel that we have on staff varies depending on how many shows we have in production simultaneously," Carson said. "We have dozens of suites that may be in use at any one time."

During the hiatus between season two and three of "Starting Over," Bunim-Murray Productions uses Apple Final Cut Pro Version 5.0, on Apple Mac G5 dual 2.0 processors, because it offers a new multicam mode for editing the footage captured by multiple cameras simultaneously. The company also wired its entire two-story post facility with CAT-6 Ethernet cable, to give its staff of 50 editors real-time editing performance; as well as give non-editors (such as those in the story, legal, and music departments) the opportunity to browse low-res proxies of all of the footage in (Apple XSAN) shared storage from their Apple iMac workstations.

REAL SOUND

Another great technical challenge at Bunim-Murray is obtaining and maintaining all the different formats of video playback equipment they use for their various shows. For example, "The Real World" shoots on the Sony IMX (MPEG-2) format at 29.97; and the newest show, "The Scholar," on ABC primetime, shoots on the Sony (disc-based) XDCAM at 30 fps progressive. ("The Scholar" features a group of high school seniors competing in academic challenges for a $250,000 scholarship covering all expenses of attending a top university).



Mark Raudonis, vice president of post production for Bunim-Murray Productions

"The Rebel Billionaire" was shot on Sony HDCAM at 1080/30p and aired in high def.

In addition to viewing multiple camera takes of every scene, the action also has been captured by a variety of microphones, including new RF mics from Zaxcom that incorporate disk-based recording right on the belt-pack worn by each of the "cast members."

"Since our cast members are not professional actors, they often forget about technical considerations, such as the tiny microphones clipped near their necks or on their chest. If they play with jewelry, thump their chest, or hug each other, they often cause the audio pick-up from their microphones to be inaudible," Raudonis said. "As a backup, we also follow the action with a boom mic."

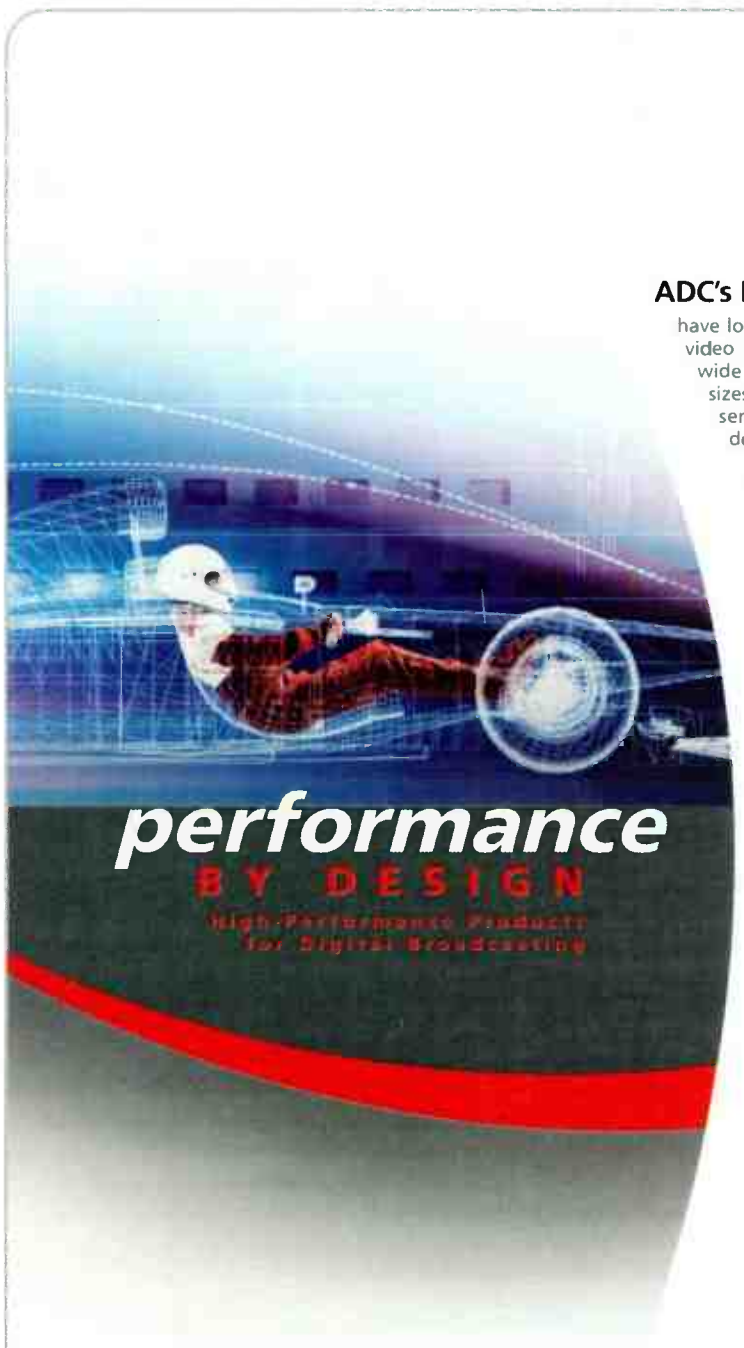
For some shows, discreet channels of audio are recorded separately onto an eight-channel Tascam DA88/DA98 digital audio recorder.

A SOCIAL EXPERIMENT

Now in its third season, "Starting Over" recently won a daytime Emmy for "Outstanding Special Class Series." Raudonis referred to "Starting Over" as a "S-Oprah" because it's like a soap opera that tackles "Oprah"-type issues.

Contrary to popular belief, the storylines of the reality TV shows produced and edited by Bunim-Murray are not contrived or fueled in any way behind the scenes; nor or any of the cast members portrayed in a negative or positive light through editing.

"We simply cast diverse people who would be in natural conflict with each other—rich/poor, gay/straight, shy/outgoing—and watch while the true interpersonal dynamics unfold before the camera," Raudonis said. "There's always a lot of footage on the cutting room floor. For editors, it's like looking for a needle in a haystack to find those scenes that best advance the storyline. Reality TV is an editor's medium because it relies heavily on the craft of editing to tell the story." ■



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Think Before You Integrate

Planning ahead makes everyone's job easier

by Craig Johnston

SEATTLE

As broadcasting and video facilities become ever more IT-centric, even the most experienced directors of engineering are finding it hard to keep up. Ever more, they're relying on systems integrators.

When it comes to a major facility rebuild, the technical employees do projects such as this "once every five to seven years if they're lucky," said Bob Slutske, vice president at Glendale, Calif.-based National Teleconsultants. "We do it day-in and day-out."

SIs agree that two important issues need to be settled early: the scope of the SI's responsibility and the goals of the project.

A well planned project involves "a very clear scope of work, as detailed as possible, which helps set both the systems integrator and the client on the same plane, and have the same expectations," said Tom Canavan, executive vice president for Systems and Technology at Ascent Media Systems & Technology Services.

"The scope would be more of, 'I need you to build me a control room that produces eight channels of content, etc., etc.' The goal may be different in terms of 'I need to reduce my operational cost, or I need to be able to produce more channels out of my given facility,'" he said.

Dale Hendel, broadcast operations technician at KAET-TV, runs the master control console at the DST-designed and integrated multichannel digital master control center for KAET-TV, a PBS affiliate at Arizona State University in Tempe.

SignaSys Chief Technical Officer Mark Brown said the following questions need to be answered: "What are the business goals and objectives? In other words why are you considering a new project? This leads back into corporate business goals and requirements," he said. "These very typically include, 'what are the financial requirements? Do we have staffing goals? Are we trying for a reduction in staff?'"

Often the technical makeover is part of a larger project, a remodel or new building construction. SIs encourage clients to bring them into the process early.

"I believe one of the best things any customer can do is hire the integrator at the earliest possible moment," said DST Vice President for Sales and Contracts Jeff Muhleman, "so that proper technical and workflow considerations are taken into account from the earliest parts of design."

He said when SIs are bought to the project late, they may have a facility that is not suited at all to their broadcast needs.

The Systems Group Director of Engineering Scott Griffin recommended setting aside enough time for the technical aspects of the project.

"Certainly, there would be pressure to make a launch date, but somehow there's got to be a timeframe that's actually realistic," he said.

Canavan of Ascent Media said, "As the technology becomes more software-oriented, you can't apply the same schedule model you could 10 years ago when almost everything was hardware [you could] plug into a system, turn the on-button, do some timing and adjustments and away you go. It's obviously much more complex."

World Radio History

New construction obviously involves architectural drawings, but SIs said they're important for existing facilities as well.

John Luff, senior vice president of business development for AZCAR, said, "Certainly having floor plans that are accurate, including locations of power panels, obstructions that can't be moved, for example a case that includes a microwave waveguide that can't be moved."

Up-to-date drawings are not common for existing facilities because of the time and expense involved, but Muhleman, from DST, said, "whatever can be done in preparation for partial rebuilt, to gather as much of the most current documentation as possible, is extremely helpful."

Brown added, "At least equally important is the necessity to have design and installation standards such as what are your color codes, do you have any wire numbering schemes, any pneumonic requirements, any naming conventions."

A list of legacy equipment is also critical, Luff said. He said it's important to "carefully identify equipment that has both digital and analog interfaces on it so we understand which pieces of equipment are the easiest to repurpose."

He encourages clients to evaluate "which pieces have a maintenance problem, so if it's appropriate to use this as a time to replace something that's costing a lot of money to maintain, that you can identify those things and plan for them in the detailed budget."

Griffin, from TSG, said, "One person on the client side, at the very least, needs to be empowered to make decisions that create direction for the integrator."

WHO'S IN CHARGE?

Canavan said it's a mistake to have "too many people communicating to the systems integrator, or lack of clear authority of who's in power to make the decisions."

He said this can result in early meetings where a design philosophy is communicated to the SI, "then when the drawings come in for review, somebody higher up or a different voice comes in and says 'no, that's not the way it should be, it should be this way.'"

Added Muhleman, "Oftentimes, we have clients come to us who haven't even hired their chief engineer yet."

If a startup designs and build a system without including the main users, "the integrator and the facilities management can miss the point on what's really needed."

For all the encouragement SIs give to think ahead, they caution about deciding too early on vendors, or even drawing up a firm budget.

Slutske said, "One of the roles that we've played regularly is to get there before they've created budgets. Let's find out what your business objectives are, and let us guide you in a way of thinking about those that will let you spend your money more effectively over time."

Luff said folks "should be looking at sort of the value-proposition. They can afford to spend 'n' dollars rebuilding a news control room."

Muhleman said the best approach is to decide what the desired end result is, so "requirements choose the technology, rather than choosing pieces of technology and then hoping it gives you the end-result."

NTC Senior Vice President John Aalto said that because his company has installed a variety of products, "we have a pretty good idea of what the promises, feature benefits and some of the issues that are underpinning the manufacturer's offering," said

Technical upgrades and rebuilds can be lengthy processes, and SIs warn that the client must stay focused.

Brown said that as projects progress, there is "a tendency to kind of drift from the original concept or business drivers. In other words, to lose track of why you're even doing the project, why are we even rolling out this technology infrastructure."

Griffn, of Systems Group, said, "The biggest thing is not staying on track with making final directives. I'd say the biggest mistake is simply losing track of time, not being cognizant of where a project really needs to be in the process of things during the course of it."

Brown said the work that stations do up front can have a real financial value.

"The more work they can put in up front, the more money they're going to save in the project," he said. ■

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World Radio History

SIGGRAPH to Showcase Visualization

Annual graphics show to feature Lucas keynote; emerging technologies

by Scott Lehane

LOS ANGELES

More than 25,000 people are expected at this year's SIGGRAPH conference and exposition at the Los Angeles Convention Center, July 31-Aug. 4. The show, now in its 32nd year, started out in Boulder, Colo., in 1974 as an academic conference for researchers exploring the possibilities of computer graphics. Over the years, it hasn't lost touch with its academic roots. In fact, it's become one of the premiere conferences for researchers to present their papers on a wide variety of topics including graphics, video and communications.

"We think of SIGGRAPH as a conveyor belt where conceptually ideas come up as papers, and then we see the early examples of technology and then they become more refined and we then see them on the exhibition floor—they turn into real products," said Dino Schweitzer, SIGGRAPH's chief staff executive.

Indeed there are countless examples of technologies that started out as a SIGGRAPH paper. This year, the conference will feature 98 papers covering everything from high-performance imaging to animating water drops and fluids. Contributors to this year's papers program include Microsoft Research, MIT, Stanford University, Mitsubishi Electric Research Labs, the University of Washington, Carnegie Mellon University, California Institute of Technology and ETH Zürich.

LUCAS KEYNOTE

Although it's often viewed as entirely a CG show, Schweitzer stressed, "I think SIGGRAPH fits very well with the television broadcast industry both in terms of the content, and in terms of the presentations and some of the emerging technologies. So the exhibition also has a lot of products and services that are either directly applicable or at least of interest to that industry."

Expect a packed audience for the main keynote Aug. 1 as "Star Wars" creator George Lucas presents "A Keynote Q&A with the Father of Digital Cinema."

In addition, a special session on Aug. 2 will bring together Industrial Light & Magic alumni Dennis Muren, John Knoll, Roger Guyett, and Rob Coleman to discuss the visual effects from all six installments of the Star Wars saga, comparing the techniques that ILM employed over the years.

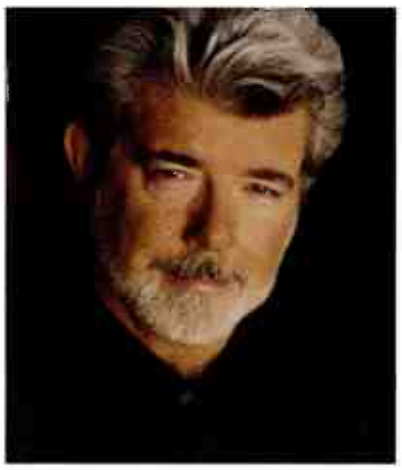
Another special session will bring together the visual effects supervisors, artists, and technologists behind "The Polar Express" to discuss how they created the 3D stereoscopic Imax version of the film.

Other sessions and panel discussions will cover topics ranging from file sharing and copyright, video games, interactive communications, special effects, and a new growing area for computer graphics—scientific, industrial and medical imaging.

"It's almost an overwhelming experience."
—Dino Schweitzer, SIGGRAPH

The emerging technologies exhibition will feature several new communications technologies, including new ideas like Haptic video, augmented reality as well as a new interactive fog screen.

But for Schweitzer, who will be attending his 25th show, the SIGGRAPH exhibition floor is perhaps the most exciting part of the show. "On the exhibition floor, there's so much multimedia going on with images and sound and music," he said. "It's almost an overwhelming experience. I walk away every year from SIGGRAPH with an extremely high energy level. I get motivated."



"Star Wars" director George Lucas will keynote SIGGRAPH2005.

HIGH ENERGY

Another reason for the high energy level is the young audience the show attracts. The show has always been seen as a major recruiting ground for new talent in the post-production and visual effects market, and show organizers encourage students to come to the free job fair held for two days through the show.

On the show floor, expect to hear a lot of talk about Apple's recent decision to switch from the IBM PowerPC chipsets to Intel chips—a topic of huge significance in the CG world, where Apple has always maintained a healthy market share.

Apple CEO Steve Job made the surprise announcement recently at the Apple Worldwide Developer Conference. The company has long touted the superior performance of its PowerPC chips (built by IBM) in graphics applications. The move to the new Intel chipsets (expected to be complete by the end of 2007), will require software developers to redesign software for the new platform and many speculate that Mac stands to lose customers in the interim.

Attendees can expect many of the Mac graphics software developers to announce their plans for the transition to the Intel chips.

Another hot topic is 64-bit computing. Expect to companies like Autodesk Media and Entertainment (formerly discreet) debuting new, re-designed 64-bit versions of its high-end visual effects and editing systems for the new 64-bit systems coming to market. 64-bit systems give dramatically better performance when dealing with the large datasets that come into play in the graphics world.

SGI will show its Prism visualization systems at SIGGRAPH for the first time. The system, which starts at under $8,500, features two to 256 Intel Itanium 2 processors, two to 16 ATI graphics processors and up to 3 TB of memory.

These systems will power a new Sony SXRD 4K projector (which made its debut at NAB) in the SGI Visualization Theater as well as a full range of high-performance development tools and applications.

Another hot topic is high dynamic range imaging. HDRI is coming of age with the openEXR file format gaining in popularity and new products like Autodesk Media and Entertainments' Toxik, and eyeon Software's Digital Fusion. HDRI gives artists an extended dynamic range, which enables graphics artists to maintain detail in the shadows and highlights of an image.

Another key technology demonstration will be the debut of the Access Grid—a new technology for remote collaboration.

"We see this as a great opportunity to enable knowledge creation and learning in this unique and collaborative environment," said James L. Mohler, SIGGRAPH 2005 conference chair from Purdue University. For the demonstration, artists from five continents will collaborate on a project in real time, with video conferencing and unique interactive feedback. ■

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FOCUS ON EDITING

Jay Ankeney

Tackling HDV Editing: At the Starting Gate

HDV was one of the hits of NAB2005. Now, as the dust is starting to settle, trying to survey the spectrum of how major editing manufacturers are tackling the challenge of posting that long-GOP (group of pictures) format is almost as daunting as squeezing a massive high-definition recording onto a tiny DV tape.

So, for efficiency, this column has asked representatives of the various players to describe the specific approaches their systems are taking toward editing HDV and what they consider to be its advantages.

First off, HDV is actually an MPEG-2 recording format that currently comes in two flavors—progressive (HDV 1) or interlaced (HDV 2). Recording 720p onto tape, JVC was the first to ship a pro-level HDV camcorder in 2003, the JY-HD10U, and this year topped it with the more advanced 3-CCD GY-HD100U with interchangeable lenses.

"We don't say progressive is necessarily better than interlaced," said Dave Walton, communications marketing manager at JVC. "But we feel scanning the CCDs progressively does give you a more cinematic look. You can also get better freeze frames without motion displacement, and it is more compatible with most progressive HD display devices. Our cameras are targeted at the emerging digital cinematography market but, of course, progressive recordings can easily be converted to interlaced."

Sony, on the other hand, has opted for 1080i recordings in its camcorders, which has come to be dubbed "HDV 2" and was originally introduced in its consumer camcorders.

As a result, "the obvious recording choice for the two professional Sony versions of HDV camcorders, the HVR–Z1U and the new HVR-A1U, was

A screenshot displaying the multicam capabilities of Apple Final Cut Pro 5.

1080i," said Bob Ott, vice president of Sony Electronics professional video and audio products. "This decision provides professional users with an easy transfer path to existing Sony professional HD equipment at a very cost-effective price."

POSTING HDV

But how do you post this new form of low-cost high-definition recording? As we'll see, some cut it in HDV's native long-GOP format, some transcode it in intraframe (I-frame only) file style, some bump it up to uncompressed HD, and others are, well, waiting until they feel they can get it right.

Pinnacle Systems was the first to demonstrate editing HDV at NAB2004.

"We can do all our real-time effects with multiple streams of HDV at full quality," said Jim Thill, product manager for Liquid Edition at Pinnacle. "With our new Version 6.1 software released this year, we do some serious math using a combination of a DirectX 9 graphics card's GPU and the CPU's own processing to let us handle up to four layers of HDV in real time. The expanded HDV capabilities of Pinnacle Liquid Edition 6.1 provide an end-to-end workflow including a full-screen preview of the editing timeline for all formats."

At NAB2005, Apple brought out Final Cut Pro 5 software that can also edit HDV natively.

"We called upon our own codec team at Apple to 're-plumb' the architecture of QuickTime 7 inside Final Cut Pro 5 to handle native HDV files," said Kirk Paulsen, Apple senior director of professional applications marketing. "To maintain the 15-frame GOP cadence, we decompress and re-construct its structure at the cutpoint in the native HDV codec without going to an intermediate format. Our tests show this approach lets us maintain the 8-bit luminance values of HDV without significant pixel value errors measured as PSNR [peak signal-to-noise ratio], resulting in an average luminance shift of only 1.6 out of 256 luminance values even after five generations."

Adobe Systems is taking a different approach with its Premiere Pro 1.5 editing software. Richard Townhill, group product manager at Adobe Digital Video and Audio said any Premiere Pro editor could download a free HDV plug-in at *www.adobe.com/products/premiere/hdv.html* since Version 1.5 was released before all HDV formats were available.

"We transcode HDV during capture to a wavelet file format that Adobe has licensed from Cineform which, in addition to giving us a two-frame GOP for improved editing performance, converts the 4:2:0 color space of native HDV into full 4:2:2, which we feel gives us improved compositing and effects capabilities without losing color definition."

Sony Vegas 6 software can go either

TACKLING, PAGE 39

"To maintain the 15-frame GOP cadence, we decompress and re-construct its structure at the cutpoint in the native HDV codec without going to an intermediate format."

—Kirk Paulsen, Apple

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INSIDE BROADBAND

Will Workman

Internet Video for And by The People

I remember clearly the first time I saw the marriage of the Internet with a GUI (Mosaic), the first time I tried Napster, and my first glimpse of TiVo. Each experience caused a tingle, an a-ha! moment in which one could peer down evolutionary paths and see a coming revolution.

For years now, broadband has been lacking its definitive moment. Although it has rapidly increased in penetration and enhanced existing features with higher speeds, it's also been waiting interminably for the technological catalysts that would create truly revolutionary content beyond static text, graphics and images.

For all the tremors caused by P2P file sharing, blogs and podcasting, it's video that carries the most potential impact for a seismic shift in our all-too-visual culture.

And because of its cost and complexity, it's video that has most eluded the reach and control of the broadband masses—until now.

Pieces—*big* pieces—have been falling into place that will dramatically increase the production and use of broadband video, creating the next evolutionary stage of the Internet as a converged platform allowing people to produce, distribute, seek and watch video.

In recent months, two new major players and three established ones have joined a host of others enabling this next phase.

The wrangling for video hegemony will pit the public service and grassroots concepts of Open Media Network and Ourmedia against the financial, promotional and alluring content muscle of the major media conglomerates.

OPEN MEDIA NETWORK

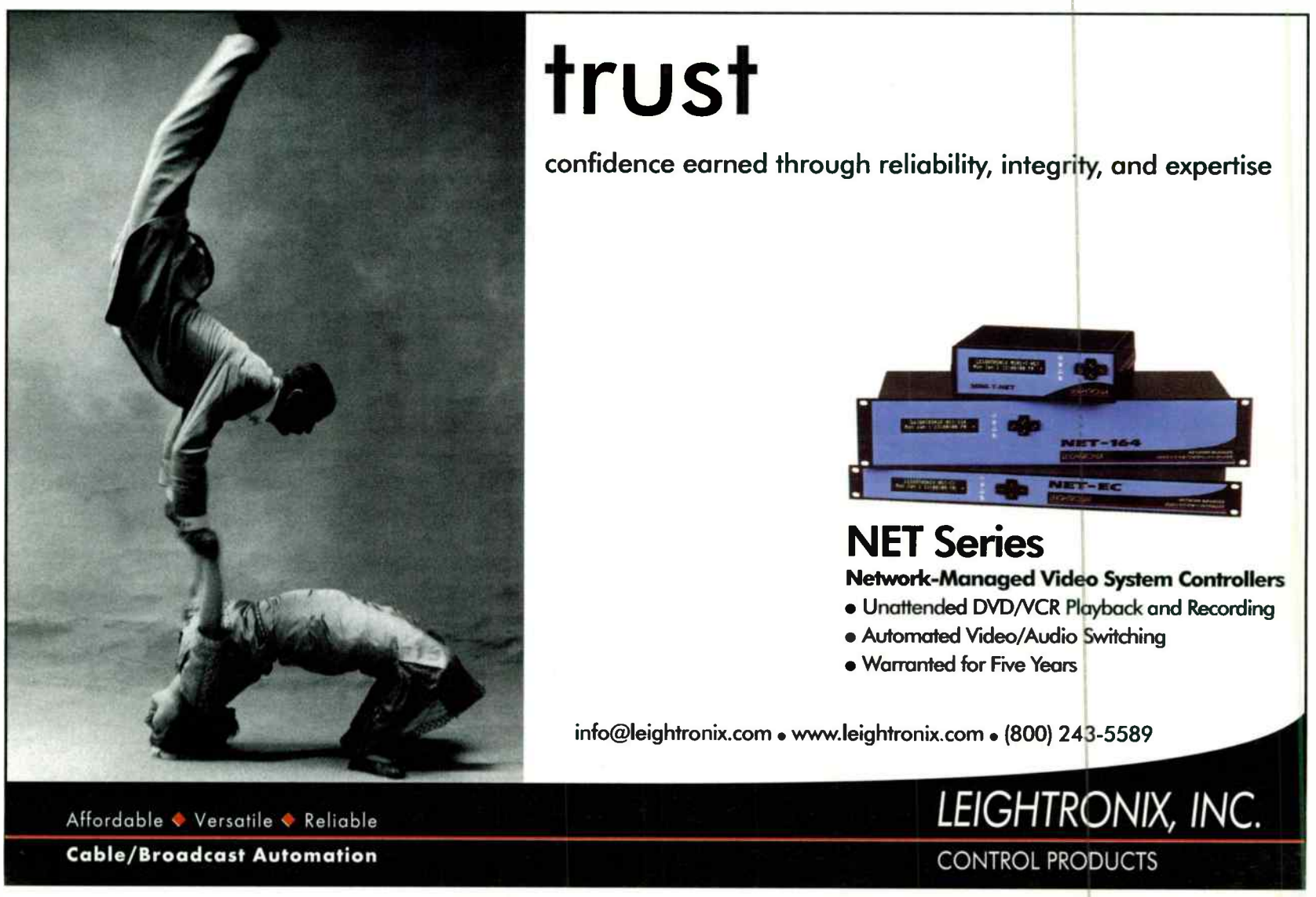
Two non-profit networks, Open Media Network, founded by Netscape pioneers Marc Andreesen and Mike Homer, and Ourmedia, backed by the storage capacity of San Francisco-based Internet Archive, are offering video hosting and searching tools. Both are pushing for open standards to make archived video easily posted, searched and viewed—the latter a headache for users navigating the three dominant video playback formats: Apple QuickTime, RealNetworks Real, and Microsoft Windows Media.

"We'll host your media forever—for free," declares the Ourmedia mission on its Web site (*www.ourmedia.org*). CEO J.D. Lasica and founder Marc Canter talk of a "grassroots media revolution," and say that citizens have an opportunity to wrest control of media away from conglomerates.

Sounding a similar note, Homer from Open Media Network talks of its free site providing "public service content," which might include everything from public TV shows to independent films.

The commercial arena has also been busy. Google co-founder Larry Page announced at the NCTA show in April that the search engine has begun archiving personal video clips, a move he termed an "experiment in video blogging."

In January, it took the wraps off Google Video, which allows users to search the text of TV shows the same



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day they air.

That followed on the heels of similar announcements by Yahoo! and AOL. Microsoft, meanwhile, has been strictly fee-oriented, tinkering with an advertising search service, and recently launched "MSN Video Downloads," offering daily TV shows for personal playback.

OPEN SOURCING

All are capitalizing on a number of recent technological developments:

For authoring, Yahoo! recently published an open protocol for video, Media RSS 1.0 (Really Simple Syndication), allowing content authors to label their work and syndicate it for Web distribution.

In the distribution area, new software such as BlogTorrent use BitTorrent file-swapping to help users post and disseminate large files.

For searching, in addition to the *dot.org* and *dot.com* ventures, a Canadian student has written a client program, Videora, that offers TiVo-like searches of RSS video feeds, including TV programs.

To allay the copyright protection abuse that sank Napster, distributors are employing control of their sites rather than enabling open P2P forums. Open Media Foundation, for example, uses Homer's Kontiki technology to add digital rights management and a payment system for any copyrighted works.

At stake in all these developments is control over future multimedia platforms that will seek brand identities and mass audiences in order to draw some of the $60 billion spent annually on advertising. That sum, now spent predominantly on TV, will shift dramatically as DVR use becomes widespread.

Cable operators are now integrating DVR features into the next generation of set-top boxes. Once more DVR users employ its ability to skip commercials, the ripple effect caused by losing a significant chunk of TV eyeballs will force advertisers into alternative, Web-based delivery methods.

WRANGLING FOR NO. 1

The wrangling for video hegemony will pit the public service and grassroots concepts of Open Media Network and Ourmedia against the financial, promotional and alluring content muscle of the major media conglomerates.

Even the two nonprofits have their own for-profit agendas. More Ourmedia users will generate more business for Broadband Mechanics, Ourmedia founder Marc Canter's firm that designs so-called "digital lifestyle aggregators," tools that combine video with communications and social networking.

Homer's Kontiki also stands to benefit from companies licensing its video distribution technology to take advantage of the open video media boom.

For too many decades, video programming has been under the hamfisted, despotic control of media conglomerates. Driven by advertising and appealing to the lowest common denominator in human emotions, this process has left our culture awash in irrelevance, with people increasingly oriented towards hollow needs fulfillment. The public service principle that originally accompanied broadcast media, meanwhile, has been ground to dust; conservative lawmakers speak openly of dismantling public TV.

Now, at last, we may be on the cusp of a new mass medium, by and for the people rather than used to coerce, desensitize and manipulate us. But that's the optimist in me; the pessimist notes this grand irony—that the very passivity ingrained in us by our TV culture may sap our ability to seize this moment. ■

Will Workman is a former senior editor of Cable World magazine and editor of MediaView, a monthly newsletter for the Asian cable industry. You can reach Will at wworkman@aol.com.

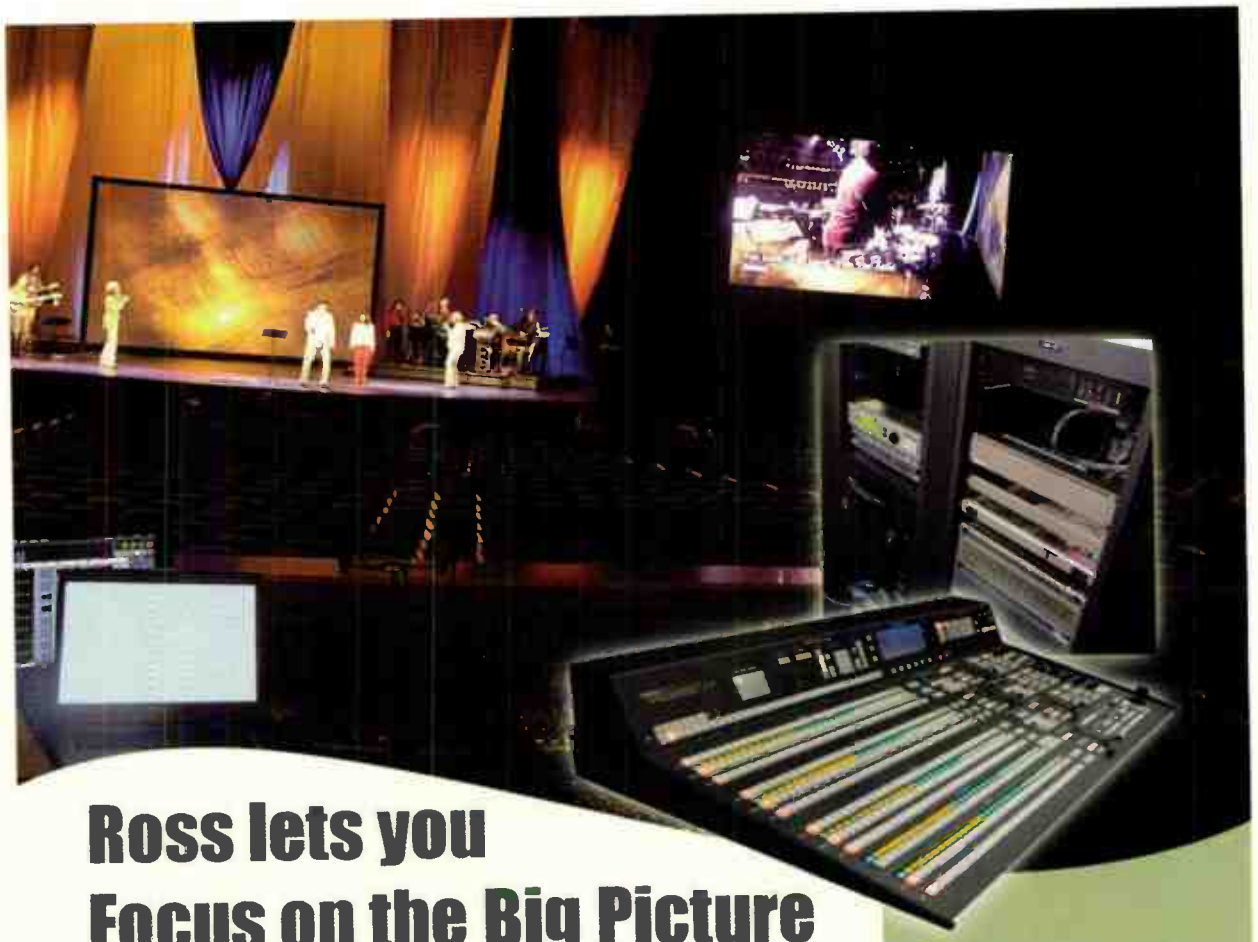

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Photo: Steve Jordan

THE BIG PICTURE — Frank Beacham

Finally, FCC May Turn to Real 'Indecency'

It's hard to imagine a greater "indecency" on broadcast television than faking the news or tricking viewers into believing commercials are genuine informational programs.

Like it or not, most people in the United States depend on the broadcast medium for most of their news and information. Very few viewers have the level of media literacy required to figure out the difference between the blow-dried news reporter and the blow-dried actor playing one on TV.

Since broadcasters enjoy the free use of the public's spectrum in exchange for some modicum of public service, one would think the industry would be long beyond "payola" in news and information programming. Unfortunately, it's not. The problem has never been worse.

The good news is that the FCC has finally been embarrassed enough to do something about it. Speaking at a Media Institute event in Washington, D.C., recently, FCC Commissioner Jonathan Adelstein issued a scathing attack on the practice of tricking viewers with fake news reports that mask commercial plugs.

"Undisclosed promotions are not just wrong—they are payola, and they are illegal."

—FCC Commissioner Jonathan Adelstein

"Not only are celebrity chefs and celebrity fashion up for sale but, most ominously, news shows are increasingly up for bid," he said.

The Democratic commissioner, just reappointed by the Bush White House to another term on the FCC, also made it clear that he was speaking on behalf of the majority of the commission, which he promised will soon "vigorously" crack down on the practice.

As a prelude, the FCC issued a "Payola Fact Sheet" that states the rules and tells viewers how to complain. The complaint part got early traction. The media activist group Free Press has already filed a formal FCC complaint, citing government payments to commentator Armstrong Williams and incidents of "pay-for-play endorsements" on NBC's "Today Show."

For reasons ranging from a relaxation of public service requirements to broadcast ownership consolidation, Adelstein used his speech to deplore the increasing commercialization of American media.

"We see reports of video news releases masquerading as independent, legitimate news; PR agents pushing political and commercial agendas that squeeze out real news coverage and local community concerns; product placements turning news and entertainment shows alike into undisclosed commercials; and well-trained marketers preying on the unsuspecting minds of our young children," Adelstein said.

Viewers, he said, are frustrated by what they see as "fake news" and relentless marketing. "They are angry when they do not get real news and accurate information that empowers them to make informed decisions. It is no wonder trust in the media is at an all-time low—something needs to be done."

The problems, Adelstein said, go far beyond the issue of government video news releases on news broadcasts. There are also covert commercial pitches.

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"It works like this: consumer product experts pitch themselves to manufacturers to mention their products on television—for a fee of course—and then they pitch themselves to local TV stations for interviews.

"The media appearances often coincide with holidays or tradeshows," he continued. "The experts may conduct dozens of interviews with different stations over the course of a day in what is called a 'satellite tour.' These so-called experts do not always disclose their financial interest in the products they promote—and as a result stations do not always disclose that to viewers."

Adelstein cited recent news reports saying that a mention on a local news show ranges in value from a few hundred to a few thousand dollars, and if a mention makes it on to network shows like "Good Morning America" or the "Today Show," the publicity value skyrockets to a quarter of a million dollars.

On-air "experts" and PR agents sometimes say it is the broadcasters' responsibility to disclose, Adelstein noted. Broadcasters sometimes say they are not aware of money changing hands.

"But the law does not allow this blame game," Adelstein said.

On-air "experts" must disclose to stations that they have been paid for promoting a product on the air, and broadcasters must then disclose to their audience that someone was paid for it.

Those disclosures must be meaningful, he emphasized.

"A disclosure that appears on screen for a split second during the credits in small type that no one could possibly read without pausing their DVR—and pulling out a magnifying glass—could not possibly qualify," he said.

Adelstein said there is "a shocking lack of awareness about our rules by broadcasters and on-air personalities alike. Both are required to disclose. Undisclosed promotions are not just wrong—they are payola, and they are illegal. That applies to product placements, paid VNRs, or anything for which payment is made but not disclosed. It is high time to employ some lessons about the law so this does not continue happening." ■

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

The FCC's Payola Rules

The Communications Act and the FCC's rules require the following:

When a broadcast licensee has received or been promised payment for the airing of program material, then, at the time of the airing, the station must disclose that fact and identify who paid for or promised to pay for the material. All sponsored material must be explicitly identified at the time of broadcast as paid for and by whom, except when it is clear that the mention of a product or service constitutes sponsorship identification.

Any broadcast station employee who has accepted, or agreed to accept, payment for the airing of program material, or the person making or promising to make the payment, must disclose this information to the station prior to the airing of the program.

Any person involved in the production or preparation of a program who receives, or agrees to receive, payment for the airing of program material must disclose this information. Broadcast licensees must make reasonable efforts to obtain from their employees and others they deal with for program material, the information necessary to make the required sponsorship identification announcements.

The information must be provided up the chain of production and distribution before the time of broadcast, so the station can air the required disclosure.

These rules apply to all kinds of program material aired over radio and television stations. Some may also apply to cablecasts. ■

Source: FCC

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ERG HD Monitors

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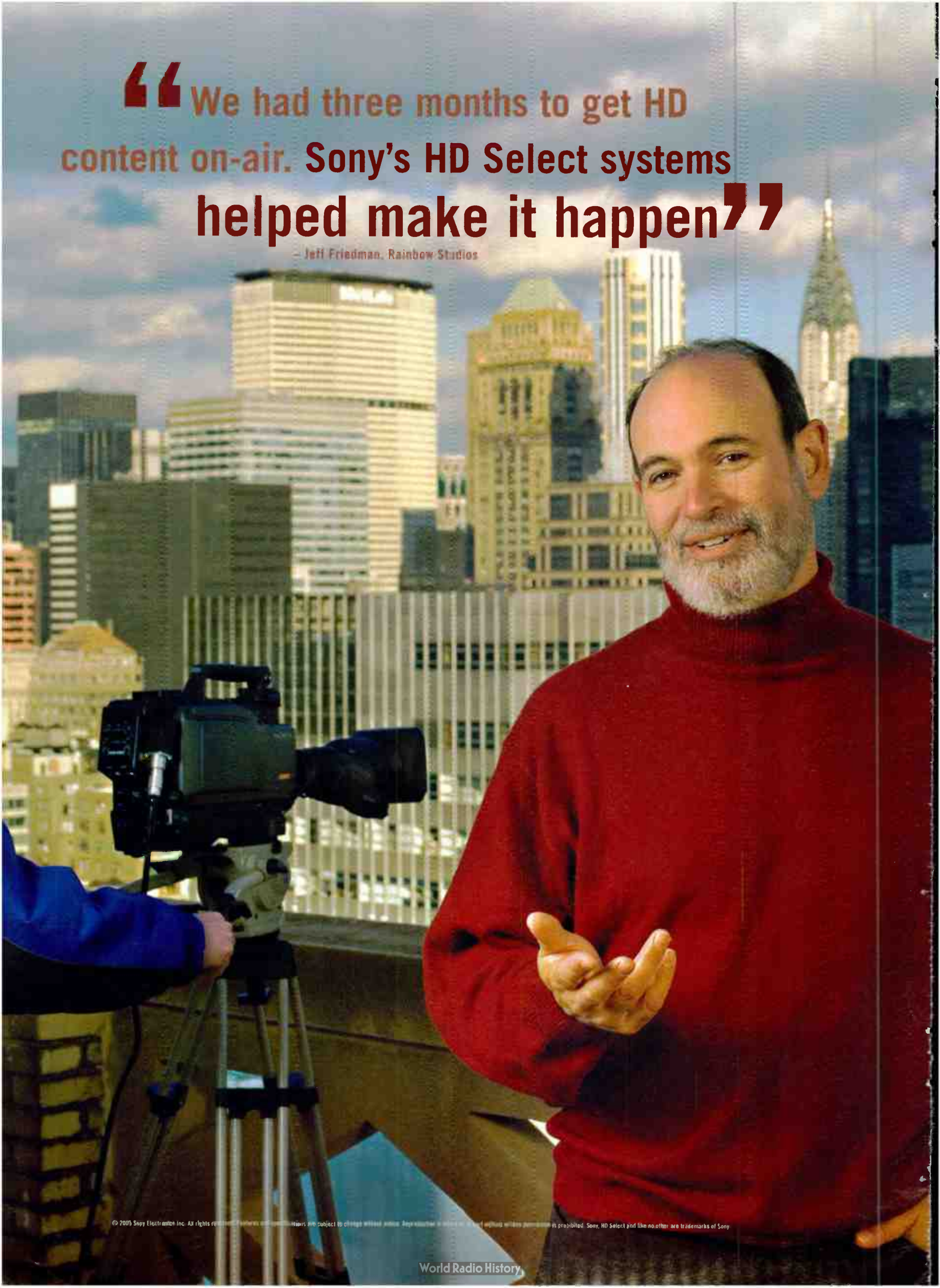

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SONY

HDelivered.

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

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

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THE MASKED ENGINEER | Mario Orazio

What About the Tiny TVs?

You might not have noticed that there are numbers smaller than 13. I point this out because the FCC, Our Beloved Commish, seems to have just made the discovery.

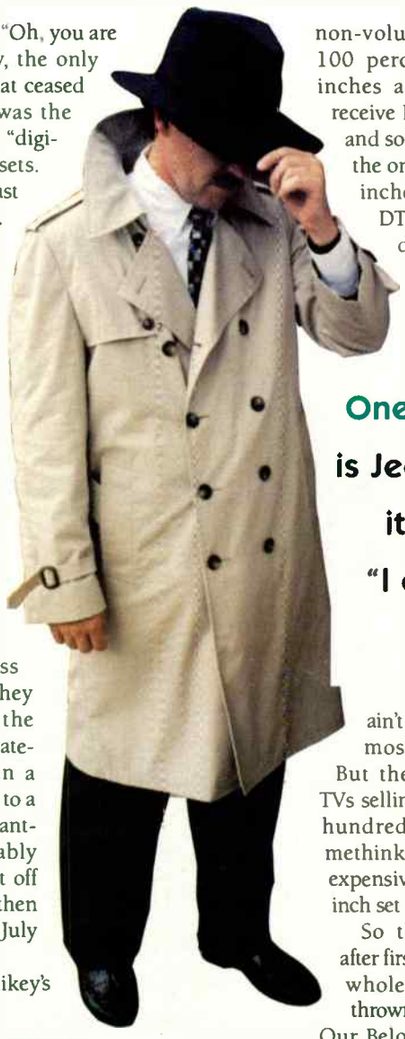
Yes, of course, I'm taking about the famous "tuner mandate." Humor me while I provide a bit of history.

The FCC issued its DTV rules around the 1997 NAB show, by which time a couple of stations had already been on the air for about nine months. By the 2002 NAB show, DTV should have been a happening thing. It wasn't.

So FCC chairman Michael "Mikey" Powell came up with a "voluntary" plan to get things going. He told networks to transmit DTV-type programming (HDTV or "value-added" stuff). He told broadcasters to pass through the network stuff. He told cable ops to carry those broadcasts and provide HDTV and digital outputs from cable boxes. He told cable equipment makers to provide those boxes. And he told TV makers to roll out sets with DTV reception on a phased-in basis, starting with big-screen sets and ending with all those 13 inches and up.

The networks, broadcasters, and cable ops sent letters to Mikey telling him how wise he was, so he forgot all about them. The TV set makers sent a letter saying something in the vicinity of "Hey! This is expensive stuff!"

I'd say that was a totally legitimate response, but methinks Mikey was more interested in "Oh, you are so wise." Anyhow, the only part of the plan that ceased being voluntary was the part about adding "digital tuners" to TV sets. Mikey's schedule just slipped six months. So, instead of the first part kicking in on Jan. 1, 2004, it was delayed to July 1.



LEND ME A TUNER

As of that date, 50 percent of TV sets with screens 36 inches or bigger were supposed to receive DTV. Now then, there are a handful of 36-inch TVs selling for less than $1,000, so they were just put in the other 50-percent category. Adding even a $500 DTV receiver to a $10,000 deluxe giant-screen TV probably wasn't going to put off many buyers. But then came this month, July 1, 2005.

According to Mikey's non-voluntary schedule, 100 percent of TVs 36 inches and up need to receive DTV this month, and so do 50 percent of the ones from 25 to 35 inches. They tell me DTV reception these days adds just a hundred bucks to a TV's cost. That probably ain't a deal breaker on most 36-inch TVs. But there are 25-inch TVs selling for less than a hundred bucks, and methinks even the most expensive CRT-based 27-inch set is less than $400.

So the TV makers, after first trying to get the whole tuner mandate thrown out, appealed to Our Beloved Post-Mikey Commish for a little leeway. Keep the 100-percent requirement for 36 inches and up, they said, but eliminate the 50-percent requirement on TVs 25 to 35-inches on account of a hundred bucks being a lot to add to an under-$100 TV. We do think the DTV receiver circuits will get cheaper, so here's the deal. We'll move up the 100 percent requirement for the 25-to-35s to March 1, 2006 instead of July 1.

Last month, the FCC ruled. No thanks, they said. We'll keep the 50-percent requirement. But, on account of you saying you could do 100 percent by March, we'll take you up on that, too. And, while we're at it, we might just move up the requirement for all TVs 13 inches and up and other tuner-equipped devices (like VCRs and DVD recorders) from July 1, 2007 to no later than Dec. 31, 2006. Oh, and what about TVs under 13 inches?

The set makers learned obeisance. Their response to the ruling was something like, "Gee, we're a wee mite disappointed about the July 1, 2005 part, but you sure are wise anyhow!"

Then they started introducing more video screens without analog tuners. No analog tuner, no digital mandate.

Just like all the rest of you, I can hardly wait to see the prices of 25-inch TVs with DTV receivers. But I've been wondering about the last part of the FCC order for quite some time. What about those TVs under 13 inches?

Google "5-inch TV," and you get 330,000 hits. Try "7-inch TV," and it's 323,000. Other sub-13-inch sizes offer comparable quantities of hits. Heck, "8-inch TV" brings 334,000.

One of those 330,000 5-inch TV hits is a list of about 20 Chinese manufacturers and the 5-inch TVs they offer. All of them run on batteries.

There are some color LCD TVs that are great for taking to the game. They're a little on the pricey side.

Then there are contraptions with fluorescent lamps, flashlights, weather radios, and even a siren. They're intended for camping, I guess, or maybe for when the power goes out. They seem to run around $50 or so.

One brand being offered is Jeep. "Hey, I'm rugged," it seems to suggest. "I can deliver reruns in the wilderness."

Then you've got your basic, 5-inch battery-operated TV, maybe with an AM/FM radio. They cost less than $20. You can find them at drugstores and supermarkets, or try the aforementioned Google search. I found one company that wanted just about $15, including shipping.

Methinks it unlikely that anything with DTV reception is ever going to cost $15. But I'm also wondering about the batteries. Some states seem to be trying to ban DTV receiver boxes because they draw too much power.

Now, then, I ain't a scholar of Chinese electronics manufacturing, but I'd guess that if there are 20 companies making 5-inch TVs, it's on account of they expect to sell them. One brand being offered is Jeep. "Hey, I'm rugged," it seems to suggest. "I can deliver reruns in the wilderness."

Maybe the other brands push the idea that battery-operated TVs continue to work during power failures. Ready.gov calls for battery-operated radios in homeland security kits; why not battery TVs?

I don't envy the FCC. If they add the tuner mandate to under-13-inch TV models, they'll get expensive and maybe need power plugs. If they don't add them, then what exactly are people supposed to watch on them after the analog plug gets pulled? ■

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

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World Radio History

DIGITAL TV

Charles W. Rhodes

The Superheterodyne Concept and Reception

The first television receivers were designed to receive BBC transmissions from the Crystal Palace transmitter in London. This was, incidentally 405-line all-electronic television, then regarded as HDTV by those who saw it. As there was only one transmitter in all of the United Kingdom, extremely simple receivers were practical. This simple receiver topology encouraged home constructors to do it themselves, and many did.

All later television receivers were of the superheterodyne type. In fact, all radios, television receivers, terrestrial and satellite, and all radar sets employ this superheterodyne principle, invented in 1916 by Edwin Howard Armstrong when he was serving in the U.S. Army in France. The concept came as a solution to the problem of trying to amplify the weak "wireless" signals with the primitive triode vacuum tubes then available. He hoped to detect approaching aircraft by hearing the impulse noise of the ignition systems; that would require a lot of sensitivity before the detector tube. Tubes in those days were ill suited to amplify high-frequency signals, so Armstrong reasoned, "Why not heterodyne the high-frequency signal to a much lower frequency where it could be efficiently amplified as much as one might wish?"

This is the fundamental concept of all superheterodyne receivers.

The concept might have worked out given more time, but World War I ended too soon. Major Armstrong went home and invented the superhet radio receiver and went on to also invent the super-regenerative detector (the circuitry of the proximity fuse used in World War II) and in 1933, wideband frequency modulation radiobroadcasting.

The world's first FM broadcast tower at Alpine N.J., was pressed into service for TV broadcasting after 9/11.

His FM transmitting tower is still in use at Alpine, N.J. atop the Jersey Palisades. After 9/11, TV stations operated from that historic tower to serve the New York area.

Today we don't use vacuum tubes in receivers, but all radio and TV receivers use Armstrong's superheterodyne receiver principle. The strengths and weaknesses of this invention are important to the future of terrestrial TV broadcasting, so please read on; you can quickly become an expert on superheterodyne receivers and amaze your boss.

INTERFERENCE REVIEW

This column has said a lot about signal distortion, especially IM3 (third order intermodulation) distortion. This is because third-order distortion is responsible for *most* interference between signals; it is both inherent and always bad in amplifying devices. But there is a very useful order—second-order distortion—that is also inherent in active devices, and without it, we would not have radio or television.

Second-order distortion produces sum and difference frequencies of pairs of frequencies present at the input. Let us call the signal frequency Fs and for the frequency of a local oscillator (LO), we'll use Fo. Second-order distortion produces two new frequencies: Fo + Fs and LO – Fs.

The difference frequency is usually the useful component in the output of the frequency mixer. You might wonder how the feeble radio signal can produce any kind of distortion? Alone, it cannot. The much stronger power from the LO drives the mixer into nonlinearity and causes it to generate the sum and difference frequencies. The signal carrier and its sidebands are shifted in frequency, but not otherwise altered by the mixer. The modulation of the signal is not affected in this frequency conversion process.

Armstrong's superheterodyne receivers were revolutionary in 1923. They were so sensitive they could be used with a loop antenna instead of the usual long-wire antenna needed for TRF and regenerative receivers. The only tubes available were triodes and these could only amplify signals far below the broadcast radio frequencies. Early superhets used an intermediate frequency (IF) between 30 kHz and 90 kHz. And herein lies a problem.

Consider the receiver was tuned to 800 kHz by tuning its LO to 845 kHz. The useful mixer output was at 45 kHz and this was amplified in a cascade of tuned IF amplifiers.

But alas, what if there was a second station at 890 kHz? This would also be heterodyned to the IF and it would be heard too. The only way around this is to provide RF selectivity ahead of the mixer. The RF filter would be tuned to the desired signal, and thus the undesired signal would be attenuated.

The higher the IF, the greater the attenuation of the undesired signal. But until pentode amplifier tubes were introduced, an IF frequency above 90 kHz was not practical. This form of interference was named "image response." This naturally causes a lot of confusion in the TV world, but this name is still being used.

ADDING PICTURES

Jumping from radio to TV, the first pre-World War II RCA television receivers were superheterodynes with a picture IF of 12.75 MHz. The sound IF was 8.25 MHz.

The frequencies used for television broadcasting were 44 to 90 MHz.

The picture carrier was 1.25 MHz above the lower channel edge, the sound carrier 0.25 MHz from the upper channel edge, and each channel was 6 MHz wide. The lowest picture carrier frequency was 45.25 MHz. The picture IF was 12.75 MHz so the LO was tuned to 58 MHz. Such receivers were vulnerable to image interference from a signal at 58 + 12.75 MHz = 71.00 MHz (there were no TV channels between 72 and 78 MHz then). An aural carrier at 71.75 MHz would have produced a signal just outside the IF bandpass at 13.75 MHz, which would not have reached the second detector.

After World War II and up to 1952, television receivers used a higher IF near 26 MHz for the picture, and went 4.5 MHz lower for the aural IF, which was by then using the Armstrong's frequency modulation. This increase in the receiver IF was forced by the introduction of the high VHF band, from 174–216 MHz. Suppose the earlier IF had been retained in the post-World War II period. The Channel 7 picture carrier, 175.25 MHz

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World Radio History

Tackling

CONTINUED FROM PAGE 28

way by cutting HDV off tape natively, or, as Dave Chaimson, vice president of marketing at Sony Media Software, recommends, transcoding it into an AVI file format through the Cineform codec built into the Vegas application.

"The AVI files let you edit much faster, even though they increase storage requirements," Chaimson said, "but of course the transport stream gets recompressed to MPEG-2 upon output. We feel the intermediate codec provides a better editing experience and more precise editing control of any HDV recordings, and lets you get this performance even when using relatively slower platforms like laptops."

With its new Edius Pro 3 software, Canopus has another option for transcoding HDV during editing.

HDV OVER FIREWIRE

"You can bring in the HDV data directly on a system with OHCI [Open Host Controller Interface] over FireWire," said Brandon Higa, senior marketing engineer for Canopus. "Or you can use it in conjunction with our Edius NX for HDV or Edius SP for HDV hardware cards in our board-and-software sets, or our Edius SD or Edius HD turnkey systems, all of which convert 720p HDV into 1080i on the fly. But the key Canopus advantage is our Canopus HQ codec that converts the MPEG-2 transport stream into our own format of AVI files on your hard drive. This intraframe compression format is easier for your CPU to decompress, giving you four streams of HQ video, and it provides the 4:2:2 color space for improved layering and effects. We feel the variable bit-rate Canopus HQ codec also delivers better image quality when going to an analog output."

In June, Leitch Technology released one of the latest entries into HDV editing with its new 9.1 software for its VelocityHD nonlinear edit system.

"We've chosen to transcode HDV during real-time ingest into our LWC-1 compression format," said Mike Nann, product marketing manager, post-production editing at Leitch. "Our full raster, variable bit-rate LWC-1 format is our own style of wavelet compression and uses an intraframe structure which is much easier and faster for editing than interframe long GOP. In our mind, HDV is just one of the high-definition formats our VelocityHD customers will want to work with on the same timeline, maintaining all the real-time capabilities they have come to expect"

Specializing in the highest end of post production, the folks at Quantel are handling HDV the easy way. They simply bump HDV up to an uncompressed baseband format and post it as they would any other HD signal.

"Quantel's attitude to HDV is that we very much welcome everything that will move our world more rapidly towards HD, and HDV is definitely a bridge to that," said Steve Owen, post DI marketing manager for Quantel. "Even if its application at the higher end of post would inevitably be somewhat limited due to HDV's highly compressed nature."

Finally, even though Avid did not present shipping HDV editing capabilities at NAB2005, their market position justifies being included here.

"We have been demonstrating native HDV editing in our roadshows, and will have a beta release this summer," said David Schleifer, vice president of broadcast and workgroups for Avid. "We want to work out all the kinks so people will have the smooth workflow with HDV that they expect from our NLEs. When we ship our native HDV editing solution in Q4, it will be another resolution in our timeline that editors can mix and match with the same feel of all the other formats." ■

Jay Ankeney is a freelance editor and post-production consultant based in Los Angeles. Write him at 220 39th St. (upper), Manhattan Beach, Calif. 90266 or at JayAnkeney@aol.com.

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World Radio History

TUNING IN | Gary Arlen

High Definition Comes To Videogames at E3

Imagine the simultaneous sounds of a jackhammer and chainsaws. And a chorus of dental drills. Plus a rocket launch and a supersonic fighter jet flyover, accompanied by the squealing giggles of a gaggle 12-year-old girls. Add the blare of every heavy metal band ever recorded.

Put them all together, and you're still nowhere near the din at the Electronic Entertainment Expo, better known as E3, the videogame extravaganza where sounds sometimes overwhelm the spectacular sights and interactivity of the thriving videogame industry.

This year's E3 blast in Los Angeles in mid-May offered conclusive proof of why the videogame industry can claim its revenues of about $12 billion are "bigger than Hollywood." The sheer frenzy about new consoles, PC and networked games—especially MMOGs (massive multiplayer online games)—plus the growing trill of mobile entertainment services adds up to an entertainment bonanza.

This year's E3 blast in Los Angeles in mid-May offered conclusive proof of why the videogame industry can claim its revenues of about $12 billion are "bigger than Hollywood."

At the most fundamental levels, the TV industry is confronting the burgeoning videogame industry in several ways. Contention for eyeball time is severe, especially when those 40 or 50 million consoles (Xbox, PlayStation, GameCube and earlier models) are attached to TV monitors that are *not* being used for conventional program viewing. The TV sets themselves—especially new digital monitors—are an essential ingredient in the newest immersive, graphics-rich titles.

Outside the E3 Expo in Los Angeles

Not surprisingly, Hollywood is still trying hard to find the formula to leverage its story-telling skills onto the vitality of the new videogame platforms. As competitive publishers point out, the big studios have made expensive blunders in past efforts to join the game parade. But that didn't stop NBC-Universal, Warner Bros. and others from launching their latest assaults during E3. Not to mention Sony (owner of several movie studios and TV production houses), whose new PlayStation 3 and PlayStation Portable, (which can also play mini-sized DVDs) were among E3's highlights.

The sound of money: more than 70,000 attendees endured the cacophony of the E3 exhibit floor.

Indeed, E3's loudest buzz was about the arrival of three next-generation game platforms, which are triggering a frenzy of content development.

Microsoft Xbox 360 will be the first on shelves, probably by early autumn. It will handle dual-layer DVDs and include a WiFi networking as well as a built-in Ethernet connection.

PlayStation 3 is due out next spring, and Sony offered limited glimpses of the product, which will run Blu-ray high-capacity DVDs and also include WiFi and Ethernet connections as well as Bluetooth wireless links for up to seven controllers.

Nintendo Revolution, a sleeker device than the company's previous GameCube, will use a new IBM processor code-named "Broadway," which has at least double the power of previous models. The company has not indicated when Revolution will hit the market. Nor were prices listed for any of the new consoles, although analysts agreed that the upgraded units will probably sell for about the same initial prices as their predecessors, i.e. less than $300.

HD ENTERS THE GAMES

Although you often couldn't hear what the booth sales personnel were pitching, you could easily see the rapture with which fans—especially the vast youth component of E3's 70,000 attendees—absorbed the games' sounds and sights.

Among the attractions, albeit somewhat limited, was high-definition video, which will be part of Xbox 360 and Sony PS3. Both devices will also generate widescreen displays if they are attached to widescreen monitor, a feature that some analysts predict will spur the sales of such monitors.

Reinforcing that expectation are retail deals such as the one Microsoft and Samsung unveiled—a cross-promotion in which Xbox 360 games will be displayed on Samsung HDTV monitors in 25,000 stores worldwide.

While big-screen presence fits the ever more lifelike graphics and video of the newest games, there is also a push for small-screen gaming—fueled by PSP's success. Games that can be played on mobile phones and other portable devices are a growing part of the equation—with some publishers promising their products can be ported onto whatever platform the player wants to use. For now, there are graphics limitations on the smallest portable devices, but the enthusiasm of the market suggests that audiences will find a way to play if their devices are ready for it.

In some of E3's quieter venues, industry executives reflected on directions for the maturing games market.

Douglas Lowenstein, president of the Entertainment Software Association, which runs E3, urged developers "to shatter negative stereotypes" and "to resist the temptation to narrowly target the growing 'mature' segment of the gaming audience.

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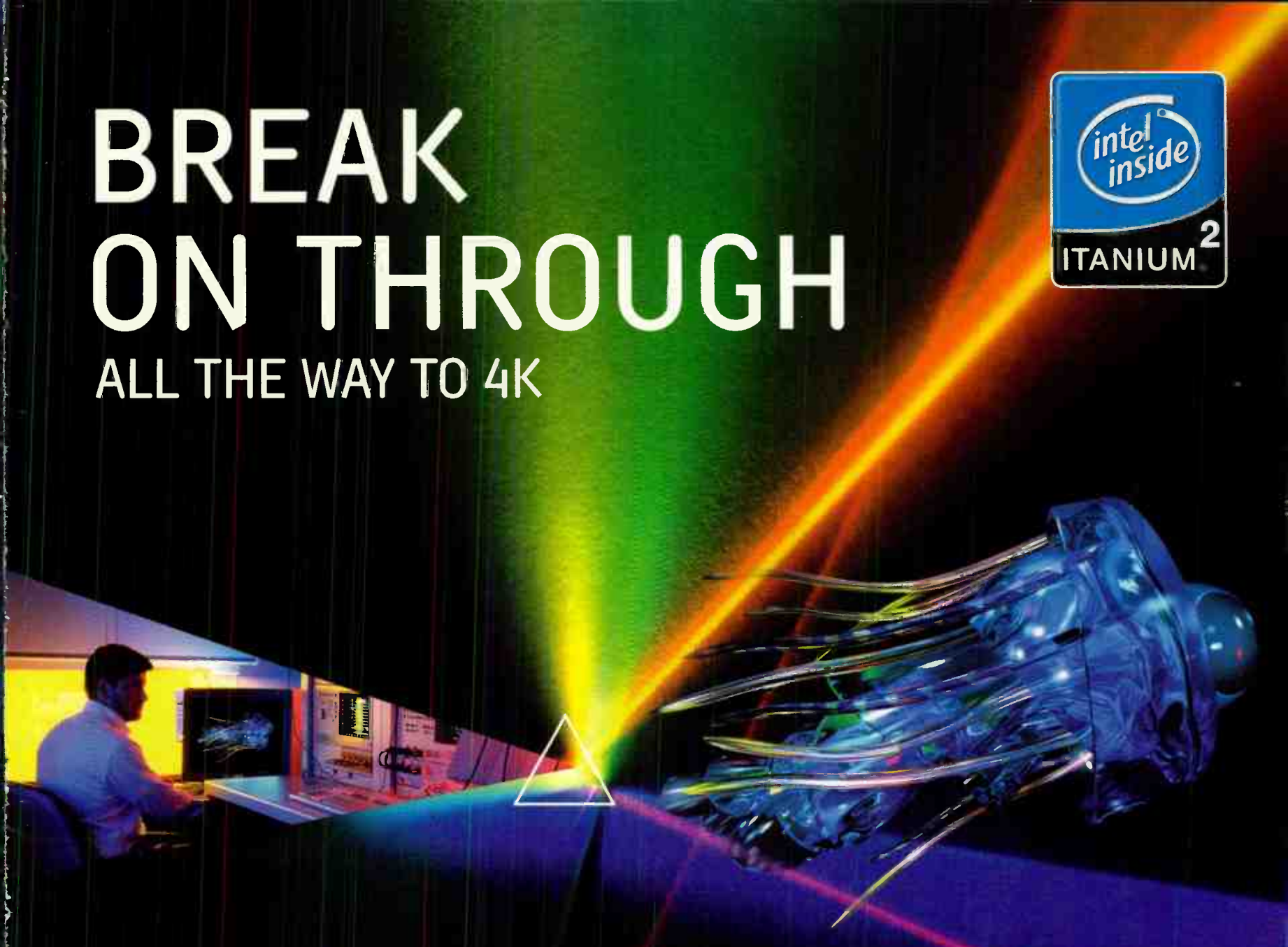

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World Radio History

PRODUCTION MANAGER Craig Johnston

Pitfalls of Producing On a Collision Course

I once watched a competing station launch a five night-a-week magazine show at 7 p.m. The station didn't subscribe to a PM Magazine kind of co-op, where they'd get stories from other markets to run. They did it all themselves.

These types of shows can be particularly tough for a station to do because they require setting up a separate news department—hiring staff and buying equipment and vehicles.

The show was scheduled to premier in September, and the staff spent the whole summer doing stories that sat in a story bank, ready to air when they were needed in the fall.

They had one other buffer to help them ease into day-by-day production once the show hit the air. They were an ABC affiliate, and because of Monday Night Football, they'd only be producing for four nights per week until the regular NFL season ended in mid-December.

They ran out of summer-shot stories in the bank at almost the same time Monday Night Football ended for the year, giving them a double shock just in time for Christmas.

The way I remember the story, they ran out of summer-shot stories in the bank at almost the same time Monday Night Football ended for the year, giving them a double shock just in time for Christmas.

The amazing thing is that they had been on a collision course with that moment for months, and they went right ahead and collided.

I know something about collision courses, and how to spot them. Prior to coming to work in TV, back in the Pleistocene, I worked summers on a commercial fishing boat in Alaska. The skipper himself didn't want to steer all the time, and he didn't want the boat to crash, so he taught us how to spot a collision course.

His advice? When you see another boat approaching from any angle, pick some object on our boat to note that angle. Continue to steer the course you're steering, and wait a minute or so (if you have that much time left), and check to see if the angle to the oncoming boat has changed.

If the angle of approach has changed, you are not on a collision course. If that angle has not changed, you are on a collision course, and you'd better do something about it.

As near as I can remember hearing, no television station has actually physically collided with another station. But events like what happened with the magazine show have resulted in painful collisions.

In that instance, I think everyone on the staff knew when they were going to five days a week from four, they just didn't realize they were going to run out of the banked stories at about the same time.

I'm going to pull some numbers out of the air that are probably pretty realistic. Let's suppose the magazine show used three stories an episode, that they had 13, four-day weeks of shows before Monday Night Football ended, and that they had banked 30 stories during the summer.

Around the first of November, they would have finished seven weeks of production. If they found they had 13 or so stories left in the bank, it would tell them they were going through a little more than two banked stories a week, and that those banked stories were making up just under 20 percent of the stories used each week.

It also would tell them that at that pace, they would run out of banked stories in the middle of December.

If there was a big star or cloud of doom or other indicator on the calendar that in the middle of December, they were going to have to ramp up production an additional 25 percent to cover that fifth day, that collision course should have been predictable. (That's 25 percent *before* factoring in the nearly 20 percent accounted for by the banked stories.)

COURSE CORRECTION

To follow the maritime metaphor just one more step, this could have been a good time for a course correction. In boating, as in life, gradual course corrections are generally preferable.

By my calculations, doing four shows a week, three stories per show; each story represents a little more than 8 percent of the story production workload for a week.

If they had done one additional story the next week, ramping up story production 8 percent, and another additional story the next, and another additional story the next, by mid-December they would have weaned themselves off the banked stories and in fact would have put stories back in the bank.

As far as story production was concerned, going to a fifth day a week would have been no big deal; they would already be on that story production pace.

This is really nothing new. Any manager worth his salt is making course corrections all along with his budget. If you find that in the first part of the fiscal year you're spending more than one-twelfth of your budget a month, you're going to have to correct course; in fact, you're likely to be told you're going to have to correct course.

Making that correction in the third month of the fiscal year gives you 10 months to spread it out. It should be relatively painless. Let the problem fester until the final quarter, and it can be very painful to fix.

And, it may cost you your job to boot. ■

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

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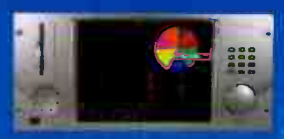

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World Radio History

Videogames

CONTINUED FROM PAGE 40

Lowenstein also urged producers to create better story lines and more socially conscious plots.

At Digital Media Wire's conference in suburban Washington, D.C., about a month after E3, several panelists reflected on the fallout from the loud Los Angeles tradeshow.

Douglas Lowenstein, president of ESA addresses a gathering at E3.

Michael Vorhaus, managing director of Frank N. Magid Associates, a New York, N.Y.-based media research firm, showed new data that underscored the growing diversity of the videogame audience. It is no longer just the stereotyped adolescent males market. Vorhaus's data pointed to spikes in use among males in their 30s and also in young women—especially those in their late 20s and 30s.

"As you're able to create more cinematic experience, it will lead to more interactive entertainment."
—Ralph Rivera, America Online Games

Indeed, the games audience is as diverse as the games themselves, with some demographics (such as young mothers) leaning toward casual usage of quizzes and non-competitive games, while young (and some older) males still favor the intensity of graphics-rich programs. The diversity—or more accurately, divisions—of the industry also stem from the various platforms. MMOGs (the multiplayer online games) are less likely to include HD graphics in the immediate future, according to a consensus of the Digital Media Wire games panel. But that won't hinder the avalanche of intense visuals from the Xbox 360, PS3 and other CD or DVD-based games.

Story telling factors also play a major role in the next generation of games.

"As you're able to create more cinematic experience, it will lead to more interactive entertainment," said Ralph Rivera, vice president and general manager of America Online Games. He cited the emerging creation of story lines "that make you laugh and cry"—not just blast and speed—as a factor in which "Hollywood has an advantage."

But Rivera warned that Hollywood's presence may "just drive up the costs" of games. Other panelists acknowledged that, as game development costs climb toward $25 million per title, payback becomes more challenging.

Despite such hurdles, videogames developers are finding even more reasons to diversify their offerings and seek a greater—and more visible role (if that's possible)—on the entertainment landscape.

And that's a reason for the videogames industry to make plenty of noise. ■

Gary Arlen is President of Arlen Communications Inc., Bethesda, Md. He can be reached at garyarlen@columnist.com.

World Radio History

Reception

CONTINUED FROM PAGE 38

plus the picture IF of 12.75 MHz would equal the LO frequency of 188 MHz. The receiver also would have responded to an interfering signal at 188 + 12.75 MHz = 200.75 MHz, but this is in Channel 11, so interference would have resulted from such a low IF. The receiver IF had to be moved up again. With a picture IF = 25.75 MHz, the LO to receive channel 7 = 201.00 MHz and the image frequency is 201.00 + 25.75 = 226.75 MHz, which is why the high VHF band could not have been extended.

When the UHF band was opened in 1952, the receiver IF had to be increased again, this time to 45.75 MHz for the picture. It can be shown that Channel 29 will cause image interference to receivers with this new IF, so the UHF taboos, n+14 and n+15, were adopted by the FCC to prevent IF interference. The FCC did not mandate the new IF, but all manufacturers voluntarily adopted it to avoid marketplace disasters.

You might be asking, "Why didn't they go to a sufficiently high IF in 1952 as they had done in 1946?" Let's do the numbers.

The UHF band in 1952 extended to Channel 83, (884-890 MHz). The IF would have to be above Channel 13, e.g., 230 MHz. The limitations of vacuum tube technology at that time prevented a high enough IF except for military radars, a few of which had 200 MHz IF late in World War II.

Even today, the cost of an IF amplifier flat over 6 MHz and centered around 230 MHz would be unacceptable. So the FCC did what it had to do, establish the UHF image taboos we still know as n+14 and n+15.

DUAL TUNER DESIGNS

This brings us to double conversion tuners like the type Zenith designed for testing its 8-VSB DTV modulation technology. It was the outstanding interference rejection of *that* double-conversion tuner that led the FCC to conclude that the UHF taboos did not apply to DTV. The performance of that double-conversion tuner became the basis for the DTV planning factors that enable DTV broadcasting in those vacant channels within existing broadcast spectrum.

A double-conversion tuner is a cascade of two single-conversion tuners. The first frequency conversion results in the desired signal being *upconverted* to the first IF. The first IF signal is filtered to reject image frequency interference. Zenith chose 915 MHz for its first IF, a frequency above the UHF broadcast band.

To tune Channel 2, (54-60 MHz), the first LO was tuned to 915 + 57 = 969 MHz. The image frequency would be 969 + 57 = 1,884 MHz up there in the microwave region. This was easily filtered by a low-pass filter at the tuner input port because of the 2:1 difference in image frequency and the filter cutoff frequency (800 MHz).

It was the outstanding interference rejection of that double-conversion tuner that led the FCC to conclude that the UHF taboos do not apply to DTV.

After the first IF filter, the desired signal was heterodyned to the receiver's second IF of 44 MHz by a second LO operating at a fixed frequency of 915 + 44 MHz. Most of the signal amplification is done at the lower IF.

However, to my knowledge, no TV manufacturer uses a double conversion tuner, probably because of cost and the fact that need for such interference rejection has not yet become apparent in the marketplace.

To be fair, tuner designers know that the choice of the first IF frequency is always a compromise. It must be above the UHF band, but no matter what frequency is chosen, there lurks the danger that somewhere that frequency is being used, but not by broadcasters, and that the undesired signal will pass through the first IF filter to cause interference.

REDUCING TUNER COSTS

The only way to reduce tuner costs is by integrating the circuitry. In the case of a tuner, the active elements, transistors for amplification and diodes for mixers, are readily integrated along with interconnections. What cannot be integrated are the inductors for tuned circuits, so tuner designers seek inductorless circuit approaches.

The first IF filter in the Zenith double-conversion tuner was a bandpass filter at 915 MHz realized as a surface acoustic wave filter, which can be fabricated as an IC on a piezoelectric substrate, usually Lithium Niobate. This is a two-chip solution to the tuner problem, but the market demands a "tuner-on-a-chip" solution for cost reasons. Single chip solutions are known.

One of these is called the zero IF superheterodyne, also known as a direct-conversion receiver. DTV signals cannot be detected by a simple envelope detector; they must be detected synchronously. Locked-in LO frequency and phase to the received signal's pilot carrier is required.

Tektronix first employed synchronous detection of TV signals in its famous NTSC measurement grade demodulators in 1973. All DTV receivers have circuitry to produce the needed carrier locked to the pilot carrier, so why not feed the locally generated pilot carrier frequency into the mixer?

The output of this mixer would be a baseband (demodulated) DTV signal. Its spectrum would extend from DC up to 5.38 MHz.

What about the IF filter? There is no need! Its function is replaced by the low-pass (anti-aliasing) filter used to filter the baseband signal before it reaches the analog-to-digital converter. But without an IF filter, what about first adjacent channel signals—what rejects them? First, lets deal with the upper adjacent channel interference problem.

The pilot frequency of that undesired DTV signal will be at 6 MHz in the baseband signal. The low-pass filter should attenuate this undesired pilot at 6 MHz and all of its sidebands, which extend up to 11.38 MHz.

The lower adjacent channel presents a very different problem. Its pilot is 6 MHz below the local oscillator frequency, so it appears at 6 MHz in the baseband signal. The low-pass filter should remove *both* adjacent channel pilots, but the sidebands of the *lower* adjacent channel DTV signal will appear within the spectrum of the demodulated signal and cannot be removed. This is a critical drawback of the direct conversion topology for our 8-VSB DTV signal, which was brought to my attention by my friend, Dr. Oded Bendov.

But why worry? There is at least one direct conversion tuner-on-a-chip IC commercially available for the European DVB-T signal. Is it only a matter of time before someone introduces a direct conversion tuner-on-a-chip IC for use in North America? Would it work?

Yes, except where there is a lower adjacent channel also in use in the locality. Would such a DTV tuner meet the requirements set forth by the FCC? I have no idea; I'm not a lawyer. Perhaps this column will alert some of the people who might be working on such a tuner-on-a-chip for 8-VSB based upon direct conversion.

Is there any other way to build a DTV tuner-on-a-chip that would eliminate image interference? I believe there is! Special mixers have been built in the form of a microwave monolithic IC device with image rejection mixer circuitry on the chip. In a conventional frequency converter, the LO frequency is above the desired signal frequency, so it is below the image frequency.

The difference frequency spectrum at IF is therefore inverted, i.e., the pilot is at the high end of the IF spectrum and the sidebands are now inverted too, so what you have at IF is a lower sideband signal, plus the pilot offset in frequency.

However the image frequency signal at the mixer output is not inverted, therefore it should be possible to separate the desired signal at IF from the image frequency interference. An IC designed for our 8-VSB system could offer a powerful solution at a very low cost, a cost which should follow Moore's Law downward 2:1 per 18 months.

Is anyone out there working on an image rejection tuner for 8-VSB? I hope so. Is anyone out there working on a zero IF or direct conversion tuner for 8-VSB? I hope not. ■

Charlie Rhodes is a consultant in the field of television broadcast technologies and planning.

He can be reached via e-mail at charleswrhodes@worldnet.att.net.

World Radio History

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World Radio History

USER REPORT

Quincy Switches with Leitch

by Jim Lawrence
Director, Operations and Engineering
Quincy Broadcasting Company

QUINCY, ILL.

From studios overlooking the Mississippi River, Quincy Broadcasting Co. operates two radio stations and two television stations that serve 25 counties across Illinois, Missouri and Iowa.

Currently, we operate two local television stations, WGEM-TV (NBC) and CGEM-TV (Fox); a standalone cable TV channel programmed by WGEM; and the master control operations for our sister station in South Bend, Ind., WSJV-TV (Fox), all within one control room facility.

When we made the recent jump from analog to digital, we needed to take care of the switching of our numerous signals, which were now all digital. We looked for a powerful solution that offered the features we wanted, but was also compact enough to easily fit into our limited space. We did not want to invest in old technology or in old-style master control switchers, so we surveyed the market and selected the PanaceaClean/Quiet routing switcher from Leitch.

(L to R) Richard Voss, master control room operator and Jim Lawrence, monitor master control of three Quincy Broadcasting stations.

SWITCHING ON HD

Delivering master control features at a router price, the Panacea Clean/Quiet switch performs buffered switching on HD and/or SDI signals with embedded audio, ensuring that the switch between the two signals is perfectly timed to be on a frame boundary. This serves to remove the video bounce often associated with vertical interval switching, as well as the audio pops and clicks associated with audio switching in the vertical interval.

Given its small footprint and rear-rack mounting capabilities, the Panacea platform is ideal for space-constrained operations that require full local and remote control capabilities in a routing solution. In addition, the Panacea Clean/Quiet switcher allows users to customize its operation.

To manage the switching of signals for our two local stations, we purchased two of the 16 x 2 Panacea Clean/Quiet routing switchers, which are controlled by our DTG automation system. We are also setting up some of the router's Web-based features for our station in South Bend using the Panacea Web control software, which provides direct-to-the-frame Internet access to Panacea routers via any Internet-enabled device through any standard Web browser.

We like the Panacea Clean/Quiet feature that allows us to set transitions between events. The Panacea Clean/Quiet offers a variety of video transitions with variable transition rates, including dissolve, "V" fade, cut-fade, fade-cut and cut. The fade rate of the transitions can be configured for full customization. We use a short dissolve when transitioning between events—it looks great and beats the hard-cut any day. Our operators also have the option to manually switch to live feeds via the local or remote routing control panels in the event of a news interrupt or live weather bulletin.

SAVING SPACE

Another feature I really like about the Leitch router is that the remote switcher panel only takes up one rack unit. When you try to fit the master control room puzzle together, it fits exceptionally well. Just install the switcher and configure the inputs, and the Panacea Clean/Quiet switch sits there quietly doing its job.

Since acquiring the Panacea Clean/Quiet switch, we have already benefited from the company's efforts to continuously improve its products to meet customers' changing requirements. We are currently transitioning to centralized master control room operations, and the RCP-32x8CQP control panel Leitch recently released will enable us to have full networked control of our sister station in Indiana from our Illinois facility.

Having Leitch products in our station for many years, we've had many interactions with the company's technical support staff, and they have always been extremely easy to work with. ■

Jim Lawrence is the director of operations and Engineering for Quincy Broadcasting Company and can be reached at jlawrence@wgen.com. *The opinions expressed above are the author's alone.*

For more information contact Leitch at 800-231-9673 or visit www.leitch.com.

World Radio History

Routing and Master Control Switchers

Pro-Bel

5 Hub Dr.
Melville, N.Y. 11747

The following is a compilation of opinions solicited from users of the month's featured product, as well as general specifications and other pertinent information.

KEY FEATURES

- Analog and digital switchers
- Routers up to 512 x 512 and beyond
- Support for both SD and HD
- Scalable and expandable

	Carl Guffy WDJB 410-749-1111	John Harvi CUNY 212-817-7575	Michael Martin WUSF 813-974-4000
USER			
WHAT MODEL(S) DO YOU HAVE?	Three Eclipse TX-420	TM routing system 24 x 24	Sirius router, Icon terminal gear
HOW IS IT USED?	Switch analog station and HD output	Routing broadcast content	Routing broadcast content
HAS IT PERFORMED AS EXPECTED?	Yes	Yes	Yes
WHAT FEATURES DO YOU LIKE THE MOST?	We use two control panels and each of them can access the switchers.	They build a basic set of frames, very flexible.	The company, they're quick to respond.
WHAT FEATURES DO YOU LIKE THE LEAST?	Occasional "sticky" buttons	None	None
HOW LONG HAS IT BEEN IN SERVICE?	Three years	Nine years	A little over a year
HAVE YOU HAD ANY EXCESSIVE MAINTENANCE PROBLEMS?	No. Issues with embedders were resolved by Pro-Bel. Very satisfied	No. So trouble free, very reliable	None
HOW WOULD YOU RATE THE MANUFACTURER'S SERVICE/SUPPORT?	Outstanding service and support	Very good	Pretty high
WHERE WAS THE EQUIPMENT OBTAINED?	Direct from factory	Shipped from U.K.	Through the Whitlock Group
WHAT WAS THE DECIDING FACTOR FOR YOUR PURCHASE?	Trust in the organization, sales and service	Our longstanding relationship with the company	The personality of the company, installation and support

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USER REPORT

3ABN Routes With Ross

by Moses Primo
Director of Broadcasting Operation and Engineering

WEST FRANKFORT, ILL.

Three Angels Broadcasting Network is a 24-hour Christian television and radio network with a focus on preaching and teaching family, health and religious issues. We are the second largest religious owners of low-power TV stations in the United States, and our signal is distributed all over the world in several languages.

MANAGING TECHNICAL NEEDS

At 3ABN, I handle all current and future technical requirements and work on developing the global growth of the network. I also manage the engineering department, IT, overseas development, corporate cable agreement negotiations, satellite carriage agreements and 3ABN Latino channel development.

In our Illinois facility, we create all the multi-language content for our programming and stations using four studios and equipment rooms, and two remote trucks. Late in 2002, we decided to add a new Spanish-language channel and start translation simulcasts for several channels. Therefore, we needed the flexibility of moving our signal around the facility, and it was time to replace our router.

SELECTING A ROUTER

After researching routers from different manufacturers, Ross pulled ahead—its routers met all our technical requirements. In January 2003, we purchased a Ross Routing System with a Ross Synergy, three digital production switchers and dozens of RossGear conversion terminal products. By packaging everything, we were able to save money and still have all the features, options and products we wanted. Our previous experiences with Ross products and our relationship with its sales and technical staff helped cement our decision.

Moses Primo, director of broadcast operation and engineering in the equipment room at 3ABN, with the Ross routing system.

For our routing needs, we chose two Kondor facility routers with the Geneos control system and control panels. The 64 x 64 router handles all video with SDI, and audio with AES/EBU and analog matrices, while another 32 x 32 router does the same in another area. The Geneos control system assists our management of signals, which are selectable through multiple RCP-251, RCP-SK1, and RCP-SN control panels.

Our equipment was provided through Ross Video in good time. Engineering and installation was completed by our systems integrator without a hitch, and Clayton Benz, who handles technical support at Ross Video, completed our commission, which also went very well. Purchasing a Ross routing system and dealing with Ross Video as a company has been an excellent experience. ■

Moses Primo is the director of broadcasting, operation and engineering, 3ABN World Headquarters and he can be reached at moses.primo@3abn org. *The opinions expressed are the author's alone.*

For more information, contact Ross Video at 613-652-4886 or visit www.rossvideo.com.

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USER REPORT

PESA 'Pax' Punch

by Alan Perry
Team Lead for the Electro-Optical Tracking Systems Section at the Pax River Naval Air Station

PATUXENT RIVER, MD.

The electro-optical tracking systems section of the U.S. Navy test center has a variety of responsibilities, one of which is to run video control at the Naval Air Warfare Center (NAWC) Atlantic Test Range.

The Pax River facility is one of the NAWC divisions responsible for the design, development and engineering of aircraft, avionics, air-launched weapons, electronic warfare systems, cruise missiles, unmanned aerial vehicles, launch and arresting gear, training equipment and facilities, and other equipment related to Navy and Marine Corps air power. The station is also home to the Navy Test Pilot School.

We're located on Chesapeake Bay, with an over-water test range that includes restricted air space off Wallops Island, Va., and the Atlantic Ocean. My group is responsible for collecting visual documentary data from the range's ground tracking stations, which are equipped with cameras and high-power telescopes that allow engineers to monitor aircraft and aircraft systems as they are tested. The resulting video is distributed via PESA routers to video control room display and recording systems, the main control room's display monitors and flight test consoles, telemetry project engineering stations, and to offices and conference rooms.

DISTRIBUTION SIGNALS

Prior to integrating PESA Cheetah and Tiger systems into our plant, which we accomplished over the past couple of years, we had been relying on a 25-year-old routing system to move video throughout our facility. As our instrumentation and graphics systems became more complex, the infrastructure we had in place could no longer support effective distribution of the varied video signals we

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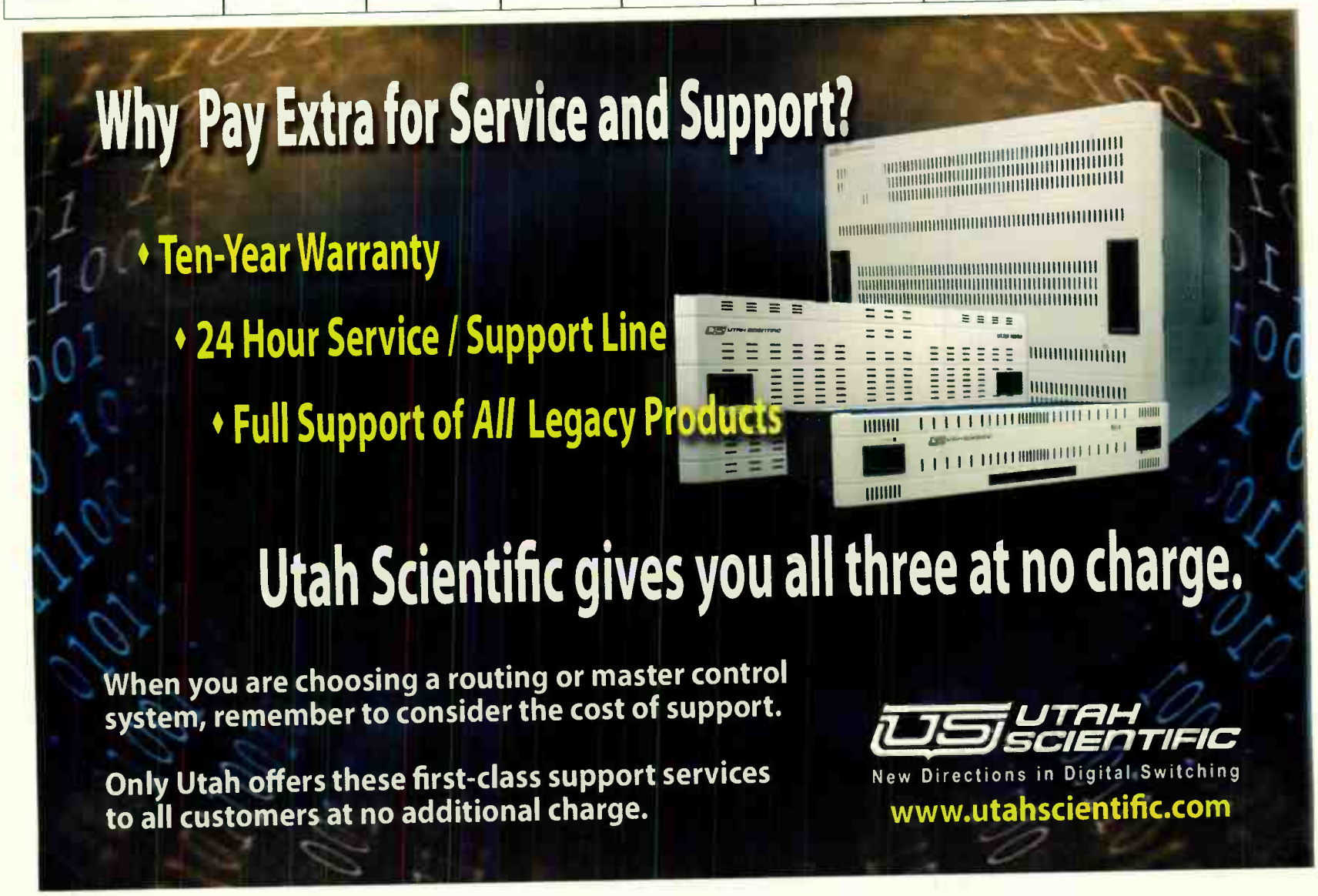
KEYERS

REFERENCE GUIDE

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

MANUFACTURER	MODEL	TYPE	NUMBER/TYPE OF INPUTS	NUMBER/TYPE OF OUTPUTS	FEATURES	OPTIONS	SIZE	PRICE
Broadcast Video Systems 905-305-0565 *www.bvs.ca*	Masterkey 7	SDI linear keyer	Program, key & fill inputs, all SDI SMPTE 259M, BNC, 75 ohm	2-program-2 preview ouputs all SDI, BNC 75 ohm	10- and 12-bit processing, preview output, mixes and wipes	4-input, 2-level key/fill switcher with GPI & memory	1 RU chassis	$4,990
For-A 714-894-3311 *www.for-a.com*	DSK-70HS	Multi-bitrate, HD or SD, linear	Line, line key, fill and key, and gen lock	PGN (full) and pattern options PVW (key)	Emergency backup to broadcast PGM	Remote control unit (DSK-100RU), single or dual rackmount lit	1 RU half-width	N/A
Miranda Technologies 973-683-0800 *www.miranda.com*	Imagestore HDTV	SD or HD keyer, video mixer, DVE, audio mixer	One program, one preview; HD	Two to six mixer inputs, one-two fill and key input	Internal graphics storage, keyers, 3D or 2D DVE options	DVE. audio mixing and voice overs, animation, still clock, EAS insertion	2 RU	N/A
Pinnacle Systems 650-526-1600 *www.pinnaclesys.com*	DVEXCEL	Chromakey and linear keyer, SD	3 internally routable video inputs per channel	Up to 4 channels; 1 SDI program, 1 SDI key; 1 NTSC monitor	16-bit DVE with up to 4 channels and 12 DVE layers with 4:4:4:4 processing	DVEXCEL shotbox analog I/O module, additional DVE control panels	4 RU	N/A
Ross Video 613-652-4886 *www.rossvideo.com*	CDK-111A-M	SD digital mixer/linear keyer	4 SDI inputs with full frame synchronizer	2 SDI outputs (PGM/PRV or 2xPGM), bypass relay	Simultaneous A/B mixing and extenal keying, clip/gain and box mask settings	GPI; automation editor interface; USB transfer S/W	Gear module (card) 10 per 2 RU	$2,495
Snell & Wilcox 408-260-1000 *www.snellwilcox.com*	TrikKey	Digital SD	3 SDI key, 3 SDI key fill, SDI A/B background	1 SDI program 1 SDI preview Cardioid	Three downstream keyers over a background	Output module, bypass module	1 RU	$12,180
Ultimatte Corp. 818-993-8007 *www.ulltimatte.com*	Ulltimatte HD	Digital, linear	Four 10-bit SDI	Two 10-bit SDI	Soft edge windows, flare suppression controls, ambience	Every HD format	1 RU	$ 85,000



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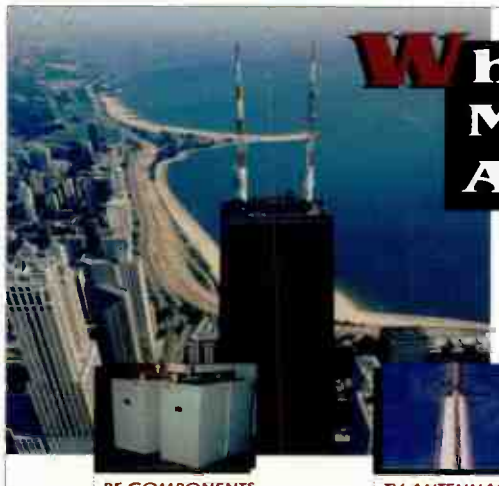

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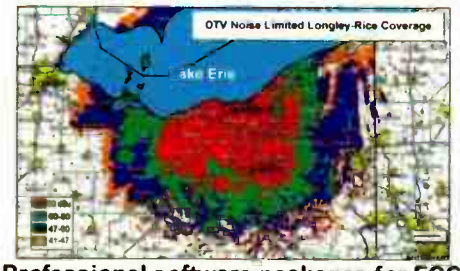

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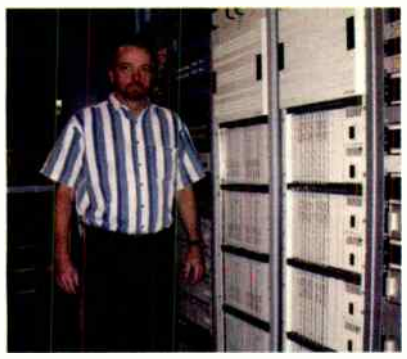
USER REPORT

KTBS Upgrades With Utah Scientific

by Rick Hartford, CSTE
Assistant Chief Engineer
KTBS-TV/KPXJ-TV

SHREVEPORT, LA.

KTBS-TV is an independently owned ABC affiliate serving the Shreveport area. We are a market leader in local news and will celebrate our 50th anniversary this year. We operate a UPN affiliate station, KPXJ-TV, which shares facilities with KTBS. In addition to the normal local affiliate programming, we carry a full schedule of sports coverage including LSU football, basketball and baseball games.



Rich Hartford, assistant chief engineer at KTBS/KPXJ-TV, with the KTBS-TV router racks, which hold two generations of Utah Scientific routers.

Our station has had a central routing switcher, the AVS-1B from Utah Scientific, for many years. When it came time to add a digital router to the system, we naturally went to Utah Scientific. They were able to provide us with just what we needed—a modular SDI/AES router with easy expansion and the ability to grow into HD.

COMPATIBILITY

The new UTAH-400 was fully compatible with our existing Utah router and control system. This meant that we could keep our familiar control panels and add the digital equipment to the routing system in a way that was completely transparent to our operators.

Our new system has 144 x 144 digital video and audio frames. The video frame has a small HD section, which we'll soon expand. This system is connected to our AVS-1B analog switcher by 11 tie-lines that allow us to select any analog source to our digital destinations.

With our new switcher in place, we have been able to continue adding digital equipment to our system while keeping the operational procedures as simple and familiar as possible. This has paid big dividends in avoiding operator confusion and mistakes.

We have been very happy with the products from Utah Scientific. They are well designed and extremely reliable. But even more important is the quality of service and support that Utah has always offered us.

The company's 10-year warranty is evidence of its commitment to support, but we are more impressed by the efficient, hassle-free way that the Utah customer service techs take care of any questions or problems that we may have. This high level of support is one of the main reasons that we decided to stay with Utah for the digital expansion project. ■

Rick Hartford, CSTE, is the assistant chief engineer at KTBS-TV / KPXJ-TV and can be reached at rhartford @ktbs.com. *The opinions expressed above are the author's alone.*

For more information, contact Utah Scientific at 801-575-8801 or visit www.utahscientific.com.

USER REPORT

Network Electronics Lights Up Hammons Field

by Matt Gifford
Vice President and General Manger
Springfield Cardinals

SPRINGFIELD, MO.

I've served as vice president and general manager for the Springfield Cardinals since the club's inception, after working nine years with the St. Louis Cardinals.

Hammons Field is a new $32 million, 7,500-seat ballpark in downtown Springfield, Mo. The stadium, completed in April 2004, is home to the minor league Springfield Cardinals—the Double A Texas League affiliate of the St. Louis Cardinals—and the Southwest Missouri State University Bears. The facility is the centerpiece of the Jordan Valley Park midtown development project. It contains 28 luxury suites that can accommodate 18 people each, plus a level of party suites and press boxes.

The Cardinals ownership group, along with Springfield businessman John Q. Hammons, has already implemented numerous upgrades to the nearly new stadium in an effort to elevate it to a professional level. Chief among the improvements is the $1 million video board, which is billed as the largest and best in Minor League Baseball.

The Springfield Cardinals use a Network Electronics VD1616 switcher to route SDI signals throughout the production system.

FEEDING THE SCOREBOARD

An elaborate production system with numerous components was required to feed video to a scoreboard the size and magnitude of the one at Hammons Field. We turned to Sounds Great/SG Integration for that company's expertise and integration services to put it all together. In turn, Sounds Great specified a comple-

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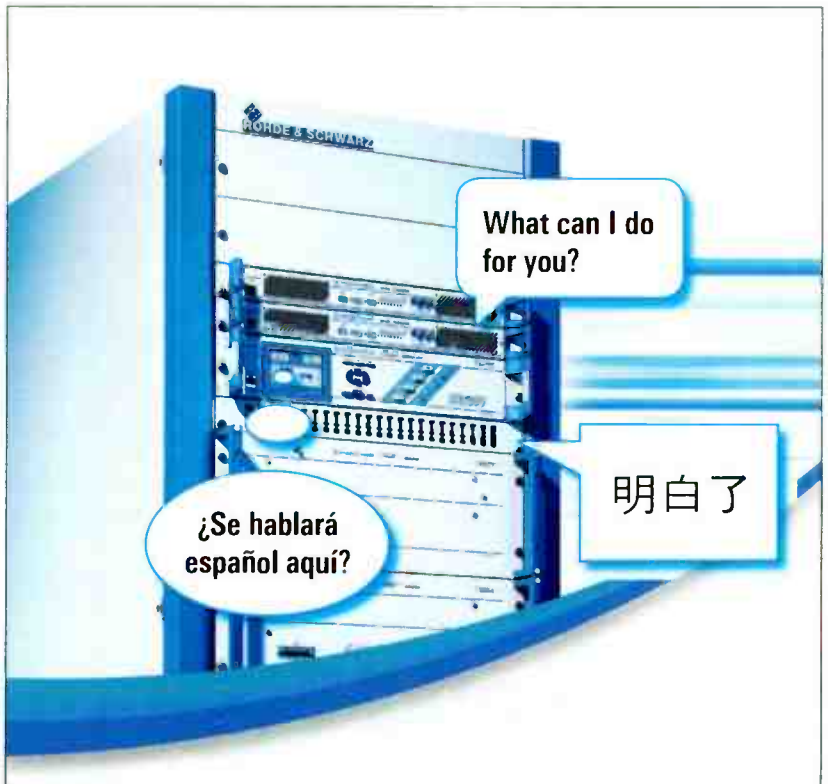
World Radio History



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COMPANY PROFILE

Evertz Readies for The HD Future

by Lauren Evoy Davis

BURLINGTON, ONTARIO

Founded in 1966, Evertz Microsystems has been a David among Goliaths, small but making inroads in the marketplace by hitting its targets.

The company manufactures video, audio and film equipment used by broadcasters and post-production facilities and recently received credit for engineering contributions in "Star Wars Episode III: Revenge of the Sith."

While Evertz may be well known for timecode products, it provides a wide range of SD/HD digital broadcast products, including routers, keyers and logo inserters, converters, film systems, fiber optics, monitoring solutions and closed captioning gear.

"Evertz was synonymous with timecode, but it is much more than that," said Orest Holyk, Evertz product development manager. The company is now more synonymous with HDTV, he said.

ESPN has outfitted its new HD facility in Bristol, Conn. with the Evertz modular fiber line as well as a large number of MVP multi-signal monitoring and display systems into its audio and video production control rooms.

With interest in HDTV growing in Europe, Holyk expects the company's auto-sensing gear to be of key interest to attendees at IBC in September, along with monitoring, distribution and conversion products.

For example, the HD Quattro 776VIP4 signal monitoring module accepts, auto-detects, analyzes and displays four asynchronous HD/SD/analog video signals on the same display and offers other built-in features.

RAPID EXPANSION

Holyk attributes the company's success to its strategic planning, development and customer support.

With in-house SMT equipment, the company has its own version of "lean" manufacturing, offering low cost and high yield advantages, which has helped it expand from a 20-person crew in the late 1990's to a company that now has more than 300 employees and sales offices in its home base of Ontario, Canada, as well as in Burbank, Calif., where the sales staff focuses on post-production in New York, Washington, the U.K. and Beijing.

Since new management took over the company about eight years ago, Evertz experienced a rapid expansion, moving from an 11,000 square-foot facility in Burlington, Ontario to a 30,000 square foot building. The company has since expanded to an 85,0000 square-foot building but remained at its current location, housing engineering, design, manufacturing, testing, quality control and administration.

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MVP

In the past two years, Evertz has developed a product line that sticks with a modular, configurable design base philosophy and developed the MVP multi-input display and signal monitoring system.

Holyk said MVP can grow as the broadcast facility's needs grow.

The MVP product line includes flexible display solutions for multiple video, audio and data inputs. MVP removes the need for separate CRT displays, routers and DAs and combines video, audio and data information onto a single, dual, quad or multi-output display. The video source information, such as the under monitor display (UMD) and other on-screen display "window dressing" like audio bar graphs, faults and tallys associated with the video can simply be moved around the wall as needed by the operator.

It allows easy setup along with preset selection. Perhaps a technical director wants to see something different from its current setup. No problem, according to Holyk; since it's no longer a fixed installation, it can be changed with the click of a button.

Evertz first installed MVP at San Francisco-based PBS broadcaster KQED in 2003 and now drives more than 1,000 displays globally. ■

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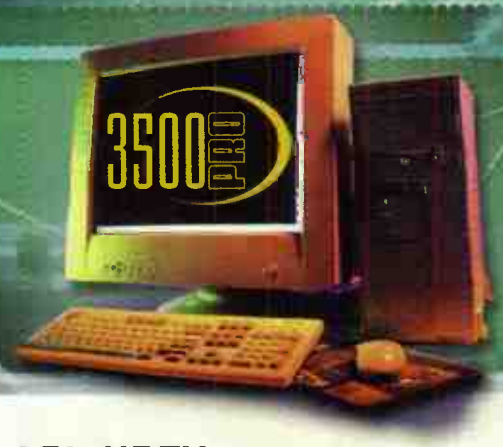

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USER REPORT

Cincinnati Reds Score with Grass Valley

by Russ Jenisch
Scoreboard Operations Manager
Great American Ballpark

CINCINNATI

In today's video-savvy world, coming to the Great American Ballpark should be about the in-park experience as well as the game on the field. That's why, as scoreboard operations manager, I knew we needed the flexibility and expandability that digital affords to take our productions to the next level. The search for the equipment to meet our needs led to Grass Valley.

The complex A/V elements on display are made possible by a collection of production equipment, including a Grass Valley PVS 1106 Profile XP Media Platform server for instant replay and highlights, a Zodiak 2 M/E production switcher and a pair of Concerto Series routing switchers, controlled via a Grass Valley Encore unit. The scoreboard control room—on the press level of the stadium—feeds approximately 500 video monitors throughout the ballpark. Grass Valley 8900 Series modular products are used to convert and stabilize and enhance the video signals.

Grass Valley gear is used to store, switch and route signals for the scoreboard at The Great American Ballpark, home of the Cincinnati Reds.

MULTIFUNCTION

The Grass Valley Concerto routing switchers are among our most important pieces of gear. They help us in our pre-production, post production and game day production to produce and distribute quality signals to and from our equipment to various destinations throughout our production facility and throughout the ballpark.

The dual Concerto multiformat routers are used for two functions—production and distribution of the various video and audio signals to the video boards and sound system in the ballpark; and in the coaching video area, a separate video facility located behind home plate that routes, records and plays back isolated camera feeds for pitcher and batter analyses.

A single control system linked via Ethernet connectivity controls the 64 x 64 I/Os of one Concerto system and the 32 x 32 AES audio signals and 32 x 32 analog audio elements associated with the other.

The dual Concerto 64 x 64 router is used in the production of 30-second spots, highlight videos, and myriad in-game elements via a post-production area featuring two Avid editing systems. We host corporate events and live concerts that need video support as well. This is all possible because the Concerto router enables the mixing of digital and analog audio and video formats within a single frame. The Grass Valley aspect ratio converters enable us to incorporate mixed formats—4:3 and 16:9—into a single distribution format.

Operating the video board during games is a huge production, as we incorporate up to nine live standard-definition cameras (four Sony and one Ikegami, which my crew operates, and four camera sources fed by the local rights-holder). Replays and pre-produced materials are played back on one of 10 playback devices. All of this has to happen with precision to comply with MLB rules on motion on the display boards while a batter is in the box and to entertain our fans. It is imperative to have reliable, dependable and high-quality distribution equipment.

FLEXIBILITY

Our Grass Valley PVS 1106 Profile XP Media Platform server is included in our mix of playback devices. The Concerto router gives us the flexibility to isolate various camera feeds into those devices, so that we can use a BPS (button per source) control panel to choose the individual audio and video signals we want going into each individual deck.

We need not only to send a signal out live to various destinations, but to also produce content that we distribute on videotape, DVDs and into our Profile XP server.

The 64 x 64 I/O channels on our main Concerto router are now maxed out and we may have to expand even further sometime next year. The Grass Valley Concerto routing matrix is easily expandable and will require only four cards to reconfigure our 64 x 64 router to a 128 x 128 matrix.

Our maintenance agreement with Grass Valley has really come in handy. The company has continued to provide us with new software upgrades for the Concerto system, including a recent capability that allows us to separate the audio from the video for post production.

We give the routers a workout most days and it has never failed us. ■

Russ Jenisch is the scoreboard operations manager at the Great American Ballpark in Cincinnati and can be reached at rjenisch@reds.com. *The opinions expressed above are the author's alone. For more information contact Grass Valley at 503-526-8160 or visit* www.grassvalley.com.

BUYERS BRIEF

The Dagger product line from **Sigma Electronics** is a series of economical, SD and HD video and AES audio routers designed to fit into a single modular frame.

The routers' unique design enables multiple layers of 16 x 16 compact audio and video routers to be combined in the same frame, enabling a wide diversity of switching for any size facility and housed together in a space-efficient frame. The modules provide a wide variety of signal formats, including HD/SDI multi-format, SDI and AES. All HD/SDI and SDI routers include input equalization and reclocking of all outputs.

For more information, contact Sigma Electronics at 866-569-2681 or visit *www.sigmaelectronics.com*

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World Radio History

USER REPORT

WWNY, WNYF Take Miranda Route

by John Seymour
Director of Broadcast Operations
WWNY/WNYF

WATERTOWN, N.Y.

In 1954, CBS affiliate WWNY-TV (Channel 7) was launched with a live television broadcast from a tiny 32-by-30-foot studio, More than 50 years later, WWNY-TV features more than four hours of news a day and is broadcast alongside WNYF Fox 28 from an all-digital facility serving northern New York State.

When United Communications Corp., owner-operator of WWNY, received permission to launch WNYF broadcasts in 2001, the company installed a digital infrastructure to support the new Fox affiliate. As part of that upgrade and expansion, our station was among the first to incorporate a Miranda Technologies master control and channel branding system into our operations.

GOING DIGITAL

When we took WWNY digital last year, we added another Imagestore and a Presmaster multichannel master control and channel branding system to the facility. WWNY and WNYF share one master control room, with an Imagestore system dedicated to each channel, running alongside Harris automation, a four-node SeaChange Media Cluster and a Thomson Grass Valley Profile server.

For our CBS programming, much of our play-out consists of national programming, along with our two-hour morning show and midday, evening and 11 p.m. news. Pro- gramming for the Fox channel is different, with two hours of network programming from 8 to 10 p.m., followed by a locally produced newscast. In short, we fill most of the day with syndicated programming using automation to control record scheduling.

We have one person on duty at all times, and using the Miranda switchers along with our server and automation systems help make this possible.

The Miranda Presmaster system allows WWNY-TV to run with one operator monitoring master control.

The Presmaster panel installed in our joint master control room controls one Imagestore system for WWNY and another for WNYF. The system gives our master control operator critical information ranging from channel IDs, voiceover configuration and system alarms, along with control over full-group digital A/B mixing, gain, multiple keying layers for our branding images, and DVE configuration, with storage for up to 8,000 full frames of video and up to 400 minutes of digital stereo audio. The system's soft-screen display puts complete control over transmission within easy control of just one user, with rapid access to sources fed from our router.

The Imagestore is a solid product, and we've been very pleased with how it has developed over the years. The loaded system we use includes a Miranda Easysound digital audio mixer, Easytext character generator and Squeezy DVE options. It features an integrated stillstore that we use for backgrounds, logos, clocks and lower-thirds.

The Presmaster/Imagestore combination works well with our EAS receivers to enable viewer notification in the case of emergency alerts. When an alert comes through, it triggers the Imagestore's CG program and moves the message on-screen. Additionally, the Miranda Imagestore has an integrated DVE squeezeback, which we use with our school closing system.

The functionality the Miranda master control solution gives us today helps us maximize every dollar from our broadcasts. With a market ranking of 175, we're not the largest station, but every broadcaster today faces a shrinking market. We need to be creative in using new and alternative revenue sources. Miranda has been very responsive in helping us maximize the potential of our branding and switching systems in building ad revenues.

During our Super Bowl coverage earlier this year, we used the Miranda system to insert station graphics along with a sponsor logo into pre-game broadcasts. With the Imagestore, one master control operator was able to manage this broadcast feature easily. Right now we're working with Miranda in creating a new, real-time sponsored time and temperature feature.

The functionality of the Imagestore and Presmaster systems and their smooth integration into our operations allows us to run with just one operator monitoring master control. The support we've received from Miranda over the past four years has been excellent, and we're excited about the opportunity to upgrade our Miranda master control systems to HD operation as our broadcasts move further into that domain. ■

John Seymour is the director of broadcast operations at WWNY/WNYF and can be reached at jseymour@wwnytv.net *The opinions expressed are the author's alone.*

For more information, contact Miranda at 514-333-1772 or visit www.miranda.com.

Network

CONTINUED FROM PAGE 53

ment of Network Electronics Matrix switchers and control panels to furnish routing capabilities.

The 35-by-20-foot Barco S-Lite full-color LED display provides fans with high-quality video images, including instant replays, player profiles, game action, cartoon graphics, advertising, and live crowd scenes.

Sounds Great designed and installed the front-end video production suite that supplies the programming for the Barco board. The suite utilizes digital switching, instant replay with slow-motion, 3D video effects ad clip program storage.

Video is fed to the display by a Network Electronics VD1616 16 x 16 serial digital video switcher, which routes SDI signals throughout the production system. The VD1616's data rate of up to 360 Mbps provides us with maximum quality, and its high performance SMD circuits assure us of undiminished signal quality.

The system also uses a Network Electronics V1616 16 x 16 composite video matrix to route composite video to the monitors, and the company's AD0808 8 x 8 AES/EBU digital audio router. The AD0808, like the VD1616 and V1616, uses SMD (surface molecular detection) technology.

Routing functions are all accomplished via Network Electronics Pro X-Y control panels. Our installation includes both a CP-8 and a CP-16. The Pro X-Y series is an X-Y remote control range that offers input select buttons on the top row and outputs on the bottom row. The input buttons have different colors for displaying both video and audio status during breakaway operations. The last selected output is indicated on the LED.

The Network equipment was perfect for Hammons Field because it really allowed us to put on a professional show in a minor league setting with a limited staff. ■

Matt Gifford is vice president and general manager of the Springfield Cardinals based in Springfield, Mo. He can be reached at mgifford@stlcardinals.com. The opinions expressed are the author's alone.

For more information, contact Network Electronics at 1-800-420-5909 or visit www.network-electronics.com.

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World Radio History

USER REPORT

nVision ROCs at Tribune

by Ira Goldstone
Vice President and CTO
Tribune Broadcasting Company

CHICAGO

Tribune Broadcasting Co. operates 26 television stations across the United States, comprised primarily of Fox and WB network stations, an ABC affiliate, and Chicago's flagship WGN Superstation.

As a news and content provider in all the major markets, Tribune also runs two ROCs (regional operating centers) in Seattle and Boston, along with a centralized distribution center and a two-station cluster in Indianapolis.

Each ROC controls multiple television stations, where we centrally create and composite entire program streams, and send them out to the different stations in the group—all from one location. The physical distance to each individual station is not a factor, as the signals are delivered over an ATM (Asynchronous Transfer Mode) network provided by AT&T, enabling the programming to be delivered anywhere in the United States.

As CTO for Tribune, my responsibilities span both IP and broadcast technology. As part of the company's ongoing conversion of our older analog facilities to digital, combined with the associated capital costs, we looked at unique ways to maximize resources with new technology and equipment. This ties in closely with Tribune's overall transition to DTV and high definition, and includes equipment such as video servers, the replacement of tape-based cart systems, and an important requirement for multichannel master control switchers.

MULTICHANNEL, MULTIFORMAT

At each ROC, the master control switcher needs to function as an expandable, centralized hub—and this was one of the key reasons why we selected the nVision NV5128-MC system.

As a switcher with multichannel and multi-control panel architecture, the NV5128-MC resides within an nVision router frame, with master control processing modules and router crosspoint cards side-by-side. The switcher supports both standard- and high-definition formats in the same chassis, provides a choice of control surfaces (hardware-based control panel or GUI) and is designed for expansion.

Jason Hahn, master control operator at WXINIWTTV in Indianapolis, sits at the helm of the station's nVision master control switcher.

Operationally, the NV5128-MC enables us to use multiple control panels, with the ability to assign any panel to any outgoing channel. Instead of having individual master control switchers at each regional station, one ROC-based nVision master control switcher consolidates resources, and eliminates the need for regional duplication of switchers, servers, support electronics and maintenance personnel.

Using the centralized ROC concept with master control at the hub, we've realized significant savings in terms of capital investments and operating expenses—plus we can add channel capacity as required. The NV5128-MC in Indianapolis currently handles two channels, while the switcher in Seattle runs three. At each ROC, we also have the built-in potential to expand to six channels.

KEY FACTORS

Several additional factors contributed to the decision to go with nVision. Primarily, the NV5128-MC provides us with the level of branding that we required, with the functionality and upgradeability that we wanted. In standard form, the switcher includes three linear keys and two logo keys, each of which can be independently assigned from the router matrix.

The switcher also supports Dolby E and embedded audio simultaneously, and performs all decoding and de-embedding tasks internally. This enables us to go with Dolby in one market, embedded in another—and change as required as Dolby becomes more prominent.

The nVision gear has been running fine, for both the operations and engineering staff—it's a very simple switcher to learn and operate. In addition to a technology upgrade from analog to digital, the nVision NV5128-MC has helped us solve equipment and resource issues, and the company has been very responsive to our requirements. ■

Ira Goldstone is the vice president and chief technology officer at Tribune Broadcasting Company. He can be reached at igoldstone@tribuine.com. *The opinions expressed above are the author's alone.*

For more information contact nVision at 530-265-1000 or visit www.nvision.tv.

BUYERS BRIEF

The **Multidyne** VAS-1000 routing switcher for video, audio and monitoring features vertical internal switching of one video and up to three audio channels with a 10 x 1 matrix. The switcher includes one video and two audio breakaways. The VAS-1000's 30 MHz video bandwidth is designed for HDTV, NTSC, PAL and SECAM video signals.

In addition, the VAS-1000 offers loop-through video inputs, four video outputs and optional audio interface panel for XLR connectors. Remote control panels are optionally available which operate at distances of up to 3,000 feet over a standard audio cable without and external power source. Power is supplie to the remote control panels through the control cable.

For more information, contact Multidyne at 516-671-7278 or visit *www.multidyne.com*.

World Radio History

Pesa

CONTINUED FROM PAGE 48

generate. Today, the PESA integrated control system enables our engineers to transport NTSC, RBGHV, and SDI signals across the facility easily and efficiently from a single interface.

Professional Products, a Gaithersburg, Md.-based systems integrator and PESA dealer, first introduced us to PESA routers, and we discussed our system and needs with PESA during several visits to NAB.

Pax River Naval Air Station uses PESA routers to distribute its video for testing aircraft.

We explained what we wanted to accomplish, and the company's engineers have been able to incorporate features into their routing systems to help meet our needs.

PESA's willingness to work with us has been invaluable in improving signal distribution across our facilities. The PESA control software's ability to handle three formats across a common interface has allowed us to integrate management of all our video—from legacy analog video to SDI feeds from newer instrumentation—for more streamlined operations.

A 256 x 256 Cheetah system handles NTSC signals and thereby supports the enormous store of NTSC video accumulated at Pax River over the years. The center's tracking instrumentation was upgraded along with its routing systems, and a PESA 64 x 64 Tiger router handles the SDI signals these systems generate. A second 64 x 64 Tiger system handles RGBHV signals, primarily computer-generated content such as maps.

The PESA 3500PRO series system controller provides a Windows-based user interface to the company's routing switcher control products. It has proved to be a robust control solution that gives our engineers flexibility in configuring multiformat signal distribution.

As we continue to upgrade the infrastructure at Pax River, we'll be using PESA systems once again to build a separate routing system dedicated to secure video transport.■

Alan Perry is the team lead for the Electro-Optical Tracking Systems Section at the Pax River Naval Air Station and can be reached at kevin.perry@navy.mil com. *The opinions expressed above are the author's alone.*

For more information contact PESA at 256-726-9200 or visit www.pesa.com.

BUYERS BRIEF

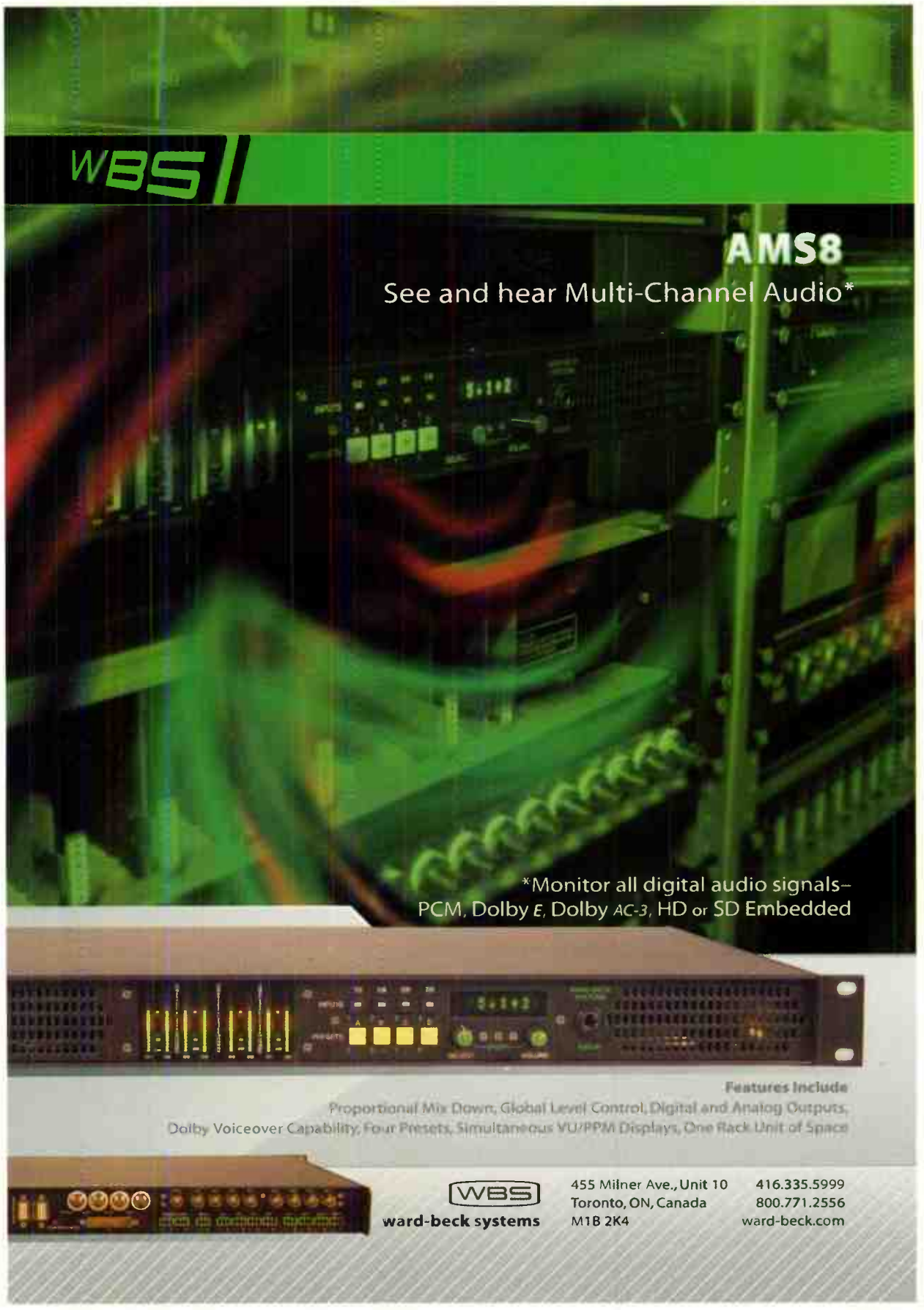
The **Knox Video** RS16x16 HD is a high performance full matrix routing switcher in a 6-unit rack-mount chassis.

The RS16 x 16 accepts and routes mono or stereo unbalanced audio, giving operators many options for switching.

Other highlights include breakaway stereo audio, flat to over 100 MHz, store/recall up to 16 patterns, manual and RS232 control and vertical interval switching. Composite, Y/C and component versions also are available.

Operators can use the front key panel key pad or send routing commands from a terminal or computer to RS232 interface.

For more information, contact Knox Video at 301-840-5805 or visit *www.knoxvideo.com*.



World Radio History

BUYERS BRIEF

The 5430 8 x 1 digital video router module from **Ensemble Designs** fits in any slot of either the 1RU or 3RU Avenue signal integration system. The module targets small routing applications such as monitoring, QC and graphics rooms.

The 5440 module physically connects to the 5430 to make an 8 x 8 digital video router and can be used in the Avenue 3RU frame. The 5440 also provides an analog monitor ouput which can track any of the eight serial output buses. An On Screen Display (OSD) text overlay indicates source and destination names and crosspoint configuration.

The router modules can be controlled through a touch screen panel, Web browser, Avenue PC or the Avenue external X-Y router control panel. The X-Y control panel interfaces to the 8 x 1 or 8 x 8 configuration, connecting the module's rear D connector.

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

For-A offers three routing switchers tailored to broadcasting. The RS-HD multi-bit-rate video routing switcher supports HD-SDI or SD-SDI video-based systems. It comes in 8 x 8, 16 x 2, 16 x 8, 16 x 16, 32 x 2, and 32 x 32 models.

The RS-V video routing switcher provides signal routing support for analog composite video-based systems. It comes in 8 x 8, 16 x 2, 16 x 8, 16 x 16, 32 x 16, 32 x 32, and 48 x 48 models.

The RS-A analog audio routing switcher provides signal routing support for analog audio-based systems. It comes in 8 x 8, 16 x 2, 16 x 8, 16 x 16, 32 x 16, 32 x 32, and 48 x 48 models.

For more information, contact For-A at 714-894-3311 or visit *www.for-a.com*.

The **Sony** HDS-X5800 router is an ultra-compact 22RU multi-bitrate switcher that supports all digital formats, including 1080/24p and DVB/ASI signals. Up to 264 inputs and 272 outputs handle signals from 143 Mbps up to 1.5 Gbps. The HDS-X5800 can be expanded to a 1056 x 1088 matrix by cascading multiple frames.

Other highlights include: flexible input and output configurations, increments of 33 inputs and/or 34 outputs, auto cable equalization, auto re-clocking at 143, 177, 270, 360, 540 Mbps and 1.485 Gbps and Ethernet based remote control and setup.

For more information, contact Sony at 212-930-6357 or visit *www.sony.com*.

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Business News

Australian Consortium to Buy BBC Broadcast

LONDON & SYDNEY, AUSTRALIA

BBC has sold its BBC Broadcast digital media distribution service to Australian based business consortium Creative Broadcast Services for £166 million (US $304 million).

The deal will be complete by the end of summer, pending the approval of the Secretary of State for Culture, Media and Sport. Pam Masters, managing director of BBC Broadcast said now is the time for the business to flourish under new ownership.

"We feel confident the decision is right for our business and staff," she said. However, the trade union that represents most of the BBC Broadcast staff is reportedly opposed to the sale.

Sydney, Australia-based Creative Broadcast Services group is owned Macquarie Consortium, which includes the Macquarie Bank and one of its funds, Macquarie Capital Alliance Group (MCAG). An MCAG spokesperson said the group will delay expected layoffs for one year, according to several reports. In March, it was reported that the BBC would save $615 million a year by laying off nearly half of its professional services staff.

Accom Shuts Down

MENLO PARK, CALIF.

Despite launching new products at NAB, Accom—maker of broadcst recording equipment, storage devices and servers—closed its doors, effective June 16, 2005. In April, the company launched AirCleaner Delay System, used in live broadcasts to catch slips of the tongue and "wardrobe malfunctions."

In a notice on the company's Web site, Junaid Sheikh, Chairman and CEO of Accom said the company will continue to provide technical support for customers. "I would like to thank all our customers, resellers and employees for their unwavering support and commitment over the years. We intend to continue to provide technical support to our customers for as long as the support revenues justify it."

Snell & Wilcox Drops Out of IBC2005

HAMPSHIRE, U.K.

Snell & Wilcox decided to skip IBC2005 and redirect its marketing dollars on regional tradeshows and roadshows.

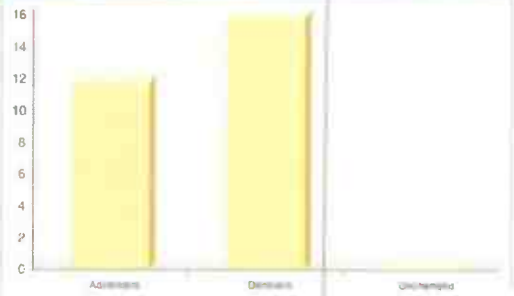
The company announced its decision in a letter from Joe Zaller, vice president of strategic marketing. Zaller emphasized that the move only affects the tradeshow—to be held in Amsterdam, Sept. 9-13—this year and that it doesn't mean that the company is cutting back its marketing budget.

"We're not looking to spend less, but to spend smarter," Zaller said in his letter. "We plan to use the $1 million that we will save by not exhibiting at IBC to enhance our marketing activities in a variety of ways."

Snell & Wilcox will emphasize its presence at approximately 15 smaller tradeshows throughout Europe and Asia and South Africa and plans to launch a product and technology roadshow to destinations yet unannounced.

Zaller added that the decision to opt out of IBC should "not be interpreted as a wholesale rejection of major tradeshows," and that the company is still committed to exhibit at NAB in Las Vegas. He was also non-committal on whether the company will return to IBC in 2006.

WIN-LOSE RATIO



TOP ADVANCERS BROADCAST STOCKS
(June 17 - July 1)

Gray +7.63%
Sinclair +4.05%

TOP DECLINERS BROADCAST STOCKS
(June 17 - July 1)

Young -19.51%
Paxson -5.97 %

TOP ADVANCERS TV STOCKS
(June 17 - July 1)

LSI Logic +10.00%
Leitch +8.28%

TOP DECLINERS TV STOCKS
(June 17 - July 1)

Harmonic -16.89%
Avid -6.33%

To have your company listed, contact Deborah McAdams at dmcadams@imaspub.com.

TV Tech STOCKS as of July 1

Company Name	52-Week Range	June 17	July 1	% Change
Avid	40.90 - 68.35	58.77	55.05	-6.33%
Belden	17.65 - 24.59	21	21.01	0.05%
Ciprico	3.15 - 4.90	4.13	4.27	3.39%
Harmonic	4.25 - 12.40	5.92	4.92	-16.89%
Harris	21.60 - 35	32.44	31.71	-2.25%
Leitch	6.72 - 11.38	10.27	11.12	8.28%
LSI Logic	4.01 - 8.75	7.9	8.69	10.00%
Pinnacle	3.25 - 6.68	5.96	5.68	-4.70%
Sci. Atlanta	24.61 - 35.59	33.8	33.51	-0.86%
SeaChange	6.84 - 19.75	7.02	7	-0.28%
Tektronix	20.97 - 34.39	24.55	23.32	-5.01%

Broadcast STOCKS as of July 1

Company Name	52-Week Range	June 17	July 1	% Change
Acme	3.30 - 7.45	4.07	4.08	0.25%
Belo	18.00 - 26.73	24.48	24.12	-1.47%
Emmis	15.29 - 21.39	17.75	17.83	0.45%
Entravision	6.85 - 9.11	7.75	7.85	1.29%
Fisher	45.02 - 52.60	49.23	47.1	-4.33%
Gray	10.58 - 15.74	11.4	12.27	7.63%
Hearst Argyle	22.57 - 26.48	24.75	24.56	-0.77%
Nexstar	4.52 - 11.09	5.91	5.93	0.34%
Lin TV	13.68 - 21.00	14.49	13.85	-4.42%
Paxson	0.48 - 3.30	0.67	0.63	-5.97%
Sinclair	6.12 - 10.45	8.88	9.24	4.05%
Liberty	34.32 - 46.91	36.51	37	1.34%
Univision	25.00 - 35.22	26.85	27.7	3.17%
Young	4.06 - 13.00	5.28	4.25	-19.51%
Tribune	35.02 - 45.04	36.01	35.18	-2.30%
Meredith	44.51 - 55.47	48.93	48.44	-1.00%
EW Scripps	44.73 - 53.31	49.49	48.62	-1.76%

World Radio History

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