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D-A Converters Demonstrated

DTV legislation takes back seat as Capitol Hill deals with Katrina

by Deborah D. McAdams

WASHINGTON

Democrats wouldn't come to the DTV deadline table without some sort of subsidy program for digital-to-analog converter boxes. Such was the conventional wisdom on Capitol Hill at press time, when lawmakers were in the midst of examining the vast bureaucratic miasma that was the federal government's response to Hurricane Katrina.

While Democrats in the Senate Commerce Committee were still waiting to see a draft DTV bill from the majority, members of the House Commerce Committee were inching toward a compromise on converter-box subsidies.

House Commerce Committee Chairman Joe Barton (R-Texas) previously opposed a subsidy program, but sources on Capitol Hill said he "agreed to some form" of it in order to get Democrats to support Dec. 31, 2008 hard-date legislation.

LEGISLATION, PAGE 28

GVG Goes Tapeless

Infinity unveiled at IBC

by Tom Butts

AMSTERDAM, THE NETHERLANDS

After holding out for two-plus years while Sony and Panasonic battled it out on the tapeless acquisition front, Grass Valley finally unveiled its IT-based tapeless product line, the Infinity, at IBC2005.

In front of a packed audience including the press and customers, Grass Valley officials touted Infinity's "truly

INFINITY, PAGE 18

Sun Sets on C-band

'BigUglyDish' disappears from backyards

by John Merli

WASHINGTON

It reached its peak less than 25 years ago, but it seems more like light years since the era of huge backyard C-band satellite dishes captured hundreds of channels of free television for several million people in a span of only a few years that today is the stuff of communications folklore.

Those big fat dishes were hard to miss. Behemoth C-band disks measuring up to three meters wide, rising out of rural backyards (and often hidden in ingenuous places in the big city), pointed toward clusters of distant satellite signals in space.

Today, their numbers are dwindling rapidly in the digital age, yet it's not uncommon to spot the perhaps 200,000 C-band receivers that remain—the mostly weather-worn TVRO1 and TVRO2 dishes (TV

C-BAND, PAGE 12

Display four HD signals, any way you like

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Podcasting arrived out of nowhere, knocking the wind out of the "expert" prognosticators. While the established media outlets scrambled to make sense of it, a few talented small-scale producers sneaked under the radar, finding new global audiences... p. 30

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Media Server Technology

The reliability of media server systems and their storage networks continues to be a growing factor in determining which systems are employed and how. As the systemization of these components becomes more integrated into operational workflow... p. 34

Doug Lung

RF Technology

Earlier this summer, an interesting debate developed around the FCC Notice of Inquiry on "Technical Stancards for Satellite-Delivered Network Signals" over how to determine whether a household can receive a local network affiliate's DTV signal over-the-air... p. 36

FROM THE EDITOR

Partners, Not Enemies

The public safety communications problems in the aftermath of Hurricane Katrina have exposed weaknesses that could negatively affect the DTV transition timeline. However, despite some legislators' opinions, broadcasters should be seen as partners and not foes in resolving these communications problems.

The issue of broadcast spectrum being used to improve communications capabilities for first responders has been a hot topic in Washington for the past several months, (advocates for emergency communications professionals even ran ads on D.C.-area radio stations for several weeks last summer, pushing for an early end to the DTV transition).

The arguments for ending the transition earlier rather than later in order to free up spectrum for first responders fits in well with the populist tendencies of Sen. John McCain, who has picked up this political football and run with it. Who could argue against giving emergency officials the vital tools they need to do their jobs effectively?

Unfortunately on the floor of the Senate last month, the Senator continued his wrath against broadcasters, accusing them of "blocking access to spectrum for first responders who serve over 50 percent of the country." In addition, he proposed moving the hard date of the analog shutoff from Jan. 1, 2009, which was agreed upon in principle by lawmakers last summer (and NAB) to the original shutoff date of Jan. 1, 2007.

It's easy to simplify things and make broadcasters the scapegoat. A solution to this problem requires cooperation among all parties. Rather than condemn broadcasters, the Senator should be praising them. Broadcasters are just as important when it comes to communications during times of crises. It's their mandate and they've done an extraordinary job providing vital information to Hurricane victims.

* * * *

With this issue, we welcome James O'Neal as our new Technology Editor here at **TV Technology**. James is a former broadcast engineer with VOA (Voice of America) Television in Washington D.C. Along with his 35-plus years of experience in broadcast, James also brings with him a love of broadcast technology history. Next time you see him at NAB, ask him about one of his latest projects: building a camera around an Indian Head Monoscope tube!

Tom Butts
Editor
tbutts@imaspub.com

LETTERS

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

HDV: Pro and Con

Dear Walter Schoenknecht:

Regarding your article in the Sept. 7 issue of **TV Technology** ("Who Needs HDV?").

As a producer at a big corporate department, I probably have as good a view of the state of the video shooting and editing business for corporate use as anyone else. And, I have to say that I second your opinions about HDV.

I rented a Sony HDV camera for a long day of B-roll shooting. I shot both HDV and DVCam resolutions, in both 60i and Cineframe "24p." Then I brought the footage back and input all of it to Premiere Pro 1.5.1. The DVCam footage went straight into a standard widescreen timeline, and the HDV stuff went smoothly into a HDV timeline. So far, so good.

Then, just for fun, I captured some 24p footage shot lovingly by a colleague with a Panasonic AVX100A.

My overall impression of the experience? The workflow issues associated with the HDV footage might just be too much trouble for a high volume, high throughput shop like ours; a shop, coincidentally, which will be SD and essentially 4:3 for some time to come. (I say essentially 4:3 because our satellite broadcast network will remain 4:3 until the day we shut it down in favor of our rapidly improving streaming distribution.) We routinely shoot 16:9 in Digital Betacam and broadcast and encode for our CD and DVD-based marketing materials in letterbox format.

Capturing to Premiere was simple. The editing was too. However, renders to MPEG-2 for DVD distribution or to WM for streaming were painfully slow. And, there's no great way to get the footage into our Avid Adrenaline and Sony linear digital editing suites without going through something like a Miranda box—another significant investment. While the Sony camera had a great range of setups and adjustability, the pictures compared unfavorably with the Panasonic 24p footage. And, the Cineframe "24p" imaging had way too many motion artifacts for my taste.

In the end, the Panasonic footage really looked pretty, and the HDV stuff looked clear... but edgy and jittery and obviously manipulated in unpleasant ways.

For the cost and workflow differences, I'll take the SD Panasonic footage for the time being—and I suspect the Panasonic AVX200A camera, capturing at DVCPRO100 HD rates (when it arrives) may make all the HDV cameras an afterthought.

A fun topic to discuss. Thanks for your article.

John Greenstine
Unisys Corp.
Media, Pa.

Dear Editor:

To answer Walter Schoenknecht's question "Who Needs HDV?" in the Sept. 7 issue of **TV Technology**; We do!!

We are an adventure documentary production company in Boulder and since we purchased our Z1Us last fall, we have had a bunch of shoots and all of our clients wanted HDV.

While on the industrial side we still mostly work with PD-150s (this is soon to change, once the Blu-Ray/HD-DVD war commences next year), we have been pleasantly surprised about the growing need for HDV stuff.

Now that the A1U is coming out in the fall, that will be the ultimate complement to our packages, even smaller than the Z1Us with a great picture from the CMOS (so we've heard) and XLR inputs as well.

These cameras also come at the best time for us as our two PD-150s were starting to kick the bucket.

In the broadcasting world, these cameras are really starting to pick up; industrially, we'll have to wait a year or so for the gradual upswing to start.

David D'Angelo
Serac Adventure Films
Boulder, Co.

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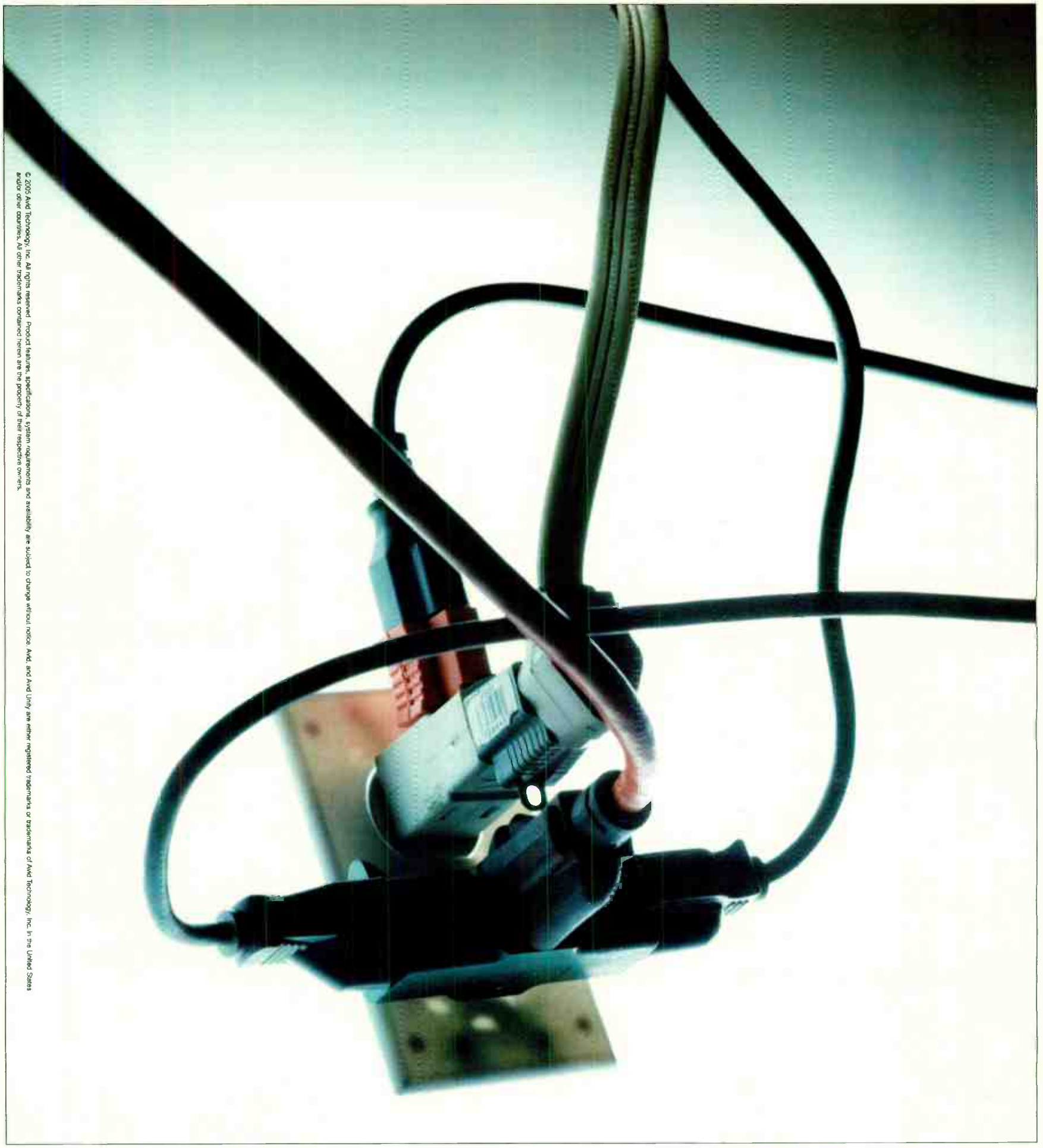

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Avid

ATSC Publishes ACAP Standard for iTV

WASHINGTON

The Advanced Television Systems Committee—which develops voluntary standards for digital television—has approved ACAP, the Advance Common Application Platform standard for interactive TV. The standard allows for the creation of more detailed and advanced interactive services.

"ACAP harmonizes the ATSC DTV Application Software Environment Standard with CableLabs' OCAP Specifications. This is important for content creators and consumer electronics manufacturers because a ubiquitous standard is necessary for consumer acceptance of enhanced and interactive services," said Mark Richer, president of the ATSC.

More information about the ACAP standard and the previously published Standard A/96 can be found on the ATSC Web site at *www.atsc.org/standards.html*.

iTV

'New' Newseum Goes HD

WASHINGTON

Building construction work is well underway at the Pennsylvania Avenue site of the Freedom Forum's Newseum.

Touted as the world's first interactive museum of news, the original Newseum facility first opened its doors to the public in 1997 and was located in Arlington, Va. It featured a large television production facility with state of the art equipment. That facility was closed in 2002 after the decision was made to relocate to downtown Washington, D.C.

Video will continue to play a large role in the next iteration of the Newseum. A 90-foot-long video display situated in the facility's Global Video Wall Theatre will allow visitors to view both breaking news events, as well as historic television news footage. Two HD television studios are also in the works. The first will encompass some 2,900 square feet of floor space and is designed to accommodate an audience of 125 people. A smaller news studio is also being constructed. Designed in an "L" shape, it will be located on the second floor and will project from the building's front wall to provide an unimpeded view of the U.S. Capitol Building.

According to Bud O'Connor, Director of Engineering for the Freedom Forum, the new facility is scheduled to open in 2007.

History

IO2 Heliodisplay Hits the Market

SAN FRANCISCO

IO2 Technology has launched its Heliodisplay projector, which projects video into thin air. The technology displays any video source in full high-resolution color in free space without the need for a screen.

Viewers can walk around the floating images that project from 22 to 42 inches (diagonal), and are available with interactive features.

Very much like science fiction, instead of using a mouse or remote control, viewers can move the picture with their finger to move the cursor.

The Heliodisplay is said to have many uses—in advertising, tradeshow displays, consumer-market applications such as videogames and movies—pretty much anything that uses a video display.

Chad Dyner, CEO of IO2 said the consumer and commercial applications for Heliodisplay are endless and suggests that the design and projection could offer new possibilities in the realms of advertising, marketing and defense applications.

Display

Hurricane Katrina Update

NEW ORLEANS

In the aftermath of Hurricane Katrina, broadcasters continue to provide valuable assistance to storm victims as well as attempt to repair and get their stations back on the air:

- The Corporation for Public Broadcasting (CPB) has offered another $500,000 in assistance to public TV and radio stations in the affected areas. The additional funds bring the total of CPB's emergency assistance to stations in Louisiana, Mississippi and Alabama to more than $1 million. The money has helped stations obtain fuel for generators, repair or replace equipment, and provide expanded news coverage and distribute DVDs and books to children in Mississippi shelters. The CPB is reportedly requesting a total of $90 million from Congress to rehabilitate stations damaged by the storm, defray operating costs in 2006 and provide specialized programming for hurricane victims.
- The Broadcasters' Foundation has provided assistance to TV and radio broadcasters in dire financial need. Chairman Joseph Field, Emmis Communications Chairman Jeff Smulyan and Clear Channel Television President William Moll coordinated financial aid to broadcasters through an emergency grant program.
- The Mississippi Association of Broadcasters has raised $25,000 to rebuild radio and TV stations and help personnel displaced by the storm. The Mississippi Broadcasters Hurricane Katrina Relief Fund will aid those most severely affected by the disaster.

Signasys is offering free help to stations needing equipment, parts and service and Harris Corp. has made arrangements to provide premade shelters with transmitters and all equipment pre-wired and ship to the customer's site.

Helinet Aviation Services says it has provided most of the aerial coverage of the areas affected by the hurricane. Helinet received clearance from the Federal Aviation Administration (FAA) to fly in the affected airspace. Major networks worked with Helinet to obtain and use aerial footage of the disaster areas.

Media conduct interviews at the Reliant complex in Houston following Hurricane Katrina. FEMA photo/Andrea Booher

As the disaster unfolded minute by minute, streaming video viewers broke usage records on most major news Web sites—reportedly surpassing online viewership during Sept. 11 three-fold.

Recovery

Call for Brinkman Scholarship Apps

HOLLYWOOD

The Hollywood Post Alliance (HPA) is accepting applications for the 2005 awards of the J. Michael Brinkman Scholarship & Mentoring Fund through Oct. 18.

J. Michael Brinkman

The program, named after Panasonic executive and HPA founding member J. Michael Brinkman, who died in 2003, promotes scholarship in the art and science of post production, providing financial scholarships, internships, mentoring opportunities, tours, access to technology and HPA educational events.

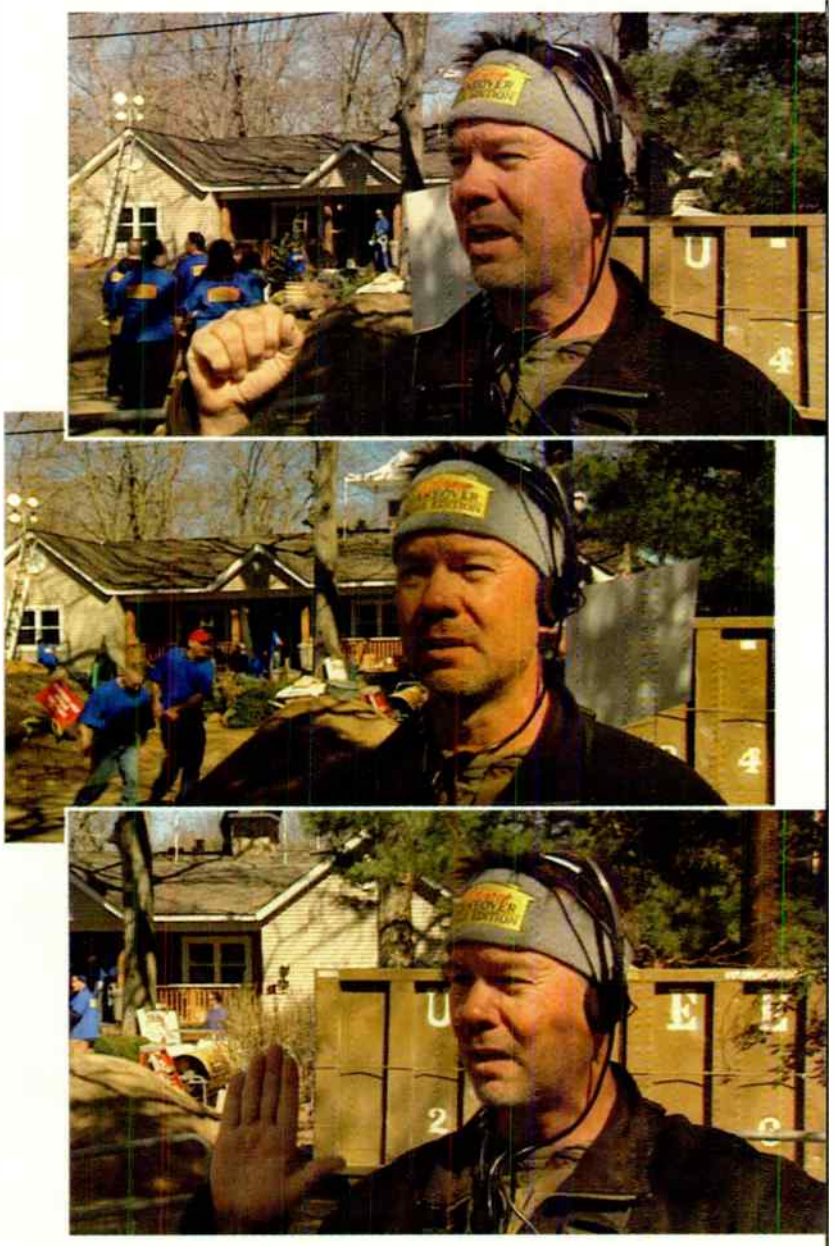
The award is open to any Southern California resident who is either an undergraduate student or working in post or the entertainment industry. The awards include a scholarship of up to $1,000, Avid and Sony editing gear and registrations to HPA events. The HPA Education Committee administers the fund.

Winners will be announced Nov. 17, 2005. For more information, visit *www.hpaonline.com*.

Awards

SONY

THE NEW WAY TO PRODUCE.



File-based production: the new reality in reality TV.

The new way to produce is substantially faster and easier, according to Patrick Higgins, director of *Extreme Makeover: Home Edition*. "In nine days we shoot 350 hours to bring a 42-minute show together. So I'm a big proponent of anything like the XDCAM™ system that's going to make our jobs a lot easier."

"I love scrolling through the camcorder thumbnails to see a shot really quickly, then going from playback to recording instantly. Then there's no worry about backing up a tape or recording over footage. It's an amazing, practical advantage. The camera is also phenomenally fast. I'm seeing light levels that I can't see with my naked eye."

"We shoot in the rain; we shoot in the snow, below 30 degrees or 115 degrees. Also, when you're building a house there's all sorts of dust, dirt. We cannot wait for the environment to work with us. We have to work within whatever environment we're in. We've had zero problems with our XDCAM camcorders."

"I would say to anyone who was thinking about using this camera, they're going to have an incredibly positive experience."

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Patrick Higgins,
Director of *Extreme Makeover: Home Edition*

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HD Nature Channels to Launch

Discovery, National Geographic to debut high-def initiatives

by Susan Ashworth

WASHINGTON

Television viewers are certain to cheer when they realize that nature—its dewy Everglades, African savannas and Emperor penguins perched on Antarctic ice—are about to come to life in high-definition in a whole new way.

Two new high-definition initiatives are set to launch in 2006, a direct result of the growing desire on the part of consumers to see nature in high-definition on the little screen.

Early next year, Discovery Communications will kick off a new series of programs called "Atlas." Around the same time, National Geographic Channel will launch its new HD channel, NGC HD. Competing for viewership, both iniatives promise viewers a front-row seat unlike any other.

CONSUMER DEMAND

When television viewers talk, sometimes networks listen. In April, Beta Research Corp. released its 2005 Brand Identity Survey, asking viewers what type of high-definition programming they'd pay to see. The No.1 answer was nature. Viewers in the survey ranked National Geographic as the primary channel they would most hope to see in HD, followed by Discovery Channel.

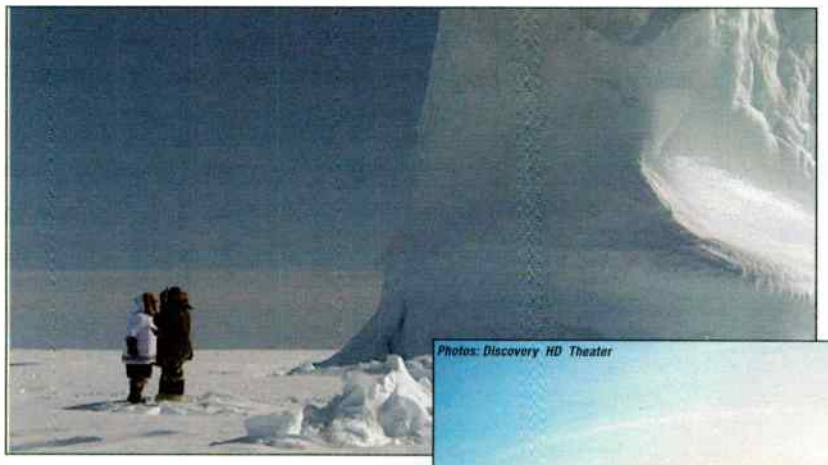
Both networks have dabbled in high-definition programming. But the introduction of these two HD initiatives will offer extended, dedicated HD images in a way that have not previously been available to the average consumer.

Discovery Channel made a commitment to HD in 2002 when it launched Discovery HD Theater, its hi-def programming channel. Now, the network is aiming to do itself one better with Atlas, a slate of 30 programs shot entirely in high definition that will take viewers to some of the most compelling and visually arresting spots in the world.

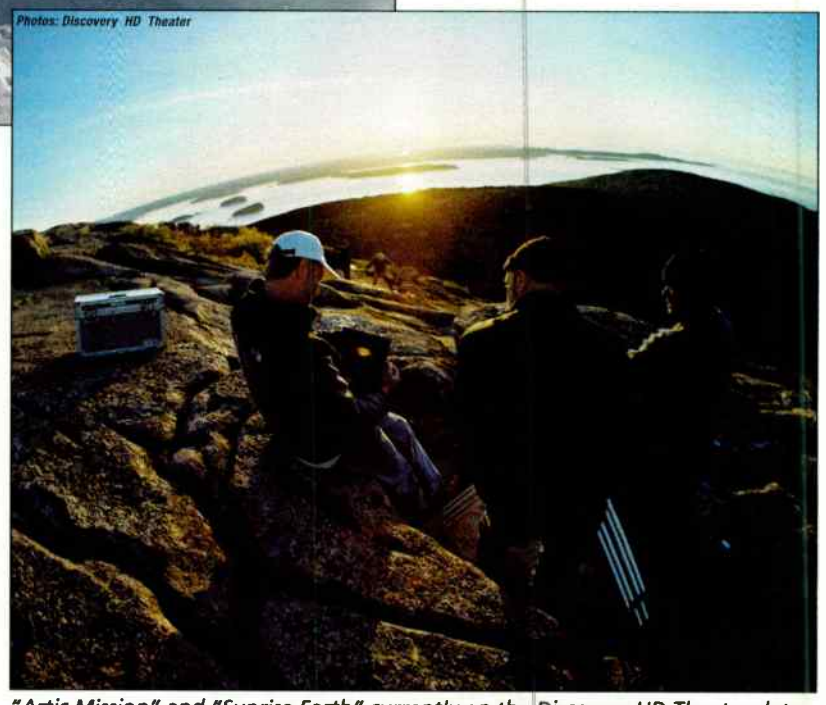
The five-year, $65 million project will involve travelling to 30 countries and geographic regions. As part of Discovery Communications' ongoing goal of boosting its original high-definition production, four new Atlas programs will be released each year starting in 2006. The initiative has been spearheaded by Discovery Communications founder John Hendricks.

"Spectacle, splendor, surprise and story are the hallmarks of the programs," said Barbara Cvrkel with Discovery HD Theater.

Rather than simply being a travelogue of destinations offering touristy to-do lists, the two-hour programs will serve as anthropological investigations into different regions and cultures around the globe.



Photos: Discovery HD Theater



"Artic Mission" and "Sunrise Earth" currently on the Discovery HD Theater slate, will be ramped up next year with the addition of the Atlas franchise.

"Each one is a magic carpet ride of stunning photography, cutting-edge effects and personal stories that put the viewer into the heart of the country and its people," she said.

The first installment of the series will focus on China, showcasing the Chinese landscape, its culture and politics.

"It highlights stories, including China's building boom through the eyes of one of its most successful developers, a young girl striving to be on the country's Olympic gymnastic team and a policewoman battling the drug trade," Cvrkel said.

The first program is currently in post-production and will air domestically and internationally on Discovery Channel and Discovery HD Theater.

The second installment in the Atlas series will explore Australia, with stories that look at the Australia team that tested scramjet rockets in the Outback, an Aboriginal dance troupe and a surf champion lifeguard.

Discovery is currently in production with programs on France, Italy and Brazil.

Discovery is primarily shooting the series in 1080i at 59.94 fps on Sony HDW-F900 HD cameras, with the China and Italy programs shot on Panasonic Varicam 720p HD cameras, with programming then upconverted to 1080i.

Aerials of the Australian outback have been captured via a gyro-stabilized HD helicopter mount from Gyrocam. For the Atlas coverage of France, a Tornado slo-mo HD camera from ARRI was used, which offered the network the capability of shooting up to 2,000 fps.

The Atlas program may also prove a unique testing ground for another HD adventure—advertising. While no requirements are in place, Discovery is encouraging that advertising be originated in HD.

NGC, FOX TEAM UP

With NGC HD, National Geographic Channel enters the HD fray as well. The network has teamed up with its partner, Fox Networks Group to create the new network, which is expected to roll out in early 2006 to celebrate National Geographic Channel's fifth anniversary.

"This is a natural progression for our brand and our network," said Laureen Ong, president of the National Geographic Channel. "National Geographic has always strived to establish a new standard for the world's most compelling imagery, whether emanating from the bottom of the sea, the most remote rainforest or within everyday life."

After launching in January 2001 with 10 million subscribers, National Geographic Channel has grown 450 percent to 55 million. The network is anticipating that NGC HD will also become popular with its core viewers—a belief backed by statistics from Beta Research and the network's cable and satellite partners who are looking to boost their own HD capability.

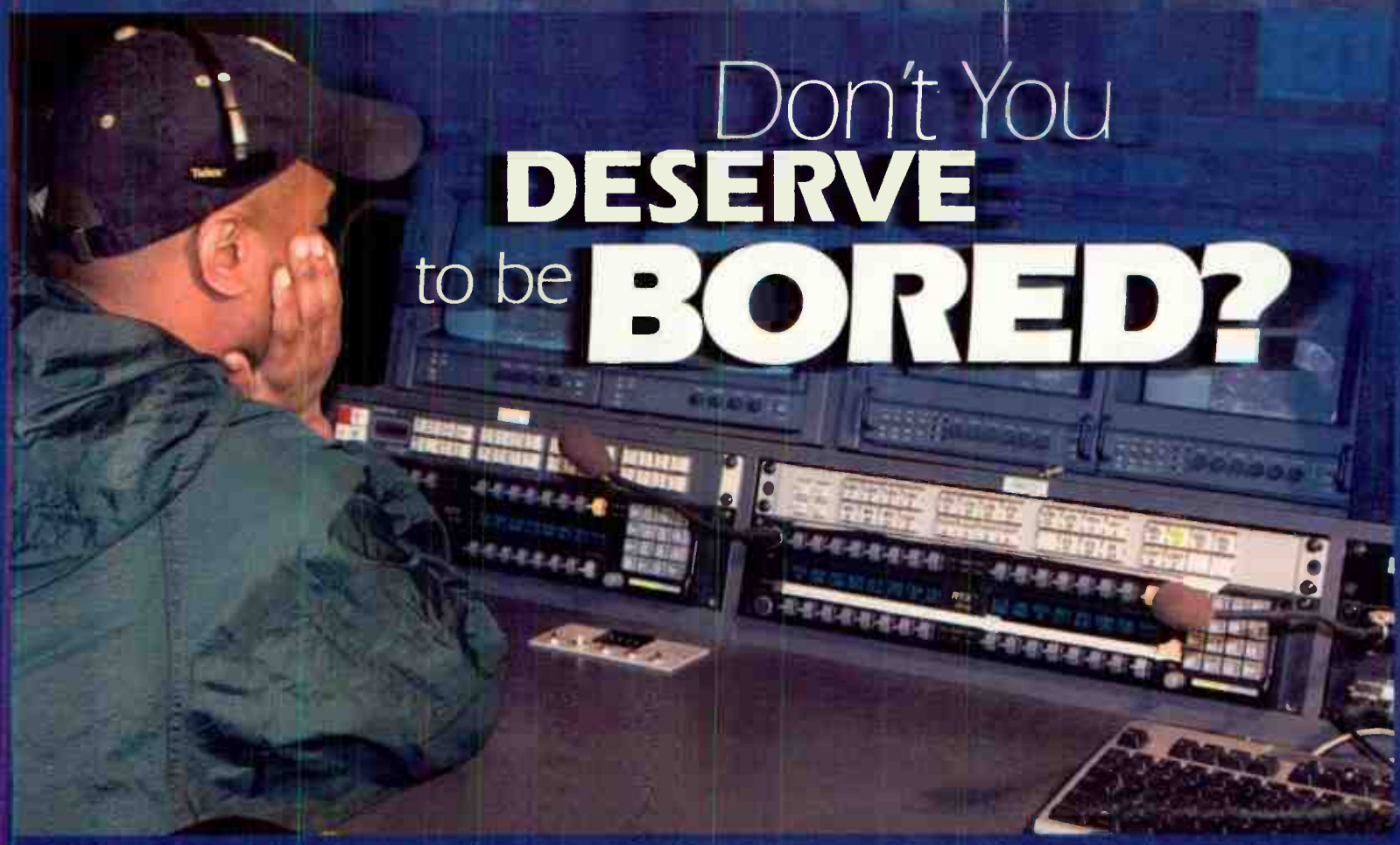
"National Geographic's rich tapestry of adventure, exploration, culture and science is something that begs for an HD application," said Tony Vinciquerra, president and CEO of Fox Networks Group.

To prepare for the new network, nearly all of National Geographic Channel's current program production is now being captured in HD. When the channel launches, approximately 90 percent of the programming will air in HD during primetime on NGC HD. The new channel will use five Panasonic Varicams, and plans are in place to install a variety of HD edit suite equipment and HD uplink gear.

The National Geographic Channel also has its eye on HD advertising. After seeing viewership grow over the last five quarters, the network was able to double its advertising volume compared to this time last year and expects to see some of its advertising air in high-definition on the new channel, said Nord Wennerstrom with National Geographic.

"This is a natural fit for National Geographic content," Wennerstrom said. "We've heard from distributors and consumers that they want NGC HD," he said.

Though not a nature-specific channel, Fox Networks is planning to branch out on its own with Fox HD next year, which will feature high-def programming from Fox channels such as the FX channel, the Speed Channel and Fox Sports Net. ■



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AES to Feature Major Sound Events

Surround sound will be hot at the 119th audio confab

by Mary C. Gruszka

NEW YORK

Audio comes alive at the 119th AES Convention, with a full lineup of technical papers, exhibitor seminars, tutorials, workshops, technical tours, master classes, special events and an equipment exhibition that will cover the broad range of audio engineering.

Included in the convention, Oct. 7-10 at the Javits Center in New York, will be strong broadcast and live-sound programs.

Roger Furness, AES executive director, said in keeping with the theme, "we have placed a special emphasis on touring sound, sound design for Broadway shows, and the science, art and technology driving live sound for performance and installation. That being said, we continue to expand our focus on broadcast events. Forums and panel discussions will explore the latest developments in surround sound for digital radio and audio for HDTV. We will also celebrate the 70th anniversary of FM radio with the recreation of a live radio drama."

Furness added that more than 20,000 attendees are anticipated, a 15 percent jump over last year.

Audio pioneer Rupert Neve will deliver the keynote address on opening day. Neve began his life in audio in Argentina, fixing radios to broadcast news of World War II. By 1964, he had developed high-performance transistor equipment that replaced traditional tube designs. The success of these units led to orders from recording studios for mixing consoles, with demand growing rapidly. During the 1970s, Neve introduced "Moving Fader Automation" or NECAM, considered the first moving fader system.

Over the last 20 years, Neve, operating as ARN Consultants, collaborated with a variety of audio console manufacturers in console design. Now based in Texas, Neve established Rupert Neve Designs in April 2005 and launched the Portico range of modular high-performance audio products.

"His name is synonymous with various pieces of audio equipment. Everyone has had contact with something Mr. Neve has been associated with. He's become legendary and is truly a unique voice," said Jim Anderson, AES convention chairman, and chair of the Clive Davis Dept. of Recorded Music at New York University's Tisch School of the Arts.

FORWARD-THINKING

Live sound, while always a part of AES, has never been more prominently featured than at this year's convention.

"We're responding to the changing business of audio," Anderson said. "The live sound and broadcasting events will help attendees to be forward-thinking in how they're looking at facilities as well as the tools and techniques that they use."

The Live Sound Symposium will be held on Thursday, Oct. 6, the day before the convention, and most of the topics will be pertinent to broadcasters. Presenters include TV Technology columnist Randy Hoffner from ABC, who will speak on multichannel sound for sports.

Other presenters will cover such topics as wireless mics and performers, wireless management in stressful environments like Broadway/Times Square for live and televised events, intercom for large-scale events like the Olympics and the Super Bowl, and PA for TV mixing for a live audience while satisfying production demands.

Surround sound will also be the hot topic for the broadcast events, chaired by systems consultant David Bialik.

"This year we will have the most broadcast events of any U.S. AES convention in a long time," Bialik said. "We will focus on new cutting edge technologies relevant to broadcasters and examine their implementation. Capping this extraordinary program will be the live performance of an audio drama produced on stage at the Javits Convention Center by Himan Brown, the 93-year-old doyen of live radio production. Himan is talking with some high-profile actors, and this production promises to be an unforgettable experience."

Audio for HDTV, on Saturday morning, Oct. 8, will be chaired by PBS Director of Engineering Andy Butler, and is scheduled to include panelists Tim Carroll from Linear Acoustic, Rocky Graham of Dolby Labs, Geir R. Skaaden from Neural Audio, Alan Kraemer of SRS Labs and Dave Wilson, CE.

"Digital broadcast [formats] such as HDTV and the growing installed base of consumer home surround systems is creating the expectation that television programming should be simulcast in surround sound and stereo," Skaaden said. "Surround audio production and distribution is a trade reserved for the most experienced audio professionals, and the AES is the premier professional forum for audio engineers."

Monday, Oct. 10 will be jam-packed with other broadcast related events: Designing a Broadcast Facility for 5.1; Mixing a Live Broadcast in Surround; Designing a Facility for HDTV: The Audio Considerations; and Perceptual Loudness. While the first two are planned to be more radio-centric, Bialik said that much of the information would be applicable to TV as well.

Audio pioneer Rupert Neve will keynote the 119th AES in New York on Oct. 7.

NEW GEAR

Perhaps the most visible part of the AES convention will be the equipment exhibition, and response from vendors has been strong with more than 400 exhibitors confirmed, a 10 percent increase over last year.

"The AES in New York is one of the year's biggest and most important events for Calrec," said John Gluck, sales and marketing director for U.K.-based Calrec. "As Calrec only makes equipment for broadcast, the New York show is of paramount importance as we have historically seen a high turnout of broadcasters. We hope to speak to many of our customers at the show, as well as give people the opportunity for hands-on demonstrations of our new surround-sound features."

Gluck said Calrec will have a full digital range on display at the show, with the Alpha, Sigma and Zeta consoles all networked via the Hydra.

"Calrec will introduce surround sound channels at AES, part of the System Plus development across the range of consoles," Gluck said. "System Plus also boasts significant hardware upgrades which make their U.S. debut at the show."

For Neural Audio, "AES proves to be a very productive conference every year for us as it is one of the few opportunities to spend four days solely focused on audio with industry experts and our clients," said Mark Seigle, president and chief marketing officer for the Seattle-based company. "New York is an added bonus as it provides for a qualified audience and agenda with proven leaders in audio."

Convention chair Anderson noted that many people are only aware of the exhibit floor, and one of his goals has been to better integrate the technical sessions.

"We're introducing a range of topics and trying to bring in some new people who have not made presentations at AES before," Anderson said.

Some AES technical sessions and topics relevant to broadcasters include multichannel sound, stereo and multichannel loudness perception and metering, audio processor ICs for advanced TV, microphones in high wind and rain, and the art of studio maintenance.

Systems design topics include the use of ferrites in the prevention and suppression of RF interference to audio systems, an overview of audio system grounding and interfacing, acoustics for the audio production environment, and performance issues in digital audio.

Other applicable topics include A/V synchronization, next-generation audio communications, loudspeaker basics, distance and depth perception as related to spatial mixing, and audio ear training, the latter presented by TV Technology columnist David Moulton.

Complementing the exhibits and the technical sessions are facilities tours. "Technical tours have traditionally been one of the most popular AES convention draws, and we've coordinated visits to a number of the jewels in NYC's media community," Furness said.

These include the new Jazz At Lincoln Center Complex in the Time Warner Building, a behind-the-scenes look at the CBS Ed Sullivan Theater, home of "The Late Show With David Letterman," Trutone Mastering Studios, the Food Network, and legendary recording facilities Avatar Studios and Electric Lady Recording Studios.

The 119th AES Convention "will mix real-world practical advice, esoteric theories, live musical performances, networking, new product introductions, historical events, demos, film screenings and awards events," Furness said. ■

For more information and to register for AES, visit *www.aes.org*.

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Comcast Sports Network
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NBA TV
(NBA, WNBA, and original programming)

WGN Chicago
(Cubs, Sox, Bulls home games)

YES Network
(Yankees games)

C-band

CONTINUED FROM PAGE 1

receive-only)—especially while driving through the back roads of rural America.

Historically, the widespread emergence of the iconic backyard dish in the 1970s and early '80s represented some of the same resourcefulness and independence reminiscent of the 19th century Wild West, when a relative handful of tech-savvy consumer pioneers decided to stake their claim for capturing television signals from space, for free, whether the powers-that-be in Washington liked it or not.

For veteran broadcast engineer, consultant and industry historian Mark Schubin, involvement in commercial satellite projects began in 1973. For the past 30 years, he's also been media consultant for New York's Lincoln Center.

"Back when TV was typically transmitted by satellite only to 100-foot-diameter dishes, Westinghouse had 3-meter earth stations for the high-power NASA Applications Technology Satellite-6. I borrowed one from Westinghouse, and ATS-6 from NASA, for an exhibition I put together in January 1975 called 'The Performing Arts and the Future of Television.'

"The idea was to set up an earth station on Lincoln Center Plaza and pick up images of the Colorado Concert Ballet performing live in Denver. A regisseur [dance master] in New York would critique the dancers and his comments would be sent back to them. We set up the earth station and got nothing," Schubin said.

"We checked the pointing with NASA and still got nothing. The NASA person asked if I'd used a compass or an architect's benchmark. I said I'd used the compass. He did a quick calculation of magnetic deviation and then said, 'Give it a good swift kick to the left.' I did, and the pictures locked right in!"

The Communications Act of 1934 stipulated that no one could receive transmissions, other than broadcast or amateur, without the express permission of the senders. Anyone with an earth station who didn't have such permission was committing an illegal act. When a third program source, Trinity Broadcasting, went to satellite and gave blanket permission to all dish owners, the physical possession of an earth station suddenly was not automatically suspect.

C-band had been designated the first commercial (nonmilitary) frequency band set aside for general satellite use in the United States. But C-band was shared with terrestrial microwave services, so there were limits on how much power satellites could transmit so they wouldn't interfere with microwave towers.

"This satellite power issue had limited the degree to which smaller dishes could be used at C-band, as opposed to Ku-band, which is not shared with the terrestrial microwave service," according to satellite engineer Sidney Skjei of Skjei Telecom in Falls Church, Va. "This is one reason the typical backyard C-band dish is so much larger than the Ku-band dishes now used by DirecTV and EchoStar."

"We are grateful to the C-band customers who made it possible for the satellite industry to launch 20 years ago. But digital technology is clearly the wave of the future."
—Starz Entertainment statement announcing the end of C-band availability

WTCG in Atlanta, destined to become a national "Superstation," went up on satellite in 1976, and PBS began broadcasting over C-band two years later. And while NBC, ABC and CBS came to C-band in 1981-83, the birth of the C-band backyard dish movement began a few years earlier in October 1979. In response to hundreds of formal requests from the public that C-band dishes be allowed to operate without licenses, the FCC, in its collective wisdom, agreed.

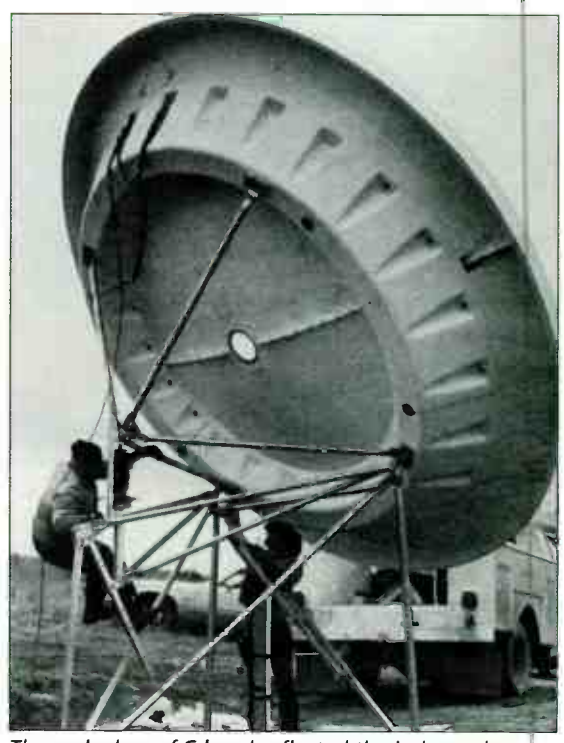
And then C-band really took off, according to Bob Cooper, the legendary C-band proponent who is given much of the credit for tapping the imagination of millions of America's would-be techno-pioneers. Cooper (widely known as "Coop" in C-band folklore) had taken full advantage of national media attention from such venues as the "CBS Evening News" and TV Guide (where he wrote firsthand about his own backyard dish).

Cooper was soon besieged with thousands of inquiries. As a way to get the word out, he began publishing C-band news, dish owners' comments, research and other aspects of the growing revolution. Proud C-band dish owners began lovingly referring to their dish as BUD (BigUglyDish).

"Prior to the FCC's approval, a complicated, time-consuming and expensive licensing procedure was required for a 'legal' dish," Cooper said. "Now we had the real possibility of privately owned, inexpensive C-band dishes. Already in '79 there were thousands of unlicensed terminals. But with licensing gone, it became a wide-open market allowing 'respectable' firms such as Channel Master, Panasonic, Uniden, Drake, and even Sony, to create hardware for C-band. By '85, you could set up a dish for as little as a thousand bucks."

TUNING IN THE WORLD

Cooper said the years 1979-86 were the best of times for C-band dish owners (although he knew time was running out). While the majority of typical terrestrial-only viewers could count the total number of channel choices on one hand, these newly legal C-band dish owners were now tuning into the world far beyond their local markets, and for free.



The early days of C-band reflected the independent attitudes of the Wild West.

Skjei said C-banders could tune into HBO, Showtime, and The Movie Channel, as well as WTCG, WOR and WGN.

"But there were also basic network feeds, too, along with PBS, and a PPV channel called 'People's Choice,'" Skjei said. (PBS still provides its Schedule X feed for C-band dish owners.)

"For a while, even most national cable channels were distributed in the clear—with no scrambling—fed directly to cable headends and to backyard C-band dish owners," Skjei said.

When some scrambling finally did begin, it led to some newsworthy mischief by that era's equivalent of today's computer hackers.

Several years before the FCC gave its blessing to C-band dish owners, Schubin remembers addressing the NCTA Executive Committee in Arizona: "I told them satellite signals were not secure and that the FM 'capture effect' could allow someone to knock a programmer off the air.

"Ralph Baruch of Viacom asked me if I was saying that HBO could knock Showtime off the air and said he'd take his chances with that, getting a big laugh. Sometime thereafter, the self-styled 'Captain Midnight' knocked HBO off the air doing exactly what I'd said."

Schubin said what had angered Captain Midnight was HBO's decision to scramble its signals, thus leaving C-band dish owners in the dark.

"The programming was FTA [free-to-air] only because an economical, dependable scrambling system had not yet evolved," Cooper said. "This FTA situation continued for seven great years, through early 1986, allowing aggressive sellers to roll out more than 3 million home terminals at numbers approaching 75,000 monthly.

"Yet it was a house of cards doomed to fail, and with each passing month prior to scrambling's launch, the cable industry became increasingly paranoid as they found themselves disconnecting thousands of homes each week from their cable lines because folks were buying their own home dish systems," said Cooper, who lives in New Zealand where he continues to publish his magazine, "SatFACTS Monthly."

While NBC uses the Ku-band to distribute its programming to affiliates, the remaining commercial networks still use C-band to transmit their programming to hundreds of affiliate analog dishes already in place. Economically, however, digital content is less expensive to transmit via satellite. A transponder typically accommodates one or two analog TV signals, while the same transponder could accommodate more than 10 digital signals.

The backyard C-band BUD owner lives on, but his days are numbered along with his program options. The latest example was this summer's announcement from Starz Entertainment Group, which said simply, "We are grateful to the C-band customers who made it possible for the satellite industry to launch 20 years ago. But digital technology is clearly the wave of the future."

On Dec. 31, Starz will end its analog transmissions to all its C-band consumers. ■

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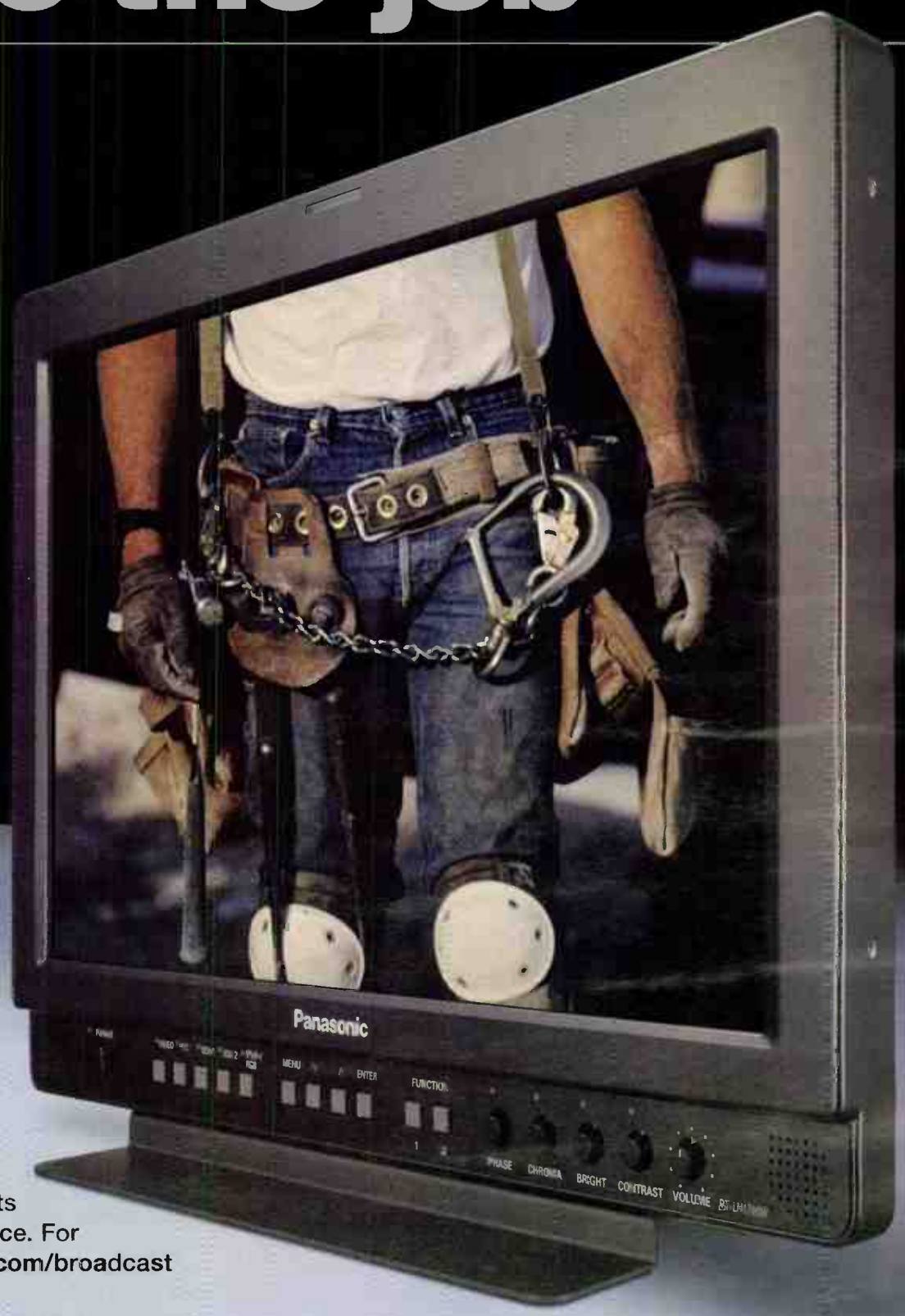

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Battling the War Against the Worms

Operators confront shifting menace to IT systems

by Sanjay Talwani

WASHINGTON

As if broadcasters, networks, and cable operators didn't have enough to worry about, a spate of summer computer worms made clear that a lack of diligence in network security can have results ranging from inconvenient to catastrophic.

The attacks by the worms—variants of Zotob, Bozori, Rbot and many more—failed to disrupt the on-air systems of CNN and ABC. But they infected, by most estimations, computers at hundreds of companies and institutions, and spoke to the need for media operations big and small to install their systems in an attack-resistant architecture and stay the course in protecting the network from the invaders.

HIGHER STAKES

As broadcasters move to more integrated, networked environments, the stakes get higher. Fortunately, most systems integrators have built the crucial on-air systems on independent networks with tightly controlled access to the outside world, and equipment vendors continue to work with customers to keep systems patched and running.

"The key to keeping the system as secure as possible is to eliminate or limit severely the amount of connections that you allow into your automation network," said Rick Stora, director of broadcast operations for Dallas-based automation company Sundance Digital. "The IT aspect of the installation has to be properly engineered, the automation network needs to be on its own subnet and on a competent router, [and] any connections to our systems have to tunnel through the router with permission."

Networks should connect to the outside world only through firewalls and virtual private networks (VPNs) and—this is supremely important—no one should ever check outside e-mail from a computer powering critical applications. Once systems are installed, administrators need to keep up the protection of the underlying machines with firewalls and install service packs and security patches as they become available.

But the patches can take a lot of time to install and can even require rebooting a computer to take effect—thus taking it off-line—although Microsoft and others are improving that situation, say several computer security experts. And the patches can affect the performance of some software, meaning that the software vendors have to "qualify" the patches, making sure the software can continue to run.

"There's this sort of battle between users and vendors, because vendors should be qualifying the patches as quickly as possible," said Harlan Neugeboren, a TV Technology columnist, news technology consultant and CEO of The Workflow and Technology Group. Neugenboren also noted the mutual interest of vendors and users to stay on top of the issue. "As updates and things happen, any potential patch needs to be addressed."

"There are applications and systems which tend to rely on older OS versions or which incorporate or certify patches slower than their operators/users might like," said Scott Teissler, chief information and technology officer for Turner Broadcasting System, which includes CNN. "This limits broadcasters' ability to implement comprehensive protective measures as rapidly as they would like."

Sundance tests the patches itself and reports back to its customers, even providing a link on its Web site to the Microsoft Security Upgrade Web page when circumstances warrant, as they did for the Zotob worm.

Avid, with thousands of installed editing systems, also qualifies virus protection software and all Microsoft security updates.

"We engage customers as early as possible in the sales process and actively seek the involvement of IT staff in network planning," said Jim Frantzreb, Avid senior product marketing manager for Broadcast and Workgroups. "Over time, we have developed a system of proven best practices for networking including the setup of firewalls, network segmentation guidelines, qualified virus-protection software, and staying current with software upgrades and security patches."

"We design those networks so they are not accessible outside of the corporate network firewall," said John Delay, Harris Broadcast's director of Strategies for Networking Businesses. "In most cases we'll actually design the automation and management control system as its own independent network that really never touches the outside world.

"As customers have been migrating to central broadcast environments where they're actually sharing media across an external network, this has become a key aspect of re-engineering security procedures and policies within the architecture for the H-Class platform," he said, referring to Harris newest content delivery system.

Once installed, Harris goes to "exhaustive lengths" to protect systems against hackers, fully testing patches in either Harris' Sunnyvale, Calif., or Denver labs before authorizing cus-

> **"We design those networks so they are not accessible outside of the corporate network firewall."**
>
> **—John Delay, Harris Broadcast**

tomers to install the patches.

"We're pretty vigorous about this because of the size of the installed base," Delay said. "Make a mistake and you'll take someone's operation down."

LO-TECH SOLUTIONS

IT experts also urge broadcasters to keep wireless systems super-secure with 128-bit encryption. Change passwords often.

There are other, lower-tech recommendations from the experts also, with outside e-mail cited as the biggest culprit. "Are you an individual who at work likes to go out just anywhere on the Web, and start surfing and looking around?" said Shane Coursen, senior technology consultant for Moscow-based anti-virus protection company Kaspersky Labs. "Well, if you are, you are taking the chance of infecting your system at work, and of course if your system at work gets infected, chances are that other systems at that workplace are going to become infected."

Los Angeles PBS affiliate KLCS learned a security lesson about a week before Zotob, when RBot breached its system.

Alan Popkin, director of TV engineering and technical operations at KLCS, thinks someone accessed e-mail where he or she shouldn't have, despite strict policy against doing so.

Popkin discovered some latency on some of the tapeless operations' 40 or so servers, worked backwards to find the problem, and took about 10 computers offline.

"We got lucky and caught it early," said Popkin, adding that the problem remained invisible to viewers. "If we hadn't caught it, it would have crippled the system."

It wasn't the video servers themselves that were affected as they operate on a Linux system, he said, but the virus can remain resident on them and infect the computers that control them. In the end, it took Popkin about two-and-a-half days to fix the problem.

HISTORIC WORM

Computer attacks first hit public consciousness in the early 1990s as hackers, many in their teens, wrote and released evil code as a sort of digital graffiti. By the late 1990s, many of the hackers had grown up and then got fired when the dot-coms busted, prompting a wave of malicious attacks, many from within companies.

Targeted attacks, with ideological or personal motivations, altered or shut down Web sites and caused similar destruction. In 1999, the Melissa virus used e-mails to multiply and spread and set the stage for a new generation of pests. In 2004, the Sasser worm found its way through unpatched Windows 2000 and Windows XP machines.

Malicious code today can take over computers, use them as nodes for shady activity or as "Zombies" for spam distribution, or introduce "key-loggers" to track a user's every keystroke and potentially steal sensitive information. Many of today's worms and viruses originate with those who have made careers on the Web's dark side—information theft and spam rings in China, Russia, the United States, Europe and elsewhere.

The Zotob saga began Aug. 9, when Microsoft announced a vulnerability and patch for Windows 2000 machines, of which there are countless units running in media businesses worldwide. On Aug. 23, Microsoft announced a similar vulnerability and patch for the newer Windows XP operating systems.

CNN initially judged its computer disaster important enough to break away from other programming and show live footage of office computers continually rebooting, and some say the high-profile reaction may have saved others from falling victim. An ABC spokesman said the problems there were patched within a few hours, and despite the use of electric typewriters to crank out copy, "World News Tonight" went on flawlessly. CNN said the worm affected about 1,000 computers—a small percentage of its total.

Zotob and its cousins may not have had the reach or overall impact on the Internet of some earlier worms. But it was historic, said Coursen, in that it got inside the walls of big networks and then wreaked havoc on those systems. Other worms slowed the entire Internet with significantly increased activity worldwide. Zotob had no such worldwide impact, but was a nightmare for its victims.

IT experts note that the cost of network security is rising in both time and money. "It's no longer a part-time job," said Dan Doggendorf, director of Enterprise Technology, Infrastructure and Security at Belo Corp. station group in Dallas. "And especially in the media business, security has historically been viewed as a luxury."

Within less than two weeks of the initial attacks, hackers in Morocco and Turkey were arrested. That was good news to network operators, but the speed of the worm, arising just days after Microsoft first announced the vulnerability, puts operators in a bind. System administrators can take all the precautions they like, "but all take a finite amount of time to deploy, and complex software mixes on some machines can inhibit deployment," said Teissler of Turner Broadcasting. "Regardless of this incident, so-called 'day zero' exploits remain possible and some businesses will need strategies to cope well with such events."

Said Popkin, of KLCS, "It's not going to be a simple, easy battle, because you have people out there who have nothing better to do than write viruses." ■

Expanding Expandos

High-def sports spur growth in trucks

by Claudia Kienzle

HAMILTON, N.J.

While demand for HD sports production trucks rolled along at a comfortable pace this summer, it spiked when the fall football season hit and broadcasters began carrying college football games in hi-def in addition to the high-def NFL games they were already producing.

ESPN, ABC, Fox and CBS have significantly increased the number of NFL and/or college football games they are producing in HD, among other sports events. Truck vendors such as NEP, NMT, NCP and Game Creek Video said the increase in business not only booked their inventory of HD trucks; it even exceeded the supply.

All four have rapidly expanded their HD truck fleets, and are planning to build new HD trucks or refurbish existing SD trucks to meet the increased demand. But with a price tag of $10 million for each new HD truck, and seasonal ups and downs, they'd like to be assured of long-term commitments to help offset the huge capital expense so they don't become financially over-extended.

In January, when NEP Broadcasting, LLC, acquired three HD mobile units from its competitor NMT (National Mobile TV), the deal included an exclusive agreement with ABC Sports to facilitate all of its Monday Night Football, college football, golf, and other sports broadcasts, as well as a contract with Fox to provide facilities for its NFL "B" and "C" game broadcasts.

For NEP, the contracts ensured revenue to support the three new HD trucks—NMT's HD4, HD7, and HD8.

Clockwise from above: The control room in the NMT HD-10; NCP's seven truck fleet is outfitted with Canon lenses; Game Creek's 53-foot Expando Patriot HD production truck

DRIVEN BY DEMAND

"With this acquisition, we strengthened our focus on our niche market—national network sports events—and we are expanding our business in an efficient way," said George Hoover, senior vice president of engineering for NEP in Pittsburgh. "We benefit by getting longer-term commitments that we can count on, and the networks get attractive volume pricing and a vendor that understands what they expect in terms of equipment and service.

"Our HD truck fleet is growing rapidly. We had one HD truck two years ago, and now we have 13, with the number going to 15 by this time next year," Hoover said. NEP also has provided HD trucks to ESPN for Sunday Night Football, the NCAA Women's Final Four, NBA Championship, and the Stanley Cup.

NEP has supplied trucks for the Super Bowl every year since 1992, as well as every Olympics since 1984, including the upcoming 2006 Winter Games in Torino, Italy. NEP's Supershooter 24 HD truck is actually two twin mobile units, each with a 138-monitor wall, Sony MVS 8000 switcher, and Abekas HD DVEous DVE in a 30-foot control room. The "A" unit houses the production control room, transmission area, and graphics; while the "B" unit houses the audio, video, main transmission, and record/playback room.

"As rights packages are renegotiated for golf, tennis, and other sports, we will see a continued migration to HDTV for their regularly scheduled events, not just for the finals and tournaments," said Hoover. "This too will spur demand for HD trucks."

By selling 20 percent of its truck fleet to NEP, NMT is better positioned financially to contend with transitioning from a primarily digital and analog truck fleet to one which is all-HD.

"The reason for selling the assets to NEP was to get funds to pay down debt so that we can grow," said John Kemps, vice president of engineering for NMT in Torrance, Calif. It "allowed NMT the financial flexibility to focus on our next generation of mobile units. Those consist of upgrades to first-generation HD trucks, conversion of SD trucks to HD, new builds, and our SBS [side-by-side] units, which are powerful stand-alone HD/SD trucks in a 30-foot footprint."

There are approximately 165 mobile units in the United States and Canada, and of this number, Kemps estimated that 48 of them are HD, including seven SBS-style units. "The pace of HD building is slowing down a lot from a year ago. It was about 30 trucks only 15 months ago," said Kemps. "But the amount of programming in HD is still growing..."

The sale of assets to NEP won't change the business focus at NMT.

"Our company will still pursue both national network and regional sports network business," Kemps

EXPANDOS, PAGE 26

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CBS Bets on Broadband Sports

Initiative represents network's 'cable bypass' model

by Robin Berger

LOS ANGELES

The re-launch of the CBS SportsLine online property as a 24/7 digital proposition was "the culmination of a dream" begun eight years ago, according to CBS Sports President Sean McManus. Specifically, it would symbolize the network's omnipresent inroad into millions of lives, and, presumably, the dollars that would imply.

"It opens the world of CBS Sports during the daytime, which is prime-time on the Internet," said McManus, alluding to the millions who sneak a peak at Web sites while on the job. "They generally have no access to broadcast or cable television."

But for the press gathered at the CBS briefing last month, the big question was this: Will the new pumped-up SportsLine compete with cable nets like ESPN?

"It is a cable bypass strategy," said Larry Kramer, president, CBS Digital Media. "And I think it's as effective for parts of the sports world as it is for news."

In July, CBS Digital Media and CBS News announced the expansion of the network's online news site into a 24/7 multiplatform network, again defining its strategy as "bypassing cable television." According to CBS, the new and improved product would better facilitate breaking news reports; offer broadband-quality video and original reporting, commentary and analysis; debut a blog called "Public Eye" to foster a "dialogue" between journalists and the public; and feature an on-page video player called The EyeBox.

The EyeBox would enable users to build their own newscast from CBS online Web content, news broadcasts and archives.

"I think, honestly, for what a number of people have gone to cable networks for—talkshows, color commentary—we can provide that when people want to watch it," Kramer said.

The one missing element—big event coverage—is taken care of by CBS' broadcast network, he said.

Asked about rights to the all-important sports highlights featured on, for example, ESPN, Kramer said access differs depending on the sport.

"For the NCAA basketball tournament and our regular season basketball package, we own all of those rights and can exploit them any way we want," he said. "NFL football, obviously, is the exact opposite. There are a lot of restrictions. However, SportsLine does have a deal where they're able to, on Sunday after midnight, do an NFL highlight show."

While capturing this prized audience, Kramer said CBS would also optimize resources through a pull strategy instead of being obliged to push product according to the dictates of a more expensive and restrictive cable TV platform.

"We're not trying to be a cable network here—we have the advantage of not being one," Kramer said. "We benefit from the fact that we don't have to fill a cable network 24 hours a day. We can devote all of our programming to a Web site that allows people to come and get it when they want it."

CBS also aims to raise the bar for spectator sports "to provide a lot of things that haven't been seen on any other Web site," Kramer said.

In addition to featuring a sports edition EyeBox, SportsLine now offers "Glogs"—game Weblogs that feature game coverage written by hot new talent. The feature serves as an alternative to watching a rebroadcast in terms of getting color commentary as well as box scores, Kramer said. The added benefit is that users can get it on their own terms.

"There's nothing that a linear broadcast can do to compete with a totally customized experience," Kramer said.

To provide this 24-hour color, CBS plans to expand its stringer net-

SPORTS, PAGE 27

The Eyebox is an on-page video player that lets users build their own playlist of free broadband video from CBS SportsLine.com and CBS Sports.

Infinity

CONTINUED FROM PAGE 1

open" approach to production.

Infinity will have "a tremendous impact on the industry," said Jeff Rosica, vice president of worldwide strategic marketing and business development for Grass Valley. "It's a new way of thinking, a new attitude. It's a revolutionary and truly open solution and one that avoids proprietary approaches and uses advanced technology. We're bringing an end to proprietary thinking and starting a new era of complete openness and maximum choice."

The recording media for the Infinity line is based on Iomega's REV-based storage media and Pro-grade CompactFlash memory, both items easily obtainable from local consumer electronics or office supply shops. Media can also be recorded on USB and FireWire external storage devices or to networks via Gigabit Ethernet. The product line includes the Infinity Digital Media Camcorder and the Infinity Digital Media Recorder, as well as a line of Pro-grade REV disks designed for Infinity.

Scott Murray, Director of Market Development for Grass Valley, related how the company came about choosing the REV media for its tapeless platform.

The Infinity camcorder and recorder will ship by NAB2006, according to GVG.

"Our goal was to find a media about the same price as Digibeta tape. When we began to look at [Iomega's] REV drive, we said 'this is too good to be true; what if we build a camcorder around it?'" Murray said.

"We started to develop some analysis on the robustness to make this a professional grade media, and one of the problems we encountered was the issue of shock mounting, so inside the camera, we have a pretty sophisticated dampening mechanism to reduce the shock issues in the spinning media. We also increased the buffer size—it has a 30 second buffer, so while you're recording, if you have any sort of major shock you can stop recording and then pick it up and begin recording again."

Murray also touts the flexibility of the Infinity design, emphasizing that Grass Valley hasn't tied its tapeless fortunes to that of Iomega.

"Whatever the latest and greatest IT technology comes out, we can quickly adopt it."

Infinity allows users to choose from an array of compression formats including DV, DVCAM, DVCPRO, and for both HD and SD, MPEG-2 compression is available with support for I-frame and long GOP. An additional choice of compression, JPEG2000, which is primarily seen as a d-cinema codec, is available, offering what Thomson, (whose Technicolor division helped develop) high-quality compression with better efficiency, no blocking artifacts at low bit rates, and the ability to encode a master file and then decode different resolutions as necessary.

The 2/3-inch, 3-CCD camcorder can record in 525i60, 625i50, 1080i50, 1080i60, 720p50 or 720p60. SD formats are selectable in either 4:3 or 16:9 aspect ratios. The media player is a compact field recorder that works like a tape machine but accepts removable media instead. It can be connected directly to a NLE workstation or to a file server for immediate enterprise-wide use. The 35 GB REV disks hold more than two hours of SD and up to 45 minutes of HD video. Pricing for the REVPro drive is less than $500. REVPro media in 10 packs are expected to be priced at less than $70 per disk. Current CompactFlash cards on the market today hold 8 GB and are available for less than $700. The camcorder can also record on both media simultaneously.

Scheduled to ship in early 2006, the Infinity camcorder is priced at less than $20,000 and the recorder is priced at under $10,000. ■

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NASA TV Goes Tapeless

Space agency invests in digital video

by Susan Ashworth

WASHINGTON

Trying to further expand its reach into homes and classrooms all over the world, NASA has invested in a new multichannel video system that will allow the agency to create five customized NASA TV channels to more quickly supply images and information to the nation—with the promise of HD on the horizon.

A new tapeless video distribution system replaces the outmoded single-channel system that was used to provide disparate information. One minute, a viewer would be watching NASA Administrator Michael Griffin give a speech, the next minute, a scientist would be expounding on how the latest meteor shower would cross into Earth's atmosphere. And all of this had to be scheduled and routed through a single facility, with individual offices unable to contribute their own late-breaking news with speed or regularity.

STRICT REQUIREMENTS

In the past, content from the NASA centers would be reviewed, edited and programmed at a master control site at the agency's headquarters in Washington, D.C., and then distributed from an uplink facility at the nearby Goddard Space Flight Center in Maryland.

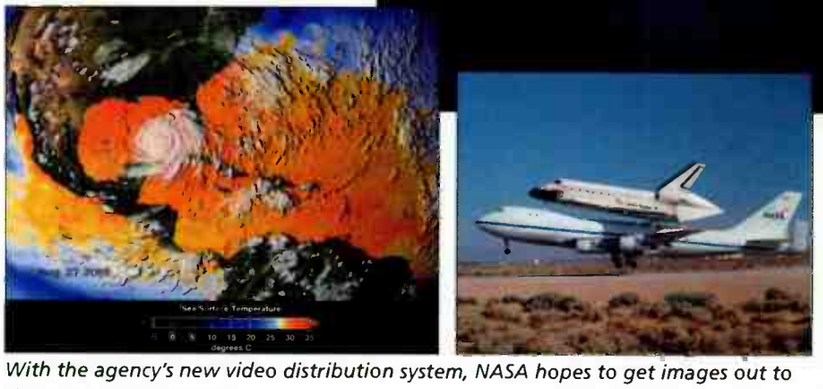
But that's all changed now. NASA ordered a digital store-and-forward system that had to be able to handle multiple live channels from multiple locations simultaneously; and it had to be able to put programming control in the hands of 10 individual centers, bypassing the traditional master control center. It had to have stringent security requirements for multiple live channels, plus it had to offer top-of-the-line video quality.

The resultant system is designed to improve both the contribution and distribution portions of the new NASA TV system, and get information out to the public more readily.

The system now offers five channels: a public channel (officially known as the NASA TV channel); a channel for educators; a space operations channel for NASA employees and contractors; and a media channel that provides images for the press to pick up and rebroadcast. The goal for the fifth channel has not yet been designated.

"We've got a lot of stories to tell. This technology gives NASA the ability to share content with the public more efficiently."

—Rodney Grubbs, NASA



With the agency's new video distribution system, NASA hopes to get images out to the media more quickly.

The new system now gives those 10 NASA centers the ability to feed video and files in real time though an IP network backbone to an uplink site. Video then airs on one of the five channels that comprise the system. For example, video of the last-minute and highly anticipated Discovery landing at Edwards Air Force Base in California in August was captured by on-site personnel and directly fed into the IP network to the uplink center in Maryland, all without waiting for scheduling permission from headquarters.

RICH EDUCATIONAL LEGACY

Ascent Media Systems & Technology supervised the implementation of the new NASA TV content delivery system, provided call center services for maintenance and warranty work, and supplied integrated receiver devices to NASA affiliates, which include broadcast and cable stations. Equipment within the new video chain includes Harmonic encoders, Wegener receivers and Wegener Compel control equipment.

"The desire to have a digital TV system came up several years ago," said Rodney Grubbs, NASA DTV program manager. The goal was to retire NASA's analog system, and give individual centers more control by creating a system that would allow the agency to switch origination from one center to another.

The agency also wanted to take better advantage of its rich educational programming. This system offers the agency the ability to push content in real time to different receive sites—kindergarten classrooms or museums—without having to squeeze programming into one continually monitored channel. In addition to point-to-point capability, the free-to-air media channel allows individual media organizations to pick up programming as they need it.

The system made its debut in advance of the highly publicized Return to Flight mission of the space shuttle Discovery earlier this summer.

The agency is still working through a few glitches. Live broadcasts offer their own tricky challenges, and NASA is working to solve a few live timing and syncing issues between audio and video.

But the system is allowing NASA to better meet one of its primary goals: provide near-immediate information to the press and the public that supports and funds this public agency.

"We've got a lot of stories to tell," Grubbs said. "This technology gives NASA the ability to share content with the public more efficiently and with better quality, while at the same time improving NASA's research and space flight programs ability to utilize video for science and engineering."

Though no high-definition images are currently airing on the new NASA TV channel, the system has an HD upgrade capability and Grubbs said the agency may begin high-definition programming within the next three years. The agency has equipped several of its centers with high-definition technology, including HD cameras at Kennedy Space Center in Florida, where Discovery launched, and a bevy of HD gear at the Dryden Flight Research Center at Edwards Air Force Base where experimental aircraft flights are being captured in high definition. ■

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Time Slips for New DVD Formats

Analyzing the future of packaged media

by Robin Berger

HOLLYWOOD

Interested parties throughout the entertainment, manufacturing and related service industries are trying to best position themselves to take advantage of next-generation formats. Among these are hotly debated formats pegged to high-definition resolution.

Addressing the issue of turf battles for future DVDs at the Entertainment Media Expo here in August was Jim Bottoms, president of Understanding and Solutions, a U.K.-based research and consulting firm specializing in media.

LEAVING THE STATION

Commenting to the EME conference, and afterward to TV Technology, Bottoms outlined the industry's prospects, and the best timetables for success. He also noted that "high-definition TV is taking off in North America with or without the emergence of new-generation DVD formats."

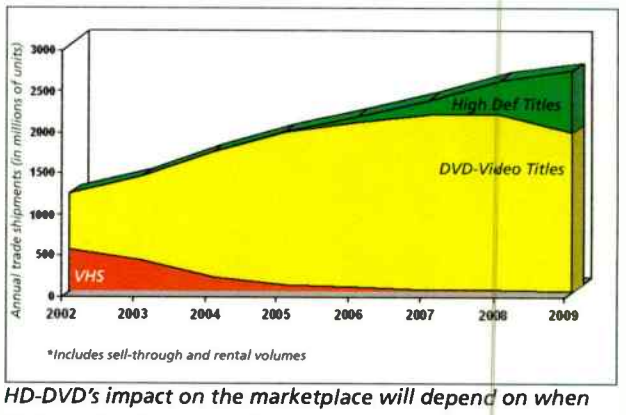
To set the scene he gave the following projections:

- By the end of 2005, 9 percent of U.S. homes will receive some HD programming, either via satellite, cable or over-the-air transmission. That will grow to nearly 40 percent by 2008 and 56 percent by 2009.
- By the end of 2005, 12 percent of U.S. homes will have HD display capability. That's projected to reach 56 percent by 2008 and more than 80 percent by 2009.

Bottoms' consulting firm came to these conclusions using input from the Consumer Electronics Association and various manufacturers, as well as consumer research and volume-price analyses, he said. He considers his firm's assessment of the prospects somewhere between the cynical and optimist extremes, depending on the adoption of a single next-generation format.

Cynics, he said, don't believe that the new formats add any appreciable benefits, noting that consumers are pretty happy with standard picture quality.

Optimists not only think there are demonstrable differences in picture, sound and navigation quality, they also believe the upgrade is apparent to consumers, thanks to promotion, hardware alternatives, and increased HD programming.



HD-DVD's impact on the marketplace will depend on when it's introduced and whether more than one format will be promoted. Chart source: Understanding and Solutions

Also noteworthy is a side benefit to the industry to keep the momentum growing: much stronger copy protection and digital rights management.

"They've got some very sophisticated copy protection systems which potentially will help the studios in their fight against piracy," Bottoms said. "And there's more space on the disk" for whatever extras they may want to include.

These optimists see "all the ducks lined up in a row," indicating "next-generation DVD can't possibly fail."

ONE FORMAT

Bottoms concedes that new-generation DVDs could bring a windfall to the industry, between the sale of new players (forecast at an entry level price of $300 by his calculations) and increased sale of DVDs.

"We believe that high definition can come along and grow the whole market because, typically, when somebody buys a new player, purchase per player rises in the short term," he said.

But Bottoms also reiterated this caveat: the optimist scenario "unfolds only if we have one format."

At this time the HD-DVD format favored by Toshiba, NEC, Warner, Universal and Paramount is still head to head against the Blu-ray format favored by Sony, Panasonic, Pioneer, Sony Pictures/MGM, Disney, Fox, plus a range of computer manufacturers.

"A few months ago, there were discussions going on to try and compromise," said Bottoms. "Everybody is telling us the time to compromise is too late—too late to go back and reformat the technology effectively, which is what they would have to do."

As Bottoms sees it, the industry must have a single format in place early enough in 2006 to gear up for the holiday season, the prime time for buying "electronic gizmos and video content."

If not, "the next major selling point then becomes Q4 2007," said Bottoms, "and then it's almost too late."

Adding to the anxiety of missing out on this techno wave is the advent of alternatives, namely video-on-demand services and electronic sell-through. The latter uses the Internet to sell the rights to burn your own disc.

According to Bottoms (and The New York Times), "a couple of the studios" are planning to launch this service at the end of this year or early next year.

"These services will gradually eat into the DVD business, but we don't see them as a major threat," he said—that is, unless the industry stalls too long in settling on one DVD format.

Carmel, Calif.-based Adams Media Research agreed with Bottoms' VOD assessment, noting in a July report that consumers spent only $344 million on VOD services in 2004 after three years of concerted efforts by the industry vs. $3.1 billion in video rentals and $1.1 billion in video sales.

But AMR also pointed out that traditional video rentals plunged by more than 20 percent in 2004 from their 2001 peak. And AMR is much more sanguine about the sell-through option.

On the other hand, Bottoms also compares the industry's crossroads on distribution to the "what-if" situation confronting Gwyneth Paltrow's protagonist in the movie "Sliding Doors."

"There's a great opportunity out there," Bottoms said. "But if you let the sliding doors close and miss the train, there's the potential that the whole package media business will start to go into decline."

He didn't say which format he believes will win out.

"It doesn't matter as long as it's only one," he said. ■

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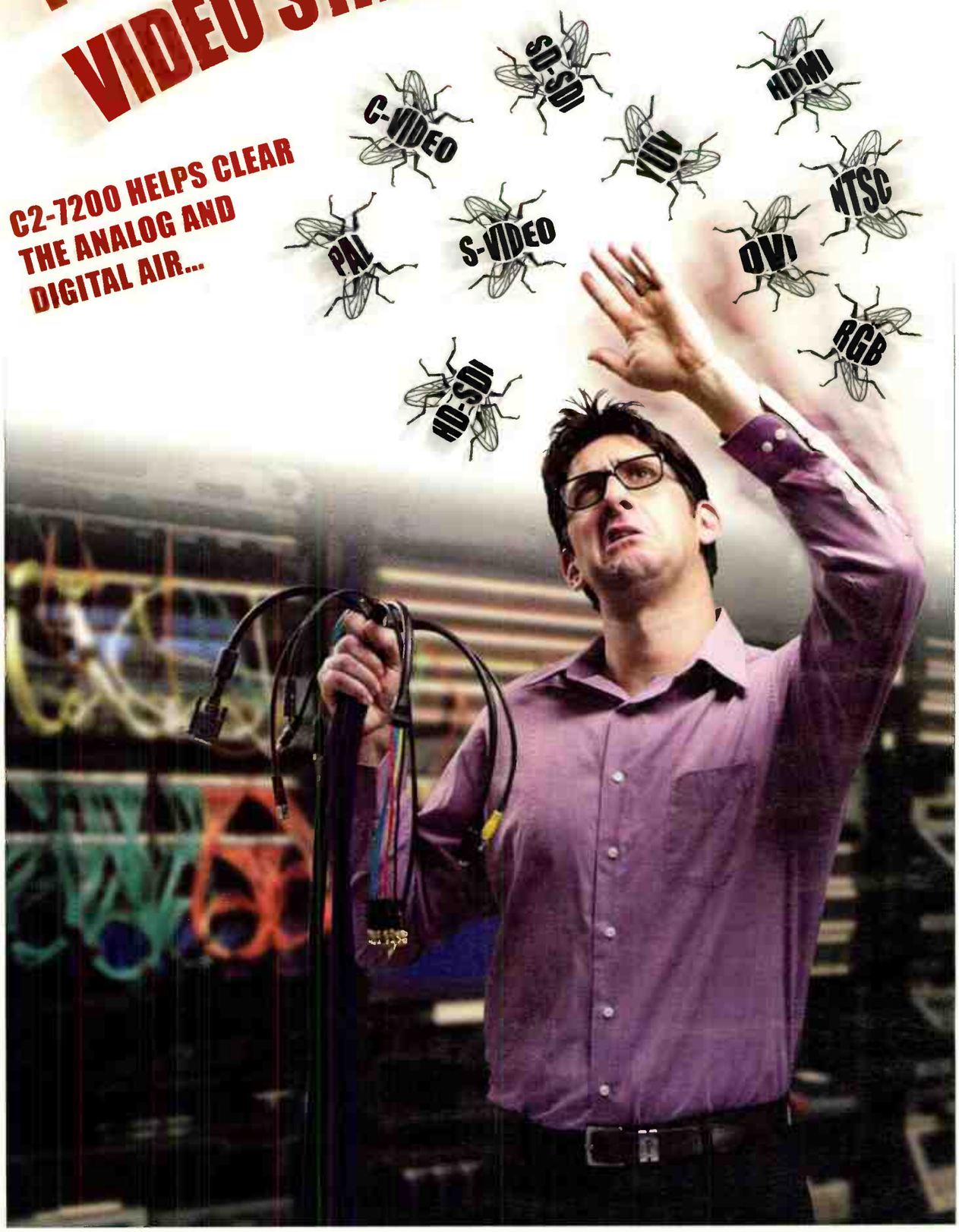

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Antenna Vendors Anticipate Another Wave

The time to plan for full power is nigh

by Deborah D. McAdams

WASHINGTON

Antenna makers and tall-steel teams are gearing up for a spike in business as TV stations prepare to crank up the power on digital transmitters.

"Another bottleneck is expected," said Jay Martin, vice president of sales and marketing for Dielectric, a manufacturer of towers, antennas and related peripherals in Raymond, Maine.

The first bottleneck occurred just prior to the first DTV broadcast deadlines in 1999. Manufacturers scrambled to meet the increased demand, because no one keeps 1,500-foot towers or two-ton antennas in inventory. Each one has to be made to spec, said Alex Perchevitch, president of Jampro Antennas in Sacramento, Calif.

"These are not companies that produce things like Dell computers," he said.

Then in late 2001, just six months before all commercial stations were supposed to replicate their analog coverage area in digital, the FCC changed the rules to allow stations to meet the deadline with low-power transmitters. Demand for high-power transmission equipment dwindled and manufacturers again raced to meet a new demand for low-power gear.

Now, stations broadcasting at low power will most likely need further structural modifications to meet the final full-power deadlines. The first of these deadlines hit July 1, when the top four stations in the top 100 markets had to transmit DTV at full throttle. (Stations that didn't change their DTV channel in the current channel-election process have to hit maximum power; those with a tentative DTV channel assignment have to replicate their 1997 analog coverage area.) All remaining stations have to maximize, or replicate at least 80 percent of their '97 coverage by July 1, 2006. And that leaves just about enough time to make it happen, according to Perchevitch.

"This is not a 30- to 60-day project," he said. "Somewhere between six to nine months is more realistic."

Both Martin and Perchevitch said most large-market stations have made the necessary modifications, but that those in smaller markets appear to be in wait-and-see mode. Just as with the on-air DTV deadlines, the FCC has allowed for six-month waivers on the full-power deadlines.

Martin said "The majority of people have things budgeted, but all of them are watching the commission's actions."

Based on records kept at Dielectric and those in the FCC's database, Martin has identified at least 400 stations that will likely have to replace existing DTV antennas with high-power units. Dielectric, one of the nation's largest makers of broadcast antennas, has the capacity to manufacture around 400 antennas a year, Martin said.

"We're sending out a notification to stations that we know will need to do improvements," he said.

SPECIAL DELIVERY

Antennas are custom crafted according to application, power level, gain, coverage pattern and so forth. Each is slotted for a specific frequency. A Channel 22 antenna does not work for Channel 24. The manufacturing cycle for a single broadcast TV antenna can vary from 30 days to as long as four months, depending on the type of unit. That timeframe doesn't take into account several mitigating factors—399 other simultaneous orders, for example. More imperative, however, is where that two-ton piece of steel is ultimately going to sit—i.e., the tower.

The next full-power deadline may not spur a huge rash of new tower construction, but existing structures will likely need modifications. And not everyone in the tower business is qualified to do the type of modifications necessary to tack a digital stick onto a tower, said Bill Harland, director of marketing for Electronics Research Inc. (ERI), a Chandler, Ind.-based manufacturer of antennas, towers and peripherals.

"When you're talking about DTV, you winnow out the guys that are running around changing light bulbs," he said.

A Dielectric TFU-20GTH antenna is installed at KBJR-TV of Duluth, Minn.

Harland noted that the process of reaching full power merely begins with identifying what type of antenna is necessary.

"From there, the next step is the structural analysis," he said. "The tower is often fine for the load, but many times, the tower can't handle the erection stress of having the antenna installed."

NEW TOWER STANDARD

The standard for tower construction and modification is also about to change. As of Jan. 1, 2006, all new towers and modifications of existing ones must meet EIA/TIA/222-G 2005, the most exhaustive revision of the standard since the mid- to late-'80s, according to John Erichsen, former vice president of engineering for Plymouth, Ind.-based tower manufacturer, PiRod (now owned by Valmont). Erichsen is now principal of EET Llc., a structural engineering consulting firm in Granger, Ind., and was a member of the editorial committee that drafted "Rev. G."

"If you're modifying or adding an antenna—anything but regular maintenance, you'll have to bring the tower up to the new standard," Erichsen said.

Tower structure is pretty much defined by wind, and Rev. G calculates wind load differently than the previous standard. The American Society of Civil Engineers developed numerical models for wind and ice loads in the late '90s, and these are now incorporated into tower construction/modification standards for the first time, Erichsen said

Rev. G considers several factors, such as how the tower will be used, e.g., for ham radio, 911 relays, television, radio or cellular antennas. The "exposure factor" considers "whether a structure is in the middle of a cornfield, or in an urban environment or near a large water body," Erichsen said. "It helps the designer determine if wind will be disrupted by the structures around [the tower]," he said.

All tower modifications will require a "rigorous structural analysis on the entire structure and everything that's on it," which could take anywhere from a week to a month, depending on the availability of information, Erichsen said. "On an old tower, you may have to go out and measure. It could take more time, depending on what's going to be done to the tower."

Erichsen suggested that "antenna manufacturers have to get their hands around this, because their antennas essentially define the parameters of tower structure." Rev. G is available from Global Engineering Documents at *http://global.ihs.com*. ■

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Expandos

CONTINUED FROM PAGE 16

said. "We are currently servicing contracts for many clients, including CBS, Fox Sports, MSG and ESPN, and events including X-Games, Great Outdoor Games, PGA, MLB, NHL, the NBA, and the NFL."

Game Creek Video manages a fleet of 17 trucks, of which 10 are production trucks and seven are support trucks. Of the 10 production trucks, three are HD/SD multiformat units capable of 1080i, 720p, as well as a simultaneous SD feed.

"All three HD trucks were built on a very accelerated schedule over the last 14 months," said Pat Sullivan, president of Game Creek Video in Hudson, N.H.

"What's happened over the last 18 to 24 months is that every major sports event has gravitated to HD. So, demand has been very high and it's absolutely growing."

Identical in layout, Game Creek's Patriot and Yankee Clipper HD trucks include Grass Valley Kalypso HD production switchers; DNF ST-300 slow-motion controllers, and Calrec Alpha 100 digital audio consoles, which are surround sound-capable.

The third HD truck, Freedom, has a Calrec Sigma digital audio console, which Sullivan said is slightly less powerful, but gives Game Creek increased flexibility to meet customer needs. The trucks also have Sony HDC-1500 HD cameras and a full complement of Canon lenses. All three 53-foot expando HD trucks were designed around PESA Cheetah routing systems mounted in 128 x 128 frames for HD; 24 5x 256 for analog SD video; as well as a 512 x 512 Nvision AES-EBU digital and analog audio router.

CORE STRENGTH

"These routers are the key to the strength of our trucks," Sullivan said.

There's also a PESA 3500PRO series system controller, with a Windows-based user interface facilitating rapid configuration of multiformat signal distribution and master control switching.

"Our trucks were designed to be flexible and quick to get into action," said Sullivan. "Once the client sets up the flow of the truck—such as seeing this camera in this monitor and that DDR in that monitor—the router controller retains those settings onto a CD. When that director returns to that truck, we plug those settings back in and restore the truck to the configuration used on the previous event—a process that can save two or three hours of set-up time."

Game Creek Video's HD trucks have been used by ESPN, Fox Sports, and the YES network. Since it was founded in 1993, Game Creek has provided trucks for virtually every major sports event, including the Super Bowl, Major League Soccer Cup, the NBA Finals, The World Series, and the Kentucky Derby.

GROWING GRACEFULLY

"With upcoming NFL and college football games being broadcast in HDTV, demand has dramatically increased for HD sports production trucks. Also, it seems that with some of the major broadcasters announcing they will come out with their own HD channels, such as Fox and MTV, we may eventually see the industry respond by building more HD trucks," said Mike Werteen, vice president of production and marketing for New Century Productions in Philadelphia.

NCP's seven-truck fleet includes three SD trucks that have been fully refurbished for multiformat HD; along with four SD-only trucks. These include NCP IV HD and NCP VII HD, 53-foot expando trailers, which carry 12 Ikegami HDK handheld cameras and Canon lenses, including two Canon XJ 100 x 9.3 and five Canon XJ 86x 9.3, all with image stabilization.

The third 53-foot expando, NCP V HD, stocks 16 Thomson LDK-6000 Mk II Worldcam handheld cameras as well as 10 Vinten Vector 700H pan heads on Matthews tripods and dollies. All three have Chyron Hyper Duet live graphics systems with upconverters; Abekas DVEous Dual-Twin HD DVEs; Grass Valley Kalypso HD production switchers; and EVS HD recording and playback systems.

Eventually, Werteen said NCP will renovate one or more of its remaining SD trucks for HD, provided the trucks haven't been on the road too long and are roomy enough to support an HD environment.

"We don't merely swap the SD equipment for HD, we completely revamp the truck's infrastructure and wiring to support HD," Werteen said. "Right now, we feel confident with the amount of HD trucks we have servicing our core clients. As new opportunities arise, we'll determine if the time is right to add one or more HD production trucks." ■

"What's happened over the last 18 to 24 months is that every major sports event has gravitated to HD. So, demand has been very high and it's absolutely growing."

—Pat Sullivan, Game Creek Video

Telcos Spur Growth for IP Set-Tops

Traditional box makers battle it out in new market

by Mark R. Smith

ATLANTA & SAN ANTONIO, TEXAS

Scientific-Atlanta has announced a new line of IP set-top boxes for the consumer market.

Integrated with the Microsoft TV IPTV Edition software platform, the new boxes will support advanced codecs such as MPEG-4 Part 10/H.264 and VC-1; include SD, HD and whole home SD/HD digital video recorder devices; and serve as gateway products that can serve an entire home with a single device.

On the heels of that announcement came another from SBC Communications, awarding contracts to SA and Motorola to deliver IPTV set-top boxes to enable its customers to access TV programming, video-on-demand, interactive applications and other features that are part of SBC's U-verse service.

The announcements are a sign that the market is heating up, as they come about a year after Verizon and Motorola entered the telco TV market with a joint venture.

BRACING FOR THE BOOM

The new set-top boxes from SA will support a "no new wires" strategy for operators, enabling IP video to be delivered over coaxial cable that is already installed in millions of homes.

To help expedite implementation, country- or region-specific versions of the new SA set-tops will support U.S. or international standards to prepare for what David Alsobrook, director of IPTV products for SA, thinks will be a big market.

"There have been many technical changes that have poised the IPTV market to take off," Alsobrook said, looking toward SA's volume rollout date of mid-2006. "The new codecs allow twice the amount of compression that was allowed with MPEG-2."

That means today, SA customers with an IPTV set-top can receive multiple screens of HD and SD video at home.

"That will eventually allow a company like SBC to offer service that is competitive with cable or satellite service," he said.

Another important element in the success of an IPTV deployment is minimizing installation costs.

To achieve this, Alsobrook said, "Adding IP over coax to set-tops allows the operator to use existing coax wire in the home to distribute, thus avoiding the costly alternative of laying Ethernet cabling in the house."

He also said that using highly integrated silicon solutions contributes to making the set-top boxes very cost-effective.

Alsobrook said the technology is in testing at present, which is an especially crucial step because, "We need to ensure that this new round of IPTV services offers a robust array of services to make it competitive and scalable to a large subscriber base."

Last year, SBC Communications announced "Project Lightspeed," a plan to expand its fiber-optic network, with the intent of "making IP-based voice, video and Internet access available to 18 million households as part of our initial build within our 13 state territory," spokesperson Denise Koenig said.

Deploying fiber and adding new network equipment through a deal with Alcatel will allow SBC to increase bandwidth from 20 to 25 Mbps downstream, as well as offer IP-based voice, video and Internet access, she said. "By increasing the bandwidth, we can offer our new U-verse service by the beginning of 2006."

SBC has opted to deploy SA, as well as Motorola, set-top boxes.

"We chose to work with two [companies] because of the competitive supplier agreement and because they offer high-quality products at competitive prices," Koenig said. "They both met our specs, as well as the timing of the release of U-verse.

"Our customers have told us that video is an important part of the communications and entertainment bundle," she said, adding that the company already offers SBC Dish Network via a partnership with EchoStar Communications, so the new IPTV service will be an alternative.

The set-tops boxes will allow SBC to offer whole home DVR and other new services, such as multiple picture-in-picture technology that is not based on a tuner, and instant channel changing, which eliminates lag time.

Scientific-Atlanta IPTV set-tops will use the Microsoft OS.

SBC will also employ two-way switched video technology, so the content resides on its network instead of in the customer's set-top box. That clears the way for more bandwidth on SBC's end for a larger video-on-demand library.

ANOTHER APPROACH

Verizon got into the game earlier, signing a deal with Motorola in October 2004 to provide Verizon's FiOS TV and FiOS Broadband set-top boxes to its customers.

"We are also working with Microsoft on the middleware for those boxes," said Mark Marchand, spokesman for network and technology at Verizon, who added that they will hit the market "when we start selling video this fall. We are getting ready for commercial launch. We already have deals with local video franchises that will enable us to reach hundreds of thousands of potential customers."

That number grows daily, Marchand said, while pointing out that Verizon took a different technological approach to the product.

"Instead of using copper wire, we are using fiber all the way into the house. We have been deploying that infrastructure for a year. By the end of 2005, we expect to have 'fiber to the prem' [short for premises] available to about 3 million homes and small businesses in parts of 15 states."

That gives Verizon "a huge amount of capacity that no other phone or cable company has and a dedicated broadband circuit to the home," Marchand said. "We are already offering five, 15 or 30 Mbps, which no one else is doing."

The fiber also has the capability for an 850 MHz video channel. Marchand said the company would be selling the video technology this fall.

"It's an RF technology that cable companies are using to sell cable to homes today," Marchand said. "We plan to have an IP product available in a year or so, but today, we use the reliable, proven technology that is similar to what cable companies are using." ■

Sports

CONTINUED FROM PAGE 18

work to nearly 100 contributors across the country to cover events, local and college teams, and national issues. The network is creating new studios in New York and Los Angeles, as well as at the SportsLine headquarters in Fort Lauderdale, Fla.

Audio programming of varying lengths is also on the menu, served up as PC links and podcasting feeds to iPods and Blackberry devices.

"We aren't constrained by the television limitations of half-hours or blocks," Kramer said. "We're experimenting with everything—it's a brand new medium. We're all learning as we go; we'll be testing everything with the users."

And, thanks to corporate sponsors, all the new features are free to users, that is, except fantasy game listings. An exclusive sponsorship by Nike kicked off the new SportsLine.com enhancements.

"There's nothing that a linear broadcast can do to compete with a totally customized experience."

—Larry Kramer, CBS Digital Media

Other sponsors already on board include Blackberry, Visa, Volkswagen, Geico, Subway, CDW and UPS. ■

Legislation

CONTINUED FROM PAGE 1

What remained to be worked out was how much money would be dedicated to a subsidy fund and who would be eligible to receive it.

House committee members were said to be wrangling for a number between $500,000 and $1 billion. A bill introduced earlier this year in the senate by Sen. John McCain (R-Ariz.) earmarked $463 million for the nation's 9.3 million households that do not exceed twice the poverty level according to estimates from the General Accountability Office. McCain's bill, the SAVE LIVES Act, required that the spectrum used for analog broadcast television be available to first responders as of Jan. 1, 2009. SAVE LIVES was never brought to mark-up in the Commerce Committee, a fact that McCain opined on the Senate floor during a Sept. 13 debate on an appropriations bill.

"Here we are nine months into the first session with another horrible disaster having taken place, and Congress has yet to take up the SAVE LIVES Act or any other legislation providing first responders their promised spectrum," he said. "To what level of crisis must this country endure before we act? Is the devastation from Hurricane Katrina still not enough to bring action? Chairman [Ted] Stevens has stated his intention to include such legislation in the Commerce Committee's response to budget reconciliation. I will be watching to see if the broadcasters find a way to once again delay the hand off of this spectrum to first responders. I will do all I can to move our legislation."

On the House side, Barton was said by a source there to favor the subsidy figure in McCain's bill, while others on the committee were willing to go as high as $1 billion. The overall amount depended on how many D-to-A converters to supply per household and to which households—points that were also still being debated.

The final draft of the House DTV bill was expected to be circulating around the time this issue of **TV Technology** hits the streets, so the Budget Committee would have time to work it into a reconciliation bill scheduled for mark-up the last week in October.

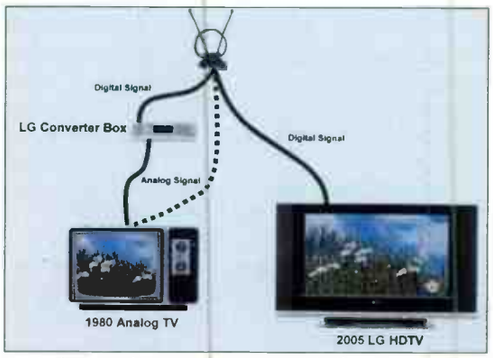
Many lawmakers consider D-to-A converters a necessary element of a DTV bill because without such a device, shutting off analog broadcast systems would instantly render as many as 70 million television sets obsolete.

Consumer electronics manufacturers have testified several times before Congress that they can turn out reasonably cheap D-to-A converters once a deadline is set.

Four companies—LG, parent company of Zenith, chip maker Zoran, Motorola and Thomson—demonstrated their prototype D-to-A technologies in the Rayburn House Office Building last month. Using a 25-year-old tabletop Zenith TV hooked to a Silver Sensor antenna, LG showed how a legacy set could display digital television signals.

Using a standalone set-top that's not available on the market, LG used the fifth-generation reception technology that overcame multipath interference at DTV test site NYC300, where previous generations failed. (Although subsequent findings indicated that front-end tuner design also contributed to the success of the fifth-generation technology at the Manhattan apartment where digital reception is notoriously bad due to multipath.)

LG was also showing a nonworking prototype of its finished product, a 6.5-by-1.5-by-4.3 inch box weighing less than 2 pounds. It will also use the next generation of LG DTV reception technology, known as 5G-plus, a company spokesman said. The LG D-to-A converter could retail for $50 in '08, "assuming millions of units" are ordered, according to LG.



Digital-to-analog converters would allow legacy analog television sets to work after the analog broadcast system is shut down.

One representative of a major electronics retailer said orders will indeed be placed for converters once a hard analog shut-off date is set by Congress.

All the D-to-A converter prototypes at the demonstration were hooked up to small indoor antennas, and all participants had side-by-side screens of analog and digital reception, including multicast channels.

Like previous DTV reception demonstrations at the Rayburn, the converter demo was held in a room where the windows face a courtyard walled on all sides—a fertile environment for multipath.

Some interference in the form of snow was evident in the analog signals, but it wasn't enough to cause the digital signals to drop during nearly an hour of observation. The weather was dry and partly cloudy, and while companies making DTV reception technology claim rain does not cause interference, it can exacerbate multipath in urban environments.

All the technologies appeared to work with similar efficacy. ■

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LINEAR ACOUSTIC

Surround Sound Solved

Photo: Steve Jordan

NET SOUP — Frank Beacham

Making Podcasts More Personal

Podcasting arrived out of nowhere, knocking the wind out of the "expert" prognosticators. While the established media outlets scrambled to make sense of it, a few talented small-scale producers sneaked under the radar, finding new global audiences without having to pass muster with the usual gatekeepers.

It has been a glorious eruption of serendipity fueled by a confluence of events—mainly the boost in broadband connectivity, and Apple's iPod/iTunes combo, which now automatically downloads and aggregates podcasts.

With broadband costs still plummeting and estimates that one in 10 adult Americans—about 22 million people—now own a portable MP3 player, podcasting could have a bright future.

Today, most podcasts are in the form of audio. That, of course, will change. Video podcasts will become more widespread as bandwidth increases, compression improves, and a new generation of personal media electronics hit the market. Look for that to begin this holiday season.

Podcasting, because it works through an on-demand subscription, has introduced many to their first taste of hyper-personalized media. The concept clearly demonstrates the attractiveness of on-demand programming to audiences.

ENTER THE POD PEOPLE

As users, we can subscribe to what we choose and hear it when we like. The old geographic boundaries of broadcasting are erased, while time shifting is totally on the terms of the listener.

However, with podcasting, the personalization goes further. There's a quality to many podcasts that's fresh, homemade, intimate and anti-corporate. Some are based simply on the podcaster's love and enthusiasm for the subject. Many don't try to sell anything. The best podcasting is from the heart.

There's a bit of the outlaw quality of pirate radio in good podcasting. Even if the production is not slick, we like it because we know deep down that the gatekeepers have no power to run it through their great homogenization machine.

We like the idea of having access to anything we want, whether it be an eclectic talent on a far-away radio station or an individual musing on politics in his underwear sitting at his kitchen table.

So much for the romanticized *idea* of this powerful new medium. Unfortunately, this quaint vision is not yet the reality. It's one thing that podcasting technology is here, but it's another to create a compelling podcast that significant numbers of people want to hear.

Just as the advent of word processors didn't increase the amount of good writing, or home recording gear didn't result in better recorded music, the fact that we can now do low-cost one-to-one broadcasting does not make the programming compelling.

Yet, the potential is there and that's exciting in itself.

As with any media, a good podcast requires that its creator have the talent to tell a good story. Without that ability, nothing else matters. No amount of technology will save the show. Assuming the story skills, however, the sky is now the limit for the creative podcaster.

Already, podcast media—by its very nature—is moving into exciting new territory, a frontier where the individual can be more deeply immersed into the story than ever before possible. Let's hope we're at the beginning of a new creative period in media that will bring exciting and unexpected things.

Sony MZ-M100 Hi-MD Minidisc portable

By using the written word, the late writer Hunter S. Thompson created gonzo journalism, a compelling style of reporting in which the creator—rather than be a passive observer—becomes intrinsically enmeshed with the story he is telling. This gonzo style, when created with a deft touch, brought freshness and excitement to the written word.

We like the idea of having access to anything we want, whether it be an eclectic talent on a far-away radio station or an individual musing on politics in his underwear sitting at his kitchen table.

Podcasts lend themselves well to a gonzo-type treatment. In recent days, I have been exploring some of the tools now available that can help creative podcasters move beyond the boundaries of the studio to create more immersive productions.

I've found that history is repeating itself. As it has been with most emerging media forms, the early tools were originally designed with something else in mind. There must at first be a period of adaptation of both technology and technique.

Most professional audio gear is designed for electronic newsgathering and music recording. Very little has been designed for use by a single individual focused on creating the story.

The challenge of some podcasts is for a single person to move unobtrusively in the field and record high-quality digital audio without having to pay undue attention to operation of the gear. That's easier said than done.

At first, I looked at a new generation of flash memory-based recorders to find this ultra compact, simple-to-use recording package. I quickly found that higher-quality recorders designed for broadcasting tend to be too bulky. That led me to business and prosumer technology.

Olympus DM-20

Some new pocket-sized recorders, such as the Olympus DM-20, offer decent Internet sound quality in a stealth-size package. For example, the DM-20 ($289.99 list) can record a couple of hours of stereo audio in the Windows Media Format (WMA) on its internal 128 MB of flash memory.

In its best quality 44.1 kHz mode, it can deliver a frequency response ranging from 300 to 8,000 Hz—a decent tradeoff of sound quality versus a weight of less than 3 ounces. This little recorder can do the job in many podcast applications.

However, for much better location sound for an amazingly compact device, the new Sony MZ-M100 Hi-MD Minidisc portable wins the competition. In fact, it has podcasting written all over it. Introduced at summer NAMM, this is an entirely new breed of Minidisc—one with the ability to record uncompressed linear 16-bit PCM audio and turn the takes into files for editing on a computer. It's the first MD recorder to allow the movement of WAV files to both Windows and Macs. The price is $439.95 list.

This new generation MD recorder uses 1 GB MiniDiscs, allows up to 94 minutes of uncompressed recording time, and as much as 34 hours using the Sony ATRAC3 Plus format. It comes with an excellent stereo microphone and offers long battery life. We tested it and found it an ideal unobtrusive personal recorder for podcasting.

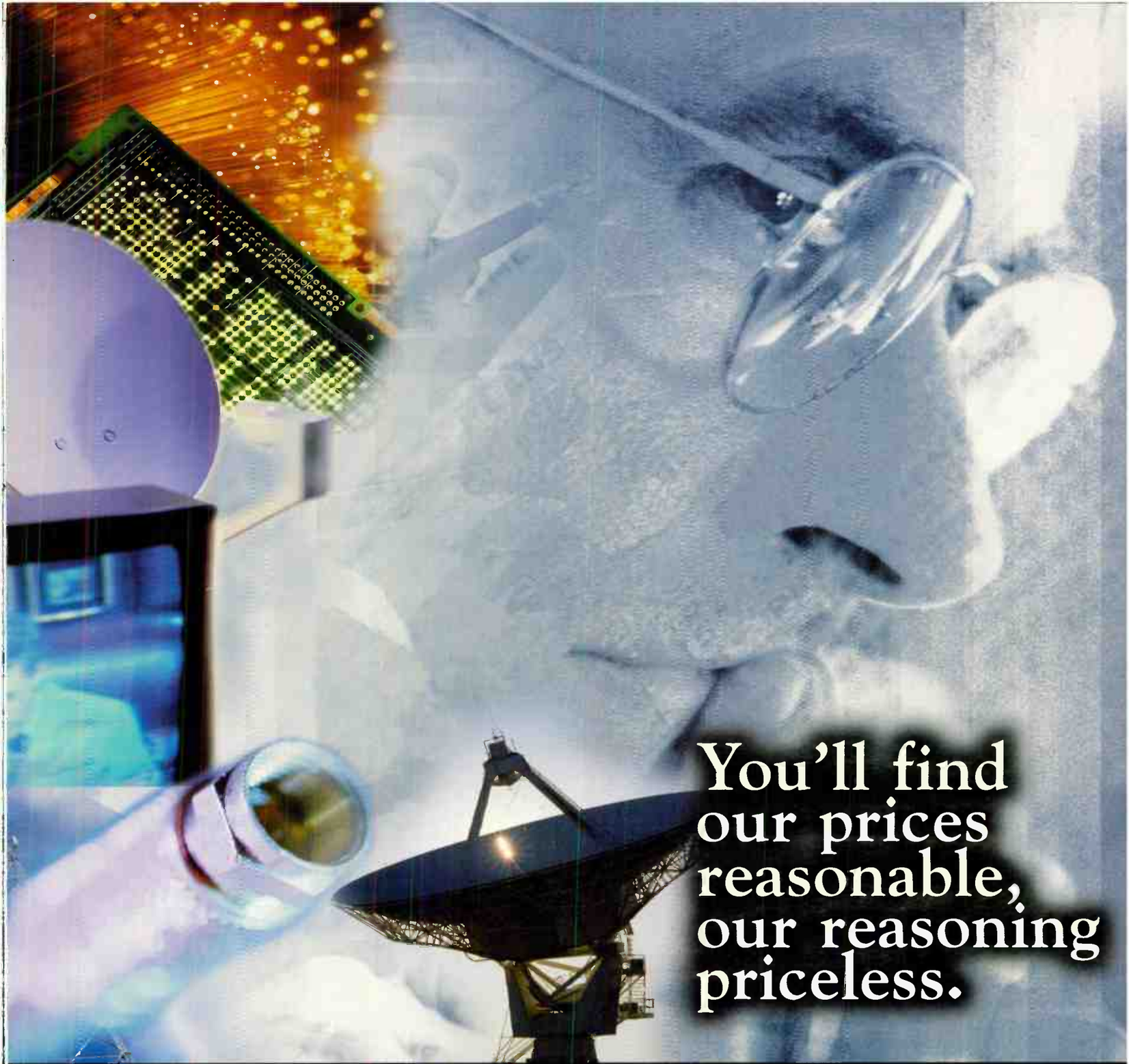
These are just two products that we evaluated. There are some excellent resources that sell, service and advise users on ultra-portable gear, stealth and binaural microphones, and other audio goodies that allow experimentation with immersive personal podcasts.

A great source is Len Moskowitz's Core Sound, a specialist in binaural microphones and portable recording. Visit *www.core-sound.com*. Another is Sound Professionals at *www.soundprofessionals.com* and Oade Brothers Audio at *www.oade.com*. Check out Oade's excellent "Tapers Section" for practical advice on field recording, especially of music.

Finally, for great resources on audio storytelling, visit Transom at *www.transom.org* and on the latest in podcasting, go to *www.podcastingnews.com*.

It's an exciting time to create new media and find an audience for it. The question is, who will see the opportunity and seize the moment?

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



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TECHNOLOGY CORNER — Randy Hoffner

1080p Displays: In Search of Applications

If you have attended any recent tradeshow featuring displays or paid attention to the display press, you will have seen and heard about 1080p displays. You will no doubt remember that in the early days of HDTV, which we might call the "CRT days," one of the pearls of conventional wisdom was that a consumer display capable of resolving 1920 x 1080 HDTV images was not available. That wisdom was accurate then, but the display picture, so to speak, has changed markedly since then.

We are now moving well into the advanced display era. CRTs are rapidly vanishing from showroom floors to yield space to LCDs, plasma panels and rear projection displays. A shopper can almost hear the thud of falling flat panel prices over the past year or so, and careful listening will reveal the sound of display manufacturers scrambling to replace lost revenue. One way is to offer 1080p displays.

The realities of the advanced display marketplace today have brought about developments on both ends of the resolution spectrum. As prices for HD flat panels drop, fewer extended-definition flat panels are being offered. We are hearing a great deal about 1080p displays, which are becoming available in a variety of sizes and technologies. Looking at some recent information on advanced display sales, we can get a snapshot of the 1080p display landscape. Sixteen 1080p flat panels in sizes ranging from 37 to 65 inches are reportedly becoming available this year. It is reported that panels 45 inches and larger will be priced prohibitively, but smaller units will carry attractive price tags.

More than 35 models of 1080p rear-projection TVs using technologies that include liquid crystal on silicon and digital light projection are reportedly becoming available this year. No 1080p LCD rear-projection sets are expected this year, even though LCD is the top-selling microdisplay technology in the current rear-projection marketplace. This is likely because manufacturers are still working on reducing a 1920 x 1080 LCD die to an appropriate size. We may expect this state of affairs to be rectified in 2006. It is further expected that large 1080p plasma panels will become available later this year.

The Samsung HL-R5688W 1080p DLP high-definition television

NOWHERE TO GO

Now that manufacturers have 1080p displays to sell, one of their problems is a lack of 1080p programming to display. It is, in fact, reported that only two manufacturers will offer 1080p inputs on their displays, and these will be VGA inputs. The VGA interface will accommodate computers, but no DVD player or set-top box is expected to VGA outputs. The crop of 1080p displays will take in 720p, 1080i or SD television formats, which must be converted and/or de-interlaced. The astute observer knows that this provides an opportunity to degrade images.

No one yet knows how the HD-DVD/Blu-ray battle will come out, but it is known that the first generation of both formats will have 720p or 1080i outputs, but not 1080p.

We well know that the ATSC broadcast standard can accommodate 1080/24p and 1080/30p, but not 1080/60p. There does not currently seem to be any movement toward producing equipment that can record or transmit 1080/30p. We well know that much television post production is done in the 1080/24p scanning format, with source material being obtained by the transfer of 24 fps film to video or direct 1080/24p video capture.

Although 1080/24p is included in the ATSC standard, 24p video is not typically, if ever, used. Such material is converted either to 720p/60 or 1080i/30 with the addition of 3:2 pull-down before being broadcast, so we are back to upconversion in the receiver before it can be displayed as 1080/60p in the home.

There is a 1920 x 1080 studio/field video camera capable of 4:4:4 RGB output at 1080/60p, but no mention is made of any device that might be used to record or edit the images. The data sheets indicate that it is also capable of HD-SDI outputs at 1080/24p and 1080/30p, as well as 720/60p and 1080/30i.

It is, at this juncture, impossible to successfully compress 1080/60p to fit into a 6 MHz U.S. television channel using the MPEG-2 compression tools available to us. It is, in fact, quite difficult to successfully compress some 1080/30i material to fit into a 6 MHz television channel using these tools.

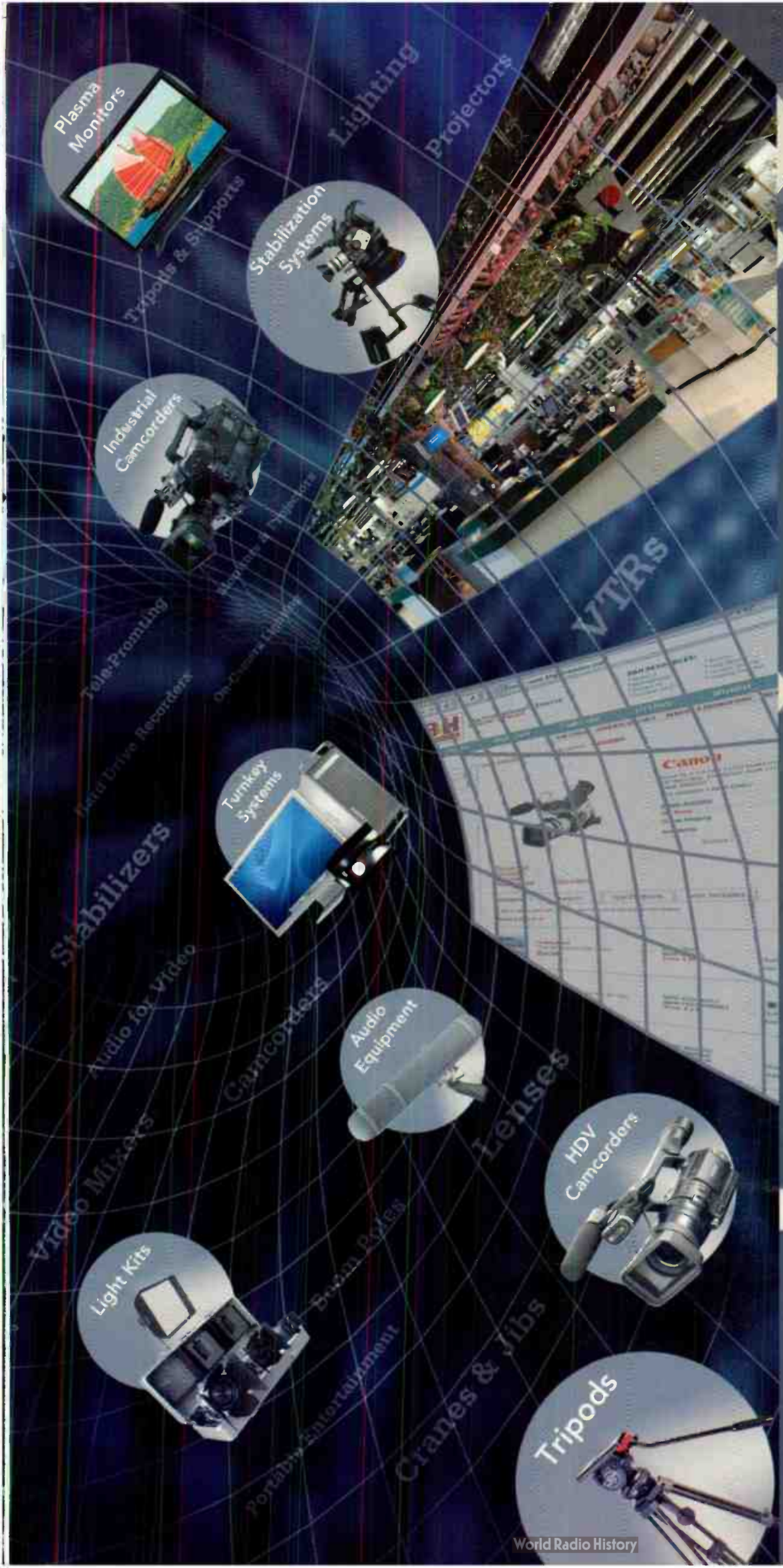
We have learned that European HDTV broadcasting will very likely use MPEG-4 AVC compression, as the Europeans have the advantage of beginning with a "blank sheet of paper" when they initiate HDTV service in the near future. It is difficult to conceive of the U.S. ATSC broadcast standard being changed to make use of MPEG-4 compression, since this would disenfranchise the owners of all the MPEG-2 DTV receivers in the field.

Even with the announced coding gains provided by MPEG-4 over MPEG-2, it would seem to be difficult at best to successfully code 1080/50p into even a 7 or 8 MHz European television channel, even using MPEG-4. In fact, as you have read in this publication and elsewhere, the European Broadcasting Union is recommending broadcasting HDTV at 720/50p.

What 1080/60p native signals are available for display on these visually stunning 1080/60p displays? We are told that the PlayStation 3 console will have a 1080p output with games released on Blu-ray discs. We are also told that there are 1080p movie trailers available on the Internet. But wait! These started life as 24fps film, so are they really 60fps?

In sum, the resolution capabilities of advanced displays have caught up to the resolution of the 1920 x 1080/60p HD scanning format, but it will be a while before there is much native 1080/60p material available for viewing.

Randy Hoffner is manager of technology and strategic planning in New York City. Write to him c/o ***TV Technology****.*



INTO THE SOURCE

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MEDIA SERVER TECHNOLOGY

Karl Paulsen

Tools and Practices for Managing Media Storage

The reliability of media server systems and their storage networks continues to be a growing factor in determining which systems are employed and how. As the systemization of these components becomes more integrated into operational workflow, the complexity increases, and the dependency upon them grows. In turn, the associated storage systems command an even higher reliability factor.

In turn, the process of managing these storage networks becomes more important, and the tools needed to make critical decisions become all the more necessary.

Last month, this column described the issues surrounding the archive manager segment of an overall media server system; it seems appropriate to continue the discussion, so this month the topic will focus on the management of the storage network component.

Until the last few years, management of data on a video server was governed primarily by resident applications. When storage totals were less than 100 hours, this was not a difficult task. However, as newsroom editorial systems were required to handle a heavier workload, the process of managing storage began to require more complex system-level controls. Optimizing data, disk management, bandwidth, throughput and availability for the overall system became the goal.

Borrowing again from the computer world, video server manufacturers looked to enterprise data- and transaction-server systems to address very large-scale storage arrays, including storage area networks, the fabrics associated with them and distribution over wide area networks.

Short- and long-term management of these systems requires tools to support administrators and technicians tasked with the upkeep of these ever growing networks. The tools require the ability to identify, diagnose, repair and hopefully prevent critical faults. These tools can help establish parameters in which the enterprise can successfully operate.

GHOSTS IN THE MACHINE

One group of fundamental issues that can plague any system include catastrophic, intermittent or pathological failures, hardware and software upgrades and pure "bugs" in the system.

The suddenness of a catastrophic failure, because it is unpredictable, is for the most part obvious and usually straightforward to deal with. This failure may be small scale, e.g., a power breaker fails, an unsuccessful or a cooling fan that stops. Or the failure can be monumental, such as an entire controller fails with no backup, in which case all data retrieval ceases until the controller is physically replaced.

Redundancy still seems to be the best insurance policy for avoiding or mitigating a catastrophic failure, but it's not without significant cost. Disk mirroring, redundant arrays or subcomponents, dual system drives, dual power supplies and fans, etc., are well known measures that help protect the revenue-generating machine.

However, redundancy is only a Band-aid that buys the operator time to deal with the resolution. Redundancy can also be valueless if the backup system has not been exercised, and it, too, fails when called to duty.

Preventative maintenance, including trend analysis and tracking, will help mitigate risk; but an aggressive budget of spares and personnel training will alleviate possible risks that can only be assessed for effectiveness during the actual failover and often overlooked failback process.

Intermittent failure is by far the most difficult to deal with. Identifying conditions that cause the problem, finding an opportunity to "test" in a real-time operating environment, or having an expert analyst available to experience (let along diagnose) the problem are very real and untenable circumstances that ultimately become unmanageable during a crisis. Intermittent problems are generally viewed as bugs in the software or firmware.

Because bugs are often hard to reproduce, or the conditions in which they arise cannot easily be duplicated, bugs are usually the last thing to be resolved. All the testing in the lab or factory can never duplicate the myriad real-life applications created by end users.

Testing for pathological failure involves anticipating highly improbable conditions. Pathological test systems have been used in exercising serial digital video (SMPTE 259M or 292M) for years. For video servers and associated storage systems, the accepted method for basic pathological testing is to take the system limitations to their extremes. This could mean, for example, all the input coders running at full real-time ingest, all the decoders playing back full resolution simultaneously, while at the same time data is FTP'd between server and backup systems, and calling for the shortest possible back-to-back segment play-outs. Then as a last resort, physically yanking one of the drives from the storage array and forcing a data rebuild with its replacement drive installed.

This sort of example will tax the availability of the storage system and carries with it other possible connotations. In its generic sense, "availability" can be defined as the binary metric that describes whether a system is up or down at any given time. Statistically, the extension of this definition is used in computing the percentage of "up time" on a system. Traditionally, this is how percent-availability is defined—for example when a system has 99.999 percent (i.e., five-9s) availability. However, reliability and availability are not the same, although generally they are classified into the same perception. Reliability is a long-term metric, availability is a continuous, almost instantaneous metric. A system may be highly reliable because it is seldom used; while a system may be highly available up until the time it becomes unreliable.

READING THE TEA LEAVES

Storage systems administrators seldom have the time to evaluate potentially harmful conditions that might affect availability or reliability. As an aid to the administrator, storage vendors are providing data to the operating or control systems of either the server itself, or to an external monitoring platform (sometimes through SNMP, often through dedicated or resident analysis routines). This data is accumulated into groups designed to watch the performance of the system at all levels. Often referred to as "trending data," this information is valuable in determining when a drive or other subsystem is nearing the fault point. Trending data can be set with thresholds that become statistical boundaries whereby a flag is raised and preventative action can be taken before a failure brings the system down or reduces performance beyond an acceptable level.

Trending data for ascertaining if the storage system meets its benchmarks is comprised of fault categories. These include items such as correctable media errors on reads and writes—used to simulate disk sectors starting to go bad; uncorrectable media errors on reads and writes—to identify unrecoverable- or damaged-disk sectors; hardware errors on any SCSI command—to identify firmware or mechanical errors; parity errors at the SCSI command level—indicating possible SCSI bus problems; power failures, such as increased current or voltage changes at all levels; and disk hangs forcing firmware bugs or failures both during and between SCSI commands (these appear as SCSI timeouts to the controller). The majority of these items would seldom be reviewed on a continuous or daily basis. However, with trending thresholds and other indicators fully established, the reliability of the overall system is improved with only a modest level of active administration.

A system may be highly reliable because it is seldom used; while a system may be highly available up until the time it becomes unreliable.

Many analysis and monitoring systems are connected through a Web browser interface, allowing for the extensibility of the monitoring platform well outside the physically hard-wired connections of half a decade ago. Through HTTP, XML or Java-scripting, the trending and status information can be readily available to a variety of third-party external monitoring systems.

NAVIGATING AN UPGRADE

The most risky task in managing the overall storage network is the systems upgrade. Both hardware and software updates are potentially the most difficult of the administrator's tasks. When performing an upgrade or incremental fix, be mindful of the influence and interplay of all associated systems. Often, editorial components, MOS-enabled third-party systems, facility automation systems and dozens of others can be affected. Furthermore, if operating system parameters are changed, new anomalies are introduced that must be worked through at all levels of the systems. Whenever contemplating an update or upgrade, be sure all associated components remain compatible. Check with each secondary and third-party vendor to ascertain if they are aware of the new version and if they have actually qualified it with other components. Keeping hardware and software versions synchronized is a challenge that complicates system performance, reliability and availability.

In conclusion, for years the broadcast and media technology industries have been preparing current and new installations for the inevitable near lights-out or hands-free operating environment. In support of this, major vendors of broadcast terminal equipment, on-screen displays and video servers have offered the tools to manage their systems on a tiered basis—e.g., initial fault identification, elementary diagnostics, long-term or deep analysis with trending, and in some cases, even automated failover or corrective action. As the entire broadcast chain moves further from base-band video toward a file-based architecture, storage management—coupled with training and simulation—will become a part of this tier-level service practice, especially when integrated into the centralization of both surveillance and operations.

Karl Paulsen is vice president of engineering for AZCAR. Contact him at karl.paulsen@azcar.com.

RF TECHNOLOGY

Doug Lung

So Just How Hard Is it To Receive DTV?

Earlier this summer, an interesting debate developed around the FCC Notice of Inquiry on "Technical Standards for Satellite-Delivered Network Signals" over how to determine whether a household can receive a local network affiliate's DTV signal over-the-air. Households that can receive a local network station are not allowed to receive a distant network DTV signal via satellite. The debate pitted EchoStar against broadcasters.

Both sides used engineering exhibits prepared by reputable consulting firms to support their arguments. The exhibits present an interesting picture of how difficult (or easy) it is to receive DTV signals. All filings are available from the FCC's Electronic Comment Filing System at *http://gullfoss2.fcc.gov/prod/ecfs/comsrch_v2.cgi* (search for Docket 05-182).

Hammett and Edison provided the engineering to support EchoStar's request for much tighter standards for over-the-air DTV reception.

I'm sure many broadcasters were surprised to see H&E's name on the exhibits, as many of H&E's clients are broadcasters and one of their senior engineers is on the board of directors for the Society of Broadcast Engineers. The H&E exhibit raised concerns about the applicability of the FCC planning factors and the performance of DTV receivers and set-top boxes.

H&E's statement supported EchoStar's assertions that: the FCC's signal level for reliable DTV reception was too low; the impact of multipath on DTV reception has to be considered; the FCC's reception standards should consider the use of indoor antennas or mispointed outdoor antennas; current DTV receiver performance falls short of the FCC's DTV planning factors; and because DTV reception does not degrade gracefully, the FCC must give more consideration to time variability when in determining DTV reception.

Engineering provided by the firm Meintel, Sgrignoli and Wallace was used by the National Association of Broadcasters to show that equipment used to receive ATSC DTV signals is improving and in some cases exceeds the parameters used in the FCC planning factors.

William Meintel wrote the coverage and analysis software used by the FCC in creating the FCC Table of Allotments and the software the FCC used in processing DTV applications. Gary Sgrignoli is a recognized expert on ATSC transmission and reception. Dennis Wallace is known for his work on DTV field tests.

The MSW statement supports the NAB argument that the planning factors are a reliable indicator of DTV coverage.

It explains that rotors or multiple antennas can be used to ensure antennas are properly oriented. Where it is difficult to meet some planning factor parameters, readily available mast-mounted low-noise preamplifiers can be used to compensate for the additional losses. They also showed that signal strength is a good proxy for determining the ability to receive a DTV picture.

FACTORS

Let's look closer at engineering statements these two firms filed.

MSW spends a large part of its engineering statement describing the planning factors and the methodology behind them. MSW doesn't dispute that indoor antennas are worse than outdoor antennas, but argues that outdoor antennas are the logical choice since satellite antennas also have to be mounted outdoors.

Antenna pointing is not a major problem, since in crowded markets like the Northeast, the signals coming from another direction are likely to duplicate network programming. MSW also notes that while some antenna systems will not meet the gain criteria in the planning factors, this can be overcome by the use of low-noise mast-mounted amplifiers.

The FCC Notice of Inquiry asked whether DTV signal strength should be used to determine if a location was able to receive a DTV signal. MSW says signal strength is an indicator of DTV reception and that this is supported by field tests—15 separate measurement programs across 12 cities conducted between 1994 and 2001. The Grand Alliance blue rack receiver, which is known to have significantly worse equalizer performance than fourth- and fifth-generation receivers, was used in 11 of the 15 field test programs. Two of the tests used the second-generation receiver and the remaining two used third-generation receivers. None of the 15 tests used newer technology.

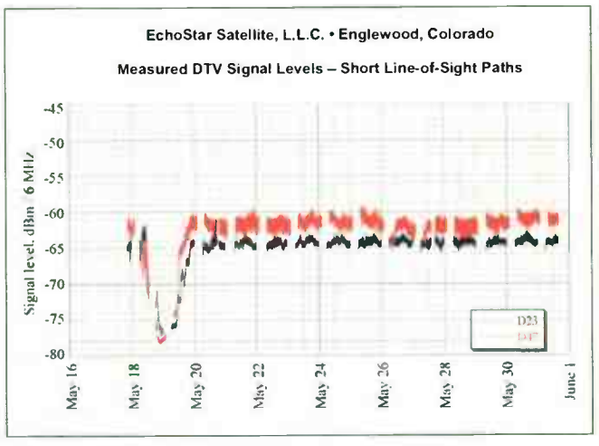

Fig. 1

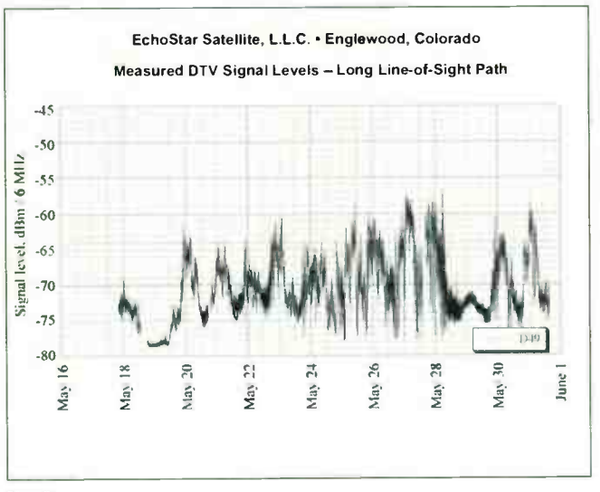

Fig. 2

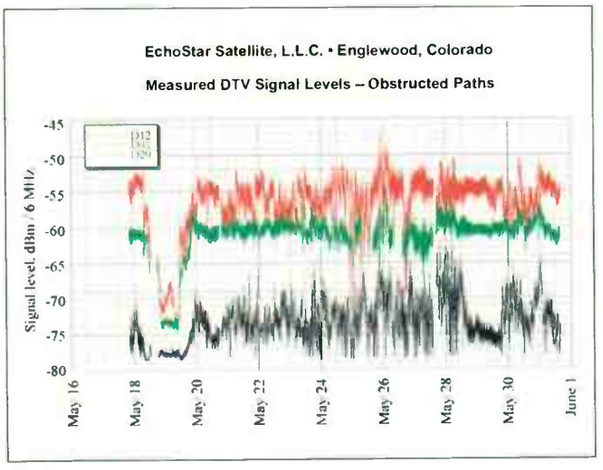

Fig. 3

MSW states the key statistic to look at in these tests is the System Performance Index—the percentage of sites with signal levels above the FCC minimum that had successful DTV reception. For the 15 test programs, the System Performance Index ranged from 76.8 percent for KING in Seattle to 98.7 percent for KICU in San Jose, both in 1998. The average for all the tests was 90 percent. In most cases where reception wasn't possible, MSW said the problem was multipath or interference. Newer receivers offer much better multipath performance.

For analog TV, the FCC allows the use of Longley-Rice to determine whether a house is able to receive a local analog TV signal. The parameters used for these studies are outlined in OET Bulletin 72. Unlike OET Bulletin 69 studies for DTV coverage, OET Bulletin 72 requires the use of finer terrain data, adds additional losses based on U.S. Geological Survey land-use data and adjusts antenna height based on whether the house at the location studied is one story (20 feet) or two (30 feet). MSW found than when the Longley Rice model was used as outlined in OET Bulletin 72, out of the 2,169 locations measured in the DTV field tests, it correctly predicted whether the signal would be above or below the noise-limited threshold at 2,047 or 94.4 percent, of the locations.

In support of EchoStar's comments, H&E's engineering statement says that its experience shows only a small percentage of households—"perhaps 10 to 15 percent"—with outdoor antennas also utilize a rotor. H&E took a random sample of 4.4 million calculation points covering the continental United States and found that the majority of these sites were

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LET THERE BE LIGHTING

Andy Ciddor

Divide and Conquer Your DMX Problems

In a lifetime engaged in the study of the multitudinous technical manifestations of the One True Universal Law (Murphy's, of course), I have managed to extract a single powerful theorem for use in fault finding: *It is folly to believe that similar symptoms are produced by similar faults.*

Jumping to conclusions without an approved safety harness is always a risky business that can lead to serious confusion, depression and even derision from ones closest colleagues.

Thus, to find problems in a complex system requires the adoption of a systematic approach to identify the precise location of the faulty elements. The approach that I have come to favor is to eliminate all of the correctly operating components, so all that remains are the faulty bits.

Photo: Andy Ciddor

Part of a 400-component DMX512 studio lighting system

Rather than beginning the search for faults at one end of a system and working your way through, the binary search method repeatedly divides the system in two.

I'm currently working with a client to locate an extremely intermittent and deeply mysterious problem in a multi-universe DMX512 distribution network. If what the head technician told me is correct (and I have deep reservations that this is the case), then we must arrive at the conclusion that nothing can be faulty, so the system should be working perfectly—which it manifestly is not. The only other conclusion available to me is the system is inhabited by some form of DMX ghost.

Now while the installation in question is a 170-year-old theater, and comes fully equipped with the requisite theater ghost, there is no reason, as yet, to suppose that this is the cause of the problem. I merely suspect the accuracy of some of the tests that they purport to have performed. Due to the very infrequent appearances of the fault, I haven't yet had a chance to verify the client's results. I have loaned them a DMX tester, with strict instructions as to how to test their system on the next manifestation of their rhythmic flickering problem.

There are a several popular methods for picking a starting point in your search for faults. Many people are in favor of starting at one end and methodically working your way

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DTV

CONTINUED FROM PAGE 36

expected to receive at least two NTSC signals at Grade B or better. However, at the majority of the sites predicted to receive signals from two or more stations, at least one of the stations is at an angle 25 degrees or more from another station, meaning that without an antenna rotor, reception of at least one station would be degraded by as much as 10 dB (low VHF), 12 db (high VHF) or 14 dB (UHF).

H&E's statement outlines the additional losses encountered with indoor reception, but does not discuss whether indoor antennas should be used for determining whether a household receives a DTV signal. Recognizing that many viewers are likely to use indoor antennas to receive DTV, this information is useful even outside of the satellite distant signal debate.

H&E notes that a PBS study found indoor antennas had, on average, a gain of -1.1 dB, in other words, a loss. This is about 10 dB below the gain assumed for outdoor antennas. A 1979 ITS study found even greater loss, with averages ranging from -2.8 dBd (high VHF) to -4.4 dBd (low VHF). The most recent study of indoor antennas was by done by Kerry Cozad at Dielectric. H&E says this study shows an average gain of 2.4 dBd for indoor antennas, 9.2 dB below the average gain of the measured outdoor antennas.

Of course, antenna gain isn't the only factor to consider. H&E point to a 1963 FCC study that found building penetration loss in less cluttered areas of NYC (outside Manhattan) were about 25 dB at VHF and 21 dB at UHF. In the most cluttered areas, UHF loss increased to 26 dB.

The H&E statement also includes data from a United Kingdom study comparing building penetration loss with the height of the building. In this study, UHF losses ranged from 16.4 dB at ground level to between 2.5 and 4.2 dB at the sixth floor.

In attachments to EchoStar's comments and reply comments, H&E addressed the issue of DTV receiver performance. They compared the sensitivity of six receivers—five consumer model receivers (four purchased in May 2005) and one professional model.

While the consumer receivers had better sensitivity than the professional model, only two met the planning factor sensitivity of -81.2 dBm at Channel 12 and none met the -84.2-dBm UHF sensitivity at any of the UHF channels tested. H&E estimated the margin of error for these measurements at +/-1.5 dB. H&E concluded that when all channels are considered, the typical receiver is 2.4 dB less sensitive than the FCC planning factors.

H&E discusses field tests, but considers only 12 measurement campaigns through 1999. It notes that in these tests, 12 percent of the locations that had the requisite signal strength did not have usable pictures.

For obstructed sites, this increased to 18 percent. For indoor reception, adequate reception was not possible at 26 percent of the sites.

H&E offers that future receivers may provide a picture at some of the sites that didn't work in the 1999 and earlier tests, but states, "these results illustrate that there has been a significant failure rate where consumers cannot receive DTV even though a theoretically-adequate signal level is present."

One of the more interesting portions of the H&E engineering statement concerns temporal variation of DTV signal levels. H&E measured the amplitude of 14 DTV signals over both obstructed and unobstructed paths at its Sonoma, Calif. offices from May 18 until June 1, 2005. Looking at the figures I copied from the H&E engineering statement, the variation in signal strength with time is obvious. The sharp drop in signal on May 19 was caused by what H&E called a "mild storm in the San Francisco Bay Area," where rain rates measured as high as 15.5 millimeters per hour.

Given the variations in signal strength, H&E recommends increasing the probability of reception at a given time from the 90 percent, which is what is currently used for predicting DTV coverage, to 99 percent. H&E states their study shows a UHF Channel 41 signal has to be about 17.5 dB above threshold to achieve 99 percent probability.

MSW's reply comments for NAB disputed the H&E studies and engineering statement. How could two well-respected engineering firms look at the U.S. broadcast DTV system from two different angles and come up with results that are so different? Next month I'll discuss MSW's answer to H&E's findings and offer my observations on these and other engineering statements submitted in the Notice of Inquiry.

Questions and comments are always welcome and appreciated. E-mail me at dlung@transmitter.com.

DMX

CONTINUED FROM PAGE 38

through the system. However, as a lifelong student of Murphy, I just know that such a search will always start at the furthest possible point from the fault, and thus require much fruitless effort. On average, you will have to test about half of the system before isolating the source of the problem. A 30-component DMX system (including console, cables, splitters, dimmers fixtures, etc) should require approximately 15 tests, but could require as many as 30 if Murphy prevails.

THE BINARY SEARCH

Instead, I favor a simple, yet elegant technique, known in the data processing business as the binary search. Rather than beginning the search for faults at one end of a system and working your way through, the binary search method repeatedly divides the system in two, discarding half of the remaining system with each test, and so rapidly zooms in on the faulty components. A 30-component system will require a maximum of five tests to locate the fault, no matter what.

Selecting the right midpoint can reduce the effort of fault location considerably. If only part of your system is exhibiting a fault, then it may be appropriate to begin your search at a point after the divergence of the faulty section from the rest of the system. However, it's also important to remember that some faults caused by data reflections in incorrectly terminated or joined networks can appear a long way from the source of the reflection.

Another factor to consider is that the starting point doesn't have to be at the absolute geographic center of the network, particularly if that place happens to be up a tower, in a flown truss system or deep below a temporary stage structure. If the fault is located in such an inconvenient place, your tests will lead you there soon enough without having to rappel down from the roof or climb under the stage to make the initial couple of tests.

After choosing a convenient midpoint in your system, break the network and insert your DMX tester, in receive mode, on the controller side of the break. If the data arriving at the tester is fault-free, then you have just exonerated the upstream half of your system and know to look halfway farther down the line. If however, the data arriving exhibits faults, then it's time to move halfway back towards the controller, to repeat the process and zero in on the source of the problem.

As a further check, insert the DMX tester, in transmit mode, on the receiver side of your chosen midpoint, and send out your test data. If the fault has disappeared, then you can be sure that its source lies upstream of your test point. If not, then it's time to move halfway farther down the line to continue your search.

The process is actually much simpler than it sounds in writing. The only difficult part (aside from having to clamber around in your DMX network cabling) is using your tester correctly. It's crucial to know what you should be seeing on your tester in receive mode, and equally vital that you are sending out a useful data stream in transmit mode. If the fault only appears in certain lighting states, then clearly that is what you should be sending from both the console and the DMX tester. In most other circumstances, it is useful to either send out a single static state on all channels, or send out a simple repeating pattern that will help to identify the location of the fault.

While DMX networks can be complex and messy conglomerations of cables and equipment, some careful thought, the right test gear and the application of a few simple rules should comfortably enable you to lay to rest your network ghosts.

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

INSIDE AUDIO | Dave Moulton

The Center Channel: Unique and Difficult

As you may recall, I've been reviewing the function of the various channel groups in surround sound, including a consideration of how they came to be, how they can be approached in various types of production, and how they end up being used by our beloved viewers in their homes. This month, I'll discuss the most challenging channel: the center channel. You can't live with it and you can't live without it! What're you gonna do?

Stereophony was "invented" twice, at approximately the same time (I'm leaving out a LOT of history here—full apologies to Clement Ader). In England, in the early 1930s, Alan Blumlein invented a series of two-channel devices (including microphone arrays, cutter head mechanisms and phono cartridges) that captured, transmitted and reproduced two correlated "stereophonic" signals that yielded, when played back by a matched pair of loudspeakers, a remarkable set of sensory illusions that fall into the family of audio we now call stereo. Central to these is an illusion called the "phantom image."

At roughly the same time (ca. 1933), in the United States, Harvey Fletcher of Bell Labs created a three-channel stereophonic system that utilized three microphones, three transmission channels and three loudspeakers.

The difference between these two systems is both simple and profound. In Fletcher's three-channel version, the center of the stereophonic illusion is "solid" in that it is represented by an actual sound source. In Blumlein's version, the center of the stereo illusion is "phantom," which is to say it is "inferred" by the human auditory system. How the human auditory system does this is fascinating and remarkable to me. I have spent the past 20 years observing and studying it.

Reduced to its essence, the phantom image is a brain-generated perceptual construct based on similar signals having (very roughly) similar amplitudes and (quite precisely) similar times of arrival at our ears. To perceive a phantom image midway between two loudspeakers, the identical signals must arrive at the ears within .2 milliseconds of each other. Otherwise, the phantom begins to migrate toward the earlier speaker. What this means is that for two-channel stereo, if the listener is more than six inches off the median plane (i.e. equidistant from the two speakers), the phantom will migrate to the nearer speaker. See Fig. 1 and Fig. 2.

This is a major limiting factor for two-channel stereo. It is central to our discussion of the center channel.

The first instance of released commercial stereophony has to be Walt Disney's "Fantasia," produced in the late '30s. Interestingly, the conductor was Leopold Stokowski, who participated in experimental three-channel stereophonic efforts with Harvey Fletcher as early as 1933.

Fantasia actually was a multichannel surround production (trade-named "Fantasound"). As part of that effort, there were three channels across the front, behind the screen. I speculate that this configuration set the stage, literally, for the cinema stereophony that was to follow in the 1950s.

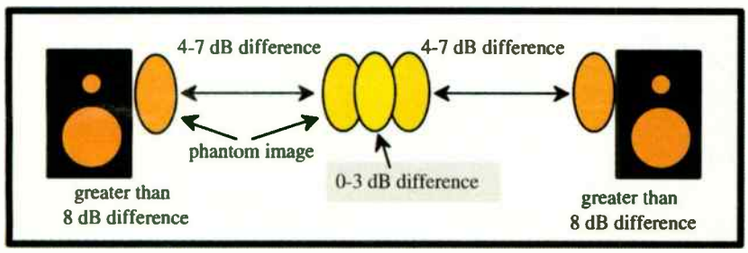
In that cinematic version of stereophony (the version intended for commercial movie theater release with Cinemascope, ToddAO, and Vistavision, among others), all dialogue was assigned to the center channel, to keep it "on-screen."

A two-channel version, which depends on phantom images, would have been defective for theater-goers other than those lucky few on the median plane. The left/right stereo was reserved for music and some reverb, ambience and FX. This convention has been carried forward, and is in broad use today.

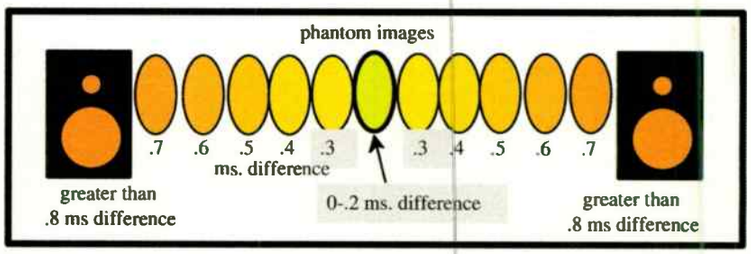
IN VIDEO

When we consider video production and transmission for viewing via home television in its various guises, we have to make provision for both phantom and solid images, because that transmission may be either multichannel or two-channel stereo Further, our beloved end-user's system may or may not have a center channel.

In the Dolby Pro Logic and related analog systems, where surround is derived from a two-channel signal, a steering mechanism is employed to derive the center channel signal, while suppressing all signals that exist only in left and/or right channels.



The left and right positions of phantom images as a function of amplitude differences between the left and right channels. Note that there is virtually no image shift for up to 3 dB difference between the channels. Note further that greater differences quickly cause the phantom to "migrate" to the louder channel.



The left and right positions of phantom images as a function of time differences between the left and right channels. Note that there is a fairly constant change in image shift for linear changes in time differences of tenths of a millisecond. Note further that by eight-tenths of a millisecond delay, the signal has fully migrated to the early speaker. This is equivalent to a listener moving his or her head only six inches off the median plane.

In discrete multichannel production, we tend to finesse the center channel by deriving both a solid and a phantom center, typically by sending 50 percent of the left/right mono summation to the center channel, so that both it and the left/right phantom are present, each 3 dB down. This works reasonably well.

IN MUSIC

The center channel is almost a nonstarter for multichannel music production. We have fairly strict and well-established, if informal, conventions for treatment of the phantom center image, and we have come to view the solid center channel as an aberration, except for SFX.

Some music mixers skip the center channel entirely, while others have learned to use it as one side of a three-channel stereo array that employs either left surround/left/center or center/right/right surround for a more spacious and compelling "side" signal.

In addition, music mixers will often use the same 50-percent trick that I mentioned above. At the other end of the range, some mixers send nothing but a little reverb to the center channel (to reassure listeners that the channel is working), for reasons that will become clear below.

IN THE HOME

Unfortunately, the center channel is the most wildly variable element in the 5.1 surround sound playback system. It almost never is an identical speaker and sometimes there is no speaker at all. Further, because it exists in approximately the same point in space as the television, it necessarily has to have different behavioral characteristics (make that deficiencies) when compared to more conventional full-range left and right speakers.

This is a major part of the reason it is approached with such caution by music mixers. We depend on the center image (phantom or solid) to carry the kick drum, bass and lead vocal, which can be thought of as THE most important elements in a pop music mix. To assign these to a presumably deficient speaker of unknown character and quality requires a large and unjustified leap of faith.

For home theater viewing, the situation is less dire. Dialogue usually requires less bandwidth and dynamic range than in music and FX, and even a somewhat marginal center channel can comparatively easily cope with these demands.

There is a final observation to be made here: the end-user cannot reasonably be expected to understand these concerns, or to optimize his/her system to fulfill these needs.

WHAT DOES IT MEAN?

The center channel for home video, multichannel music and home theater is a hand-me-down from commercial cinema practice that is still necessary but poorly implemented and often at odds with musical issues. It needs to be dealt with conservatively and carefully. Whatever you do, don't ask for too much from it!

Thanks for listening.

Dave Moulton wishes he was the center of attention, instead of being assigned to a surround channel. You can complain to him about anything at his Web site, www.moultonlabs.com.

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USER REPORT

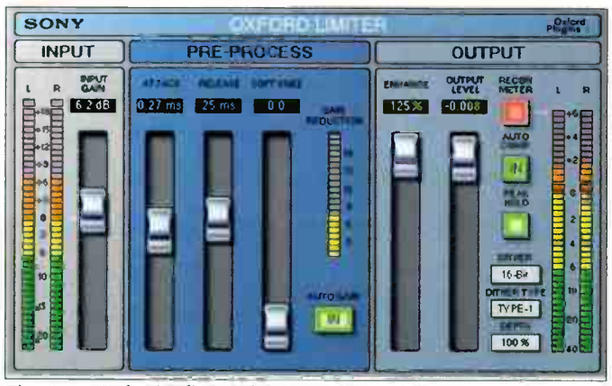
Sony Plug-ins Enhance TV Audio

by Rich Tozzoli
Mixing Engineer
Gizmo Production & Post

NEW YORK

At Gizmo Production & Post, we handle an array of programming, ranging from network promos to high-definition surround broadcasts and DVD-V concert videos. It's truly a team effort, with video editors in the HD nonlinear rooms passing shows on to the graphics department and, of course, off to the mixing engineers in the audio suites.

TV mixes often have to be delivered at a hard ceiling of -10 dB average program level with no peaks above -8 dB, to avoid colliding with the transmission compression schemes. We're always looking for new ways to push the audio levels of our shows as hot as they can go, while still sounding crisp and musical. There are several mixers in our audio "gang", and one thing we all have in common is the use of Sony Oxford plug-ins—especially the Inflator.



The Sony Oxford Inflator plug-in audio module

NO DISTORTION

I've been a fan of the Sony Oxford EQ and Dynamics for a while now, and I use each of them on virtually every audio mix I do. However, when it comes time to popping the levels up a few notches without distortion or artifacts, I turn to the Inflator. It can make programs punch through small speakers common in many TVs and still add warmth and presence.

Another important aspect of television and post mixing is working quickly. The Inflator is almost instinctive, in that you pop it onto your master fader (and/or channels), set your output level and push up your input level until you're rocking. You can use the effect and curve sliders to add some additional character (if needed) while viewing any changes on the meters. You can also choose direct or band split mode, although I tend to use the former most of the time. ■

Rich Tozzoli is an independent mixing engineer, specializing in multichannel audio production and mixing. The opinions expressed above are the author's alone. He may be reached at surroundpro@aol.com.

For more information contact Sony at 800-686-SONY or visit www.sony.com/professional.

USER REPORT

Riedel Artist-S Links Rotary

by Jamie Ransford
OSA International Staff Engineer

CHICAGO

OSA International is a full service sound and technical management company that specializes in corporate industrial shows, special events and entertainment. We have offices in five major U.S. cities and we're celebrating our 20th anniversary this year. We always pride ourselves on being on the leading edge of new technology, and that includes using the Riedel Artist intercom system.

I serve as the company's staff engineer and work on-site at events configuring audio and communications systems. Riedel is always our intercom of choice for larger events.

In late June, Production Plus, a turnkey staging company, hired us to provide a complete audio transport and communications system for an event at Chicago's McCormick Place, commemorating 100 years of Rotary International service. More than 40,000 business and professional leaders from 159 countries attended.

We designed, installed and operated a system with four Riedel Artist S frames, all linked with a redundant fiber loop. These matrices were modular, network-compatible platforms for transmission and distribution of analog and digital audio and data signals. We also used 12 RCP-1012E and four DCP-1016E Riedel control panels.

INTERFACES WELL

Because Riedel keypanels are able to interface with analog party lines from other manufacturers, the Artist S frames operated seamlessly with six ClearCom channels. We used ClearCom CCI-22s to convert two-wire to four-wire feeds going into the Artist-S. We also had 20 wireless communications drops that I was able to interface via the four-wire ports on the units.

We also interfaced two-way radios into the system. This enabled producers to have contact with not only the show crew, but also with staff members using radios, all via their keypanels.

The Riedel intercom control panel and software setup screen are shown here, ready for use at the Chicago Rotary International Convention.

Every time we use the Riedel system, there seems to be something unique or unusual required of it. For this event, the master of ceremonies was wearing an ear mic and an IFB (interruptible foldback). Because the room was so large, we folded his mic back into his IFB. He was also able to receive direction from the stage manager, who could access the IFB directly via a button on his panel. And because the mic was being fed pre-fade into the Riedel system, the stage manager received priority over the foldback. When the stage manager wanted to speak to the master of ceremonies, his own mic foldback level would duck down.

Whenever things change on site, a couple of mouse clicks is all it takes with the Riedel system. I can change audio patches and panel configurations, or give people access to anybody on the crew, all from my computer. ■

Jamie Ransford has served as staff engineer for OSA International since 1996. He can be reached at 630-227-1008 or audio@osacorp.com. *The opinions expressed are the author's alone.*

For further information contact Riedel at 818-563-4000 or visit www.riedel.net

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The **Solid State Logic** new-generation C100 is a small footprint, assignable digital audio broadcast console, specifically designed for on-air studio applications, such as news and sports and live-to-tape talk and game shows, where fast and efficient handling of sources and destinations are the most important aspects of the audio operator's role. The transition to digital broadcast is addressed by the C100 Digital Broadcast Console, which delivers high operational efficiency and is scalable. The C100's robustness provides the redundant capabilities necessary for live broadcast situations.

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

The **Yamaha** HS Series is a new two-way, internally powered speaker system designed to provide affordable, high-quality reference monitoring for television studios, edit rooms and other applications. The series consists of three cabinet models, the HS50M, the HS80M and the HS10W subwoofer. All are sold and packaged individually, making it easy to build flexible monitor and 5.1 setups. The 70 W HS50M (5-inch cone, 3/4-inch dome tweeter) and 120 W HS80M (8-inch cone, 1-inch dome tweeter) units are housed in bass reflex-type cabinets In addition to master level controls, each speaker has trim switches that allow frequency response to be custom-tailored.

The HS10W powered subwoofer features a long-stroke, 8-inch 120 W woofer and bass reflex design cabinet. Controls include master level, phase and low/high cutoff frequency. All enclosures are constructed of high-quality MDF material, with a multiple layer finish to minimize resonance. Full magnetic shielding is provided.

For more information, contact Yamaha Corp. of America, Pro Audio & Combo Division, Music Production, at 714-522-9011 or visit www.yamaha.com.

The HSP series is a new line of headset mics from **Sennheiser Electronic Corp.** The HSP2 (omni) and the HSP4 (cardioid) headsets feature integrated windscreens and are designed for all professional broadcast, theater and touring applications. This new headset line is unobtrusive, yet rugged and lightweight.

The HSP headset line is engineered for optimum performance and includes an ergonomic 1.1mm diameter mic boom, which is fully adjustable and mountable on either side of the headset. Both headsets are fully compatible with the new Sennheiser MZA900P inline preamp.

The HSP2 headset is outfitted with the MKE omnidirectional capsule for optimized treble and bass response, and it handles sound pressure levels of up to 142 dB. The hermetically sealed capsule and "umbrella" diaphragm protect against moisture.

The cardioid HSP4 headset uses a newly designed cardioid version of the MKE capsule. This capsule is designed to deliver greater isolation in acoustically demanding live performance environments where background noise and feedback are prevalent. The HSP4 features a flexible gooseneck for optimal positioning.

For more information, contact Sennheiser Electronic Corp. at 860-434-9190 or visit www.sennheiserusa.com.

USER REPORT

Audio Complaints End With Dolby

by Deepak Jolly
Headend and VOD Engineer
BendBroadband

BEND, ORE.

At BendBroadband, I am pleased to report that we have not received a single subscriber complaint about audio levels in the past year. Like many MSOs, we used to receive several a week.

The difference is that we installed a Dolby LM100 Broadcast Loudness Meter in our facility. We use it to normalize the subjective dialogue level of all incoming sources before sending the programming on to our subscribers. As our cable subscribers switch from channel to channel, the subjective loudness remains constant. They no longer have to readjust the volume all the time and there are no more sudden blasts from commercials.

Deepak Jolly, headend and VOD engineer for BendBroadband CATV

As headend and VOD engineer, I had very little control over volume levels. They varied widely from program to program. I had to send out the signal that came into our system. I knew there was a better way. I started searching—literally worldwide—to find equipment that would measure audio, reflecting what people actually heard, and addressing our customer complaints. My efforts seemed fruitless until a colleague at Megahertz in Denver put me in touch with Jeff Riedmiller of Dolby Laboratories in San Francisco. Jeff had a new product—the LM100. He arranged for me to try out one of the first units and the rest is history.

SATISFACTION ACHIEVED

I collected all the data needed to normalize my incoming sources to what I call the "sweet point." By displaying the dialogue-based loudness of a source as a simple number, the LM100 made it possible to find the right audio levels for all programming. The result has been a level of subscriber satisfaction that my company could not have otherwise achieved.

We are now getting ready for more and more content for digital simulcasts. I know the LM100 will be invaluable in this effort. It makes it much easier to insert local advertising and to establish a consistent dialnorm level on the outgoing Dolby Digital audio. The dialnorm metadata in the audio is read by the Dolby Digital decoder in the subscriber's set-top box to provide a consistent listening experience.

Overall, I am very enthusiastic about the Dolby LM100 Broadcast Loudness Meter. My company is also enthusiastic about Dolby recommending realistic loudness standards. With the LM100 as the measuring tool, we have industry standards that were not possible before. Because Dolby licenses Dolby Digital technology to all set-top box manufacturers, they can keep broadcasters informed of what to expect in the way of incoming signals, and they can also keep manufacturers informed of what broadcasters are putting out. ■

Deepak Jolly is Headend and VOD Engineer for BendBroadband, a privately owned cable operation serving Central Oregon since 1955. He may be contacted at 514-388-5815. The opinions expressed above are the author's alone.

For more information, contact Dolby-Laboratories Inc. at 415-645-5000 or visit www.dolby.com.

BUYERS BRIEFS

The **Audio-Technica** AT892 MicroSet is an omnidirectional condenser headworn microphone, combining high audio quality with minimal visibility. It is designed for broadcasting and other applications requiring high quality coupled with a small physical profile. The mic features a condenser capsule with a diameter of only 2.5 millimeters.

The AT892 Microset hooks behind the talent's ear and is claimed to stay in place on even highly animated performers. It is very lightweight and will not interfere with users' eyeglasses.

The AT982 Microset is available in either nonreflective black or beige finishes. The unit may be purchased with a choice of output connectors to allow it to work with the Audio-Technica wireless system or that of any of several other manufacturers.

The AT982 Microset package includes two windscreens, two element covers, a cable clip and a carrying case.

For more information, contact Audio-Technica at 330-686-2600 or visit www.audio-technica.com.

The AVA 22D from **Rane Corp.** is a two-channel, fully balanced A/V delay alignment tool designed for broadcast television use as well as other applications requiring audio delay. The AVA 22D offers a delay of up to nine-and-a-half television frames in either 525- or 625-line systems and features 24-bit audio processing.

Audio time shifts are available in single field (one-half frame) increments. Nonvolatile memories store the user's delay settings in the event of a power failure. Bypass relays allow audio signals to pass through the AVA 22D should power be interrupted. Rear-panel connections are provided for remotely recalling memory settings. The unit also includes a recessed real-panel switch for locking out most front-panel control functions if desired. XLR connectors are used for audio I/O.

The AVA 22D features "Signal Present" and "Clip" LEDs to indicate audio input status. The unit may be operated either a discrete channel mode, with independent adjustment of either channel, or in stereo mode, with a single adjustment for both channels.

For more information contact Rane at 425-355-6000 or visit www.rane.com.

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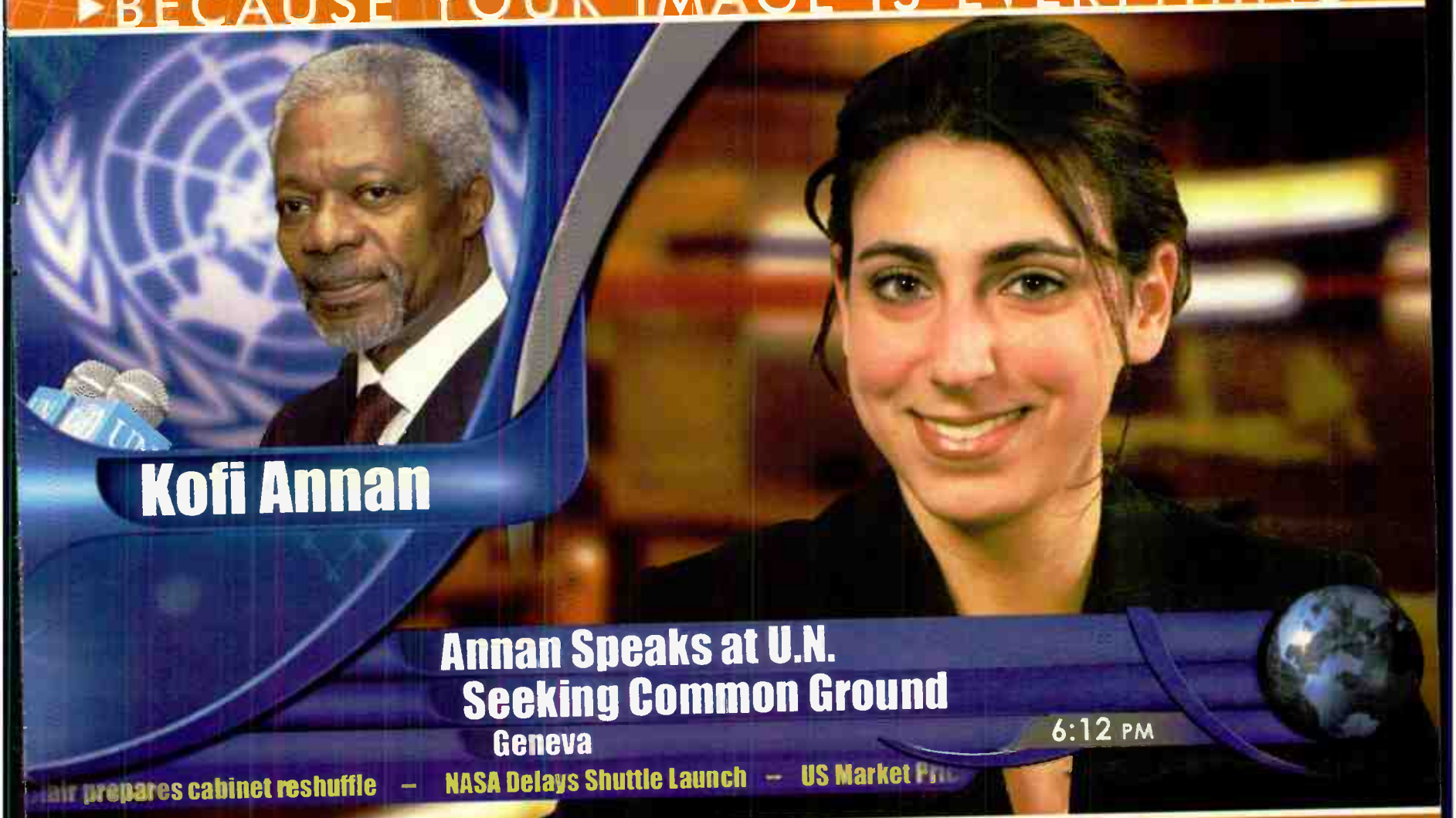

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Quality - Inca broadcast graphics products are of the highest quality, allowing operators unparalleled creative freedom and providing graphic artists with the tools to create the most visually appealing graphics imaginable.

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Scalability - Our Inca family of broadcast graphics products bridges SD and HD technologies, allowing broadcasters to upgrade to local HD production at their own pace using HD/SD simulcast; HD upgradeable graphics products; or HD/SD selectable graphics solutions.

For more information on Inca products visit www.leitch.com/inscriber

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USER REPORT

CTV Selects Ward-Beck

by Allan Morris
Senior Vice President of Engineering and Operations
CTV Television Network

TORONTO

CTV, Canada's No. 1 private broadcaster, is part of Bell Globemedia, a multimedia company that also includes The Globe and Mail, the leading daily national newspaper. With the constantly evolving nature of television broadcasting, there is always the need for rapid implementation of new services to keep the broadcast division on the leading edge. CTV currently delivers SD and HD broadcasts over the air and via cable and satellite services.

Canada's CTV is using the new Ward-Beck AMS8-1 and AMS8-2, shown above.

Multichannel audio for surround sound in discrete AES, Dolby E and AC-3 signal formats is becoming more prevalent within the CTV plant and network. There is a need to monitor these signals for confidence and quality, preferably within a single unit. Since space is always at a premium, the ideal unit would take up only one or two rack spaces.

Manufacturers of monitoring gear are all working to introduce products for multichannel audio monitoring. It was to our advantage to choose Ward-Beck Systems to provide the monitoring systems for us.

They were in the stage of developing the AMS8 monitoring series and were open to implementing ideas that would address our particular needs. We have used their audio components before and have worked with them in the past to adapt some of their products to provide us with unique solutions. We were confident that they would do so again.

MULTIFORMAT MONITOR

We are now using the AMS8-1 and AMS8-2 in master control and have been pleased with the performance of these products. The ability to extract embedded audio signals, and to monitor AES discrete, as well as Dolby-E and AC-3, within the same 1RU box is a great advantage.

Furthermore, the Ward-Beck design engineers are working hand in hand with our team to modify the operational characteristics of these units as our requirements evolve. The programmability of the AMS8 series monitors means that our needs can be addressed quickly. ■

Allan Morris is senior vice president of engineering and operations for CTV Television Inc. He is based in Toronto and may be reached at 416-332-6332. His e-mail address is amorris@ctv.ca. The opinions expressed above are his own.

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

USER REPORT

WWE Taps Fairlight

by Chris Argento
Director of Audio Post-Production
World Wrestling Entertainment

STAMFORD, CONN.

The World Wrestling Entertainment network knows all about crunches, particularly time crunches. The sheer volume of original content we produce every week demands maximum efficiency in our production studios. For the audio post-production department, no component has streamlined our workflow as much as the Fairlight QDC digital audio workstation engine coupled with our newly added Fairlight Pyxis nonlinear video recording/playback system.

We produce nine hours of original content weekly. In addition, our department produces a full-length DVD/VHS monthly, 10 weekly promos and dozens of radio spots annually for our 16 pay-per-view events. Our content is broadcast in more than 100 countries. The audio post-production department is always in high gear. Key to our output is the speed and efficiency of the Fairlight platform.

WORKFLOW INCREASED

Our WWE facilities in Stamford, Conn. feature two identical audio suites, each using a Fairlight digital audio workstation powered by the QDC engine. The intuitive control surface combined with Fairlight's processing speed have increased our workflow 75 percent, enabling us to handle more projects.

The addition of the Fairlight Pyxis has further increased production speed by streamlining load-in time and video sync tasks. We bring video directly into Pyxis from our video-editing department, from either Final Cut or News Edit. With Pyxis' full support of 9-pin synchronization, we are able to make lighting fast enhancements and revisions. We can also produce multiple audio versions for the same video clip without reloading audio each time. This allows us to greatly increase production speed for promos and radio spots. When finished, we can output a project in QuickTime for fast and easy review via e-mail or online postings.

Pyxis also improves synchronization with our video department. If a project undergoes video revisions before we finish the audio, we can apply the video cuts or shifts to the Pyxis rather than wait for revised pictures. If the producer says, "We are losing that shot and taking out time," I can edit right on the Pyxis and continue to work.

In my 10 years with the WWE, I've seen workloads increase steadily as the company expands its broadcast presence and worldwide reach. All the while, audio has become integral to enhancing each match, scene and promo. The Fairlight solution has enabled us to increase our throughput without compromises.■

Chris Argento is director of audio post production for WWE in Stamford, Conn. The opinions expressed above are those of the author alone. He may be contacted at chris.argento@wwecorp.com.

For more information, contact Fairlight at 323-460-6857, or visit www.fairlightau.com.

COMPANY PROFILE

Euphonix: Focused On High Quality

by James E. O'Neal

PALO ALTO, CALIF.

Since its inception in 1988 Euphonix has grown to become a leading manufacturer of large format digital audio consoles, multitrack digital recorders, integrated digital audio workstation control surfaces and audio peripheral devices.

The company's focus from the very beginning has been on digitally controlled audio consoles. That emphasis has not changed over the past 17 years. The first Euphonix product was the CS Series of digitally controlled analog consoles which found wide acceptance within the industry, with over 500 units installed.

The Euphonix premier all-digital product was the System 5, introduced in 1999. It was the world's first 24 bit/96 KHz large format console and remains a big seller, with over 200 in use. System 5 models are tailored for film and TV dubbing, as well as for on-air and live-to-tape applications. The System 5 line also includes a large digital audio router that can be integrated with broadcast facility routers, and also multi-channel digital audio converters.

The Max Air is the latest entry into the Euphonix broadcast product line. It features a more compact and cost-effective control surface and is specifically tailored

to the requirements of TV broadcasters.

Euphonix markets console products to all sectors of the professional audio market—broadcasters, the film industry, post-production houses and live performance venues. The Euphonix list of customers includes CNN, NBC, the UK's Pinewood Sherpperton Studios, Skywalker Ranch, the Sydney Opera House

Andrew Wild, vice president, marketing for Euphonix

and the Grand Ole Opry.

Euphonix has not limited itself to console design and production. The company markets a digital multitrack audio recorder and produces digital audio format convertors and signal processors, all designed to integrate with the company's digital console product line. With the 1996 purchase of Seattle-based digital audio workstation manufacturer Spectral, Euphonix has emphasized its development of control applications, with the goal of full control of video and audio software applications from Euphonix product control surfaces.

Andrew Wild, Euphonix VP of marketing, explained the current market focus, "Our expertise is in digitally controlled audio mixing systems. The broadcast and audio post industries have embraced digital technology and are both healthy sectors of the pro audio industry, so we have put all our resources into these areas in recent years. Our strong clients list, including some of the top facilities in the world, bear this out."

Wild commented on the new direction that Euphonix is taking with respect to software application control.

"The music and post markets are now almost exclusively using DAWs, so we decided that we needed to integrate our control surfaces with these software applications, hence the design and recent introduction of the System 5-MC and MC controllers. The move to working in a software application environment has revolutionized pro audio, but also reduced a lot of operations to keyboard and mouse. The System 5-MC and MC give the operator the ability to work with a keyboard, but also provide a control surface with knobs, faders and programmable switches to speed up operation and to handle the complexities of mixing hundreds of tracks."

Martin Kloiber, chairman of the board and chief technology officer, explained another aspect of the company's strategy. "At one time it was possible for a company to work on its own. However with the introduction of networking, it is now possible for products to communicate with each other and for different companies to work together to provide integrated products to enhance workflow. Once you can connect different products together you need to have very good personal and working relationships between companies and have open protocols to allow integration. We have been working very hard with several leading audio companies to make sure that our products can talk to each other, providing solutions that would not be possible from a single company, the System 5-MC and MC are examples of this new philosopy."

The Euphonix main production facility is located in Palo Alto, Calif. The company has sales offices in Los Angeles, Nashville, New York City, London and Tokyo.■

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www.euphonix.com

USER REPORT

'Scrubs' Gets Lectrosonics Treatment

by Joe Foglia, CAS
Owner
Southeast Audio Services

WINDERMERE, FLA.

Since starting "Scrubs" in 1999, I've had a unique challenge. We don't shoot the show on a stage; we shoot it in a very large, abandoned hospital in North Hollywood, Calif. Because of low ceiling height and fire door headers everywhere, we are prevented from using a boom.

I called the engineering department at Lectrosonics and explained my situation. We came up with a great solution. We placed antennas overhead throughout the hospital and ran low-loss Lectrosonics RG-6 cable because of the long runs. We also used a Lectrosonics amplifier system for the signals from the SNA-600 dipole antennas. All outputs went to a combiner. Its output ran to one side of our wireless system. On the system's "B" side, we used a shark fin directional antenna. We have absolutely no dropouts.

MORE IN LESS SPACE

Last year, we added the new Lectrosonics Venue system. It's become a really helpful tool. Not only is it a space saver—1 RU high—but it runs on 12 volts and offers six channels versus the four we used to have. Having two more channels of wireless in a smaller amount space is great. The fact that the Venue system works with older transmitters is also nice.

The Lectrosonics Venue line, including the SM transmitter, was used in the production of "Scrubs."

The Venue software is phenomenal. We can walk our path of shooting, and using a laptop, see any dropout or low-signal problems beforehand, so we can adjust for it and increase signal range.

This year, we purchased the new SM super-miniature transmitters. Today, actresses' skimpier outfits require smaller transmitters. But with correct antenna placement, I never have a problem. And since the SM is super-small, you can place it anywhere on the body.

On "Scrubs," we have huge walk-and-talk scenes. For those applications, I use Sanken and Lectrosonics gear in the best possible combination: I thread the Sanken through a stethoscope down to the diaphragm. We call them "stethomics." As a result, we never get clothes rustle and always have great frequency response.

Lectrosonics has done a really good job of keeping up with technological innovation, but they do it at a comfortable pace and an affordable price. That's great for independent production mixers who aren't companies purchasing dozens of systems at one time. ■

Joe Foglia is the founder and owner of Southeast Audio Services in Windermere, Fla. The company has provided support for film, television, and commercial industries for more than 20 years. He may be contacted at southeastaudio@earthlink.net.

For more information, contact Lectrosonics at 505-892-4501 or visit www.lectrosonics.com

BUYERS BRIEFS

The FP33 is a three input/two output portable stereo mixer from **Shure**, specifically designed for ENG, EFP and location film applications. The unit features sealed input potentiometers, a link switch to couple two of the inputs into a stereo pair, and a low-battery warning indicator.

Very low internal noise and a dynamic range in excess of 100 dB make the FP33 suitable for DAT and other digital recording media.

The unit provides both 12 and 48 V phantom power sources and its mix bus can be connected to that of another FP33 or Shure FP32A. Also, by using an accessory cable, the unit can be linked to the Shure FP24 mixer to create a portable 5-by-2 audio production system.

The FP33 also allows the user to create more than 4,000 customized setups via internal DIP switch settings.

Pop-up type panpots are provided, and the mixer features a matrix headphone switch that allows the user to monitor in stereo, summed left and right channels, or full left/full right channel modes.

In addition to analog metering, the FP33 provides the user with LED indication of input levels, output peaks, limiter action and low batterty. The mixer may be powered from two internal 9 V batteries or from an external source providing 12 to 30 V DC.

For more information contact Shure at 847-600-2000 or visit www.shure.com.

The **Sound Devices** model 744T is a new portable digital multitrack audio recorder, well suited for reality style television field production work. The 744T is about the size of a VHS tape box and weighs in at 2 1/2 pounds.

It features four channels of digital audio recording on an internal 40 GB hard drive. If desired, the unit can simultaneously record to Compact Flash memory. The recorder accepts either mic or line level analog inputs, as well as digital inputs. It outputs both analog and digital signals.

Peak limiting, adjustable high-pass filtering and 48 V phantom power are available when using mic inputs. The unit can serve as a master clock or be slaved from external time code devices.

The 744T records in uncompressed Broadcast Wave file format at 16 or 24 bit resolution, with sampling rate selectable up to 192 KHz. Dynamic range is 114 dB.

Power for the 744T is provided by removable lithium ion cells. An input is provided for both externally powering the recorder and charging the onboard battery.

For more information contact Sound Designs at 800-505-0625 or visit www.sounddevices.com.

INTRODUCING

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USER REPORT

Zaxcom Digital Wireless Mics Deliver

by William Sarokin
Independent Motion Picture and TV Sound Mixer

NEW YORK

The use of radio mics has grown more and more essential in film and TV production work since the early 1990s. The use of multiple cameras, Steadicams, improvised dialogue and live recording on extremely noisy locations have all required that the mixer carry, and know how to use, reliable radio mics. Not too long ago, one or two VHF nondiversity radios were considered adequate. Nowadays, six to 10 UHF diversity radios are the minimum. To further complicate matters, the introduction of digital broadcast TV, cell phones, and Wi-Fi have greatly reduced, if not eliminated, the RF spectrum needed for these radios.

Existing wireless manufacturers have done a good job of stretching analog technology to its limits, but as spectrum disappeared in major markets, the limits of that technology became apparent. Something new was needed and Zaxcom filled the gap. I already owned Zaxcom digital recorders and a digital mixer, so when the company announced it was developing fully digital radio microphones, I was extremely interested.

William Sarokin is shown here on location with Zaxcom digital wireless mics.

DIGITAL BENEFITS

Digital radios offer benefits over existing analog-based radios, including hybrid radios, which use analog transmission. Digital transmission allows for error correction, which can totally eliminate interference and noise in the signal. It's also immune to intermodulation interference, so more radios can be used in a frequency block. Gone, too, are the audio artifacts found in analog radios caused by the companding required to fit a high-quality audio signal into a small bandwith radio signal. The audio quality of the Zaxcom digital radios is outstanding and error free. If I hear any noise in the audio chain, I know it is not from a Zaxcom radio, but somewhere else in the chain. It's a great feeling of security to know that the digital signal is error-free 100 percent of the time.

While the Zaxcom radios alleviate the problems caused by loss of spectrum, they do not eliminate it. Even high-quality radios putting out 50 to 100 mW cannot compete with a megawatt TV station on the same frequency. The next-generation Zaxcom radios, due out in this fall, will have a sure-fire solution. Each radio will include a mini SD card and recording technology with timecode. So each radio will, in effect, be a miniature recorder worn by the talent. If the radio transmission should be lost—no worries. Just pop the mini SD card into a docking station and download the saved audio after the scene is over. ■

William Sarokin is a New York-based sound mixer whose credits include Spike Lee's, "Inside Man" with Denzel Washington, Jodie Foster and Clive Owen; the soon-to-be released "North Country" with Charlize Theron, Woody Harrelson and Frances McDormand; the pilot of the FX hit series "Rescue Me;" and the first season of "Sex and the City," among others. He may be contacted at bigmaho@verizon.net.

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

USER REPORT

Calrec Handles TV Azteca Audio

by Eusebio González
Audio Manager
TV Azteca

MEXICO CITY

TV Azteca is used to taking risks. Our first big gamble was when TV Azteca started up in 1993. Around this time, the Mexican television market was already monopolized and TV Azteca was starting out as a brand new commercial station.

The gamble paid off. TV Azteca is now the second largest producer of Spanish-language television in the world, operating two national television networks, Azteca 13 and Azteca 7, with 315 owned and operated stations across Mexico.

When we sat down to design a brand new HD ENG truck based in Mexico City, we wanted to ensure that it was as good as it could be—the truck would be used for HD live broadcasts, HD production and a variety of special event broadcasts. When it came to the audio board, we weren't afraid to take another leap of faith in order to get the right one for the job.

In Mexico, broadcasters do not use purpose-designed audio consoles in their facilities. All the audio desks are designed for music, film or live sound and are adapted for use in broadcasting. With the truck, TV Azteca wanted to provide the most professional service in Mexico. In order to do so, we needed to install professional equipment designed for the job.

CALREC ZETA SELECTED

After a thorough evaluation of all the consoles on the market, we chose the Calrec Zeta. It offered the most complete feature set of any console and at the same time allowed great flexibility of use and configuration during live broadcast events. It has a huge number of input sources and a variety of audio output stages.

The desk is configured with 24 mono and 32 stereo channels across 32 faders. All have full processing and routing capabilities, as well as local desk inputs and outputs. This gives us more than enough processing power. We were given an extensive overview of the console's operation during acceptance at the Calrec factory in the United Kingdom. However, the desk design is very intuitive and our operators have found it very easy to use.

Eusebio Gonzalez with the new TV Azteca Calrec Zeta.

The Zeta provides a level of quality and commitment, enabling us to focus all our skills, enthusiasm, innovation and energy in doing what we do best at TV Azteca—entertain our audience and offer different and attractive programming.

The installation was a double record-breaker. Not only was it the first Calrec in Latin America, but also the first dedicated, purpose-designed broadcast console in Mexico.

Using the correct equipment is a worthwhile investment. ■

Eusebio González is TV Azteca's audio manager. The opinions expressed above are those of the author alone. He may be contacted at egonzale@tvazteca.com.mx

For more information contact Calrec at 212-586-7376 or visit www.calrec.com.

BUYERS BRIEFS

The DM-3200 is a new 32-channel digital mixing console from **Tascam**, designed for use with a DAW in recording or post applications. The device features XLR inputs for 16 mic or line level analog sources and an additional 16 TRS balanced inputs. Sixteen auxiliary returns are provided, which increase the DM-3200 input capacity to 48. Phantom power is available on all of the 16 mic channels. Additional inputs are provided for AES/EBU sources. An optional expansion card allows the user to interface with a computer via FireWire and also offers virtual MIDI ports. A USB port and 1/4-inch footswitch jack are provided for user applications. An internal display provides timecode, external transport and metering information.

The console offers both AES/EBU and analog outputs available via a mix of XLR, RCA and TRS connectors. RS-422 ports are provided for GPI and external device control. Built-in DAW and transport controls are also part of the console's feature set. Motorized faders are provided for automation.

The DM-3200 offers 24-bit digital resolution at its full 96 KHz sampling rate. Equalization and compression are provided on each of the console's channels.

The manufacturer also offers a number of additional user options, including both analog and digital input expansion, a 24-channel metering bridge, TDIF expansion and surround monitoring.

For more information contact Tascam at 323-726-0303 or visit www.tascam.com.

The D-9 digital television audio console by **Wheatstone** is designed for medium to major market stations. The product provides mix-minus clean feeds, individual channel "Bus-minus" outputs and 5.1 surround sound.

Multiple consoles within a broadcast facility may be networked together via the company's Bridge digital audio router. With this configuration, mixes can be sent to any destination at will and all plant input signals are available at any console.

The D-9 console is available with a variety of I/O options. These include 110 ohm balanced DB connectors, CAT-5 110 ohm audio, as well as 75 ohm BNC connections. Cage-to-cage network connectivity is possible via either CAT-5 or optical fiber linkage.

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

Loud Technologies, parent group of **Mackie**, is offering a new line of internally-powered desktop monitor speakers carrying the company's Tapco brand. These Mackie-designed units are for broadcast, recording, and post production. The S5 (5.25-inch woofer) and S8 (8-inch woofer) monitors feature user-adjustable controls for low frequency boost and high frequency boost/cut, allowing tailoring to compensate for differing room acoustics. Both the S5 and S8 offer input connections via balanced TRS and XLR connections. They also accept unbalanced audio via standard RCA jacks. The speakers are magnetically shielded, allowing placement adjacent to CRT monitors.

For more information, contact Loud Technologies at 466-858-5832 or visit www.loudtechinc.com.

USER REPORT

Time Delay.tv Chooses Wohler

by Darryl Rose
Managing Director
Time Delay.tv

LONDON

I have worked on numerous live programs, including ABC's "Good Morning America," tennis on ESPN and NBC as well as boxing on HBO. I also just won an Emmy for NBC's coverage of the Athens Olympics last year.

I have to work under pressure in live TV situations, and my background in live editing for sports and reality shows led me to set up Time Delay.tv, Europe's only company dedicated to broadcast censorship, profanity eradication and time shifting.

I needed reliable and professional audio and video products to take away in a flyaway kit, and I am so pleased that I chose Wohler and Panorama products.

My flyaway kit needed the best LCD monitors with audio monitoring units, since I need to see and hear live and delayed outputs from the TV shows I work on.

I chose Panorama RM-3270W 16:9 7-inch LCD monitors, for their quality, reliability and viewing angles. These LCD monitors are compact and convenient. The viewing angles are literally the best I've seen. They are extremely light (less than 6 pounds) but sturdy enough to be racked and flown all over the world.

Wohler audio monitors are the industry de-facto standard. I do like the large range that Wohler offers, but to be honest, it can be confusing when navigating around the entire product offering. I eventually decided on the AMP1A-LP2S, as I needed two stereo inputs, and to be able to quickly switch between live and delayed feeds.

GLOBETROTTING

My flyaway gear has traveled to Fiji for "Celebrity Love Island," and to Australia for "I'm A Celebrity, Get Me Out Of Here!" for Granada Television.

I chose Wohler and Panorama because of the excellent reputation they have in the broadcast industry. The Wohler product line is versatile, multifunctional and rugged enough for use in flight packs and outside broadcast environments, all vital in regards to my line of operation.

I am really looking forward to making the move to HD and placing my order for the new Wohler MON2-3W/HR high-resolution HD-SDI and SDI video monitor and one of their AMP-S8MDA audio monitors.

The S8MDA unit will offer me the versatility of de-embedding audio from HD and SD-SDI, converting and outputting multiple formats as required. These units offer me the flexibility I require while out on location. In my line of business, I am never certain what format source I am going to have thrown at me, but at least now, thanks to Wohler, I will be well prepared! ■

Darryl Rose, managing director of TimeDelay.tv

Darryl Rose is the managing director of TimeDelay.tv and can be reached at Darryl@TimeDelay.tv.

For more information on Wohler and Panorama products call 615-589-5676 or visit www.wohler.com.

BUYERS BRIEFS

The 200UPR from **Azden Corp.** is a dual channel UHF receiver designed to be used with wireless mics and beltpack transmitters. The unit provides two discreet audio channel outputs and mounts directly atop the camera. The 200UPR is designed to be compatible with Azden series 10, 41, and 51 transmitters. It tunes a total of 63 RF channels in the 794 to 806 MHz frequency band and can simultaneously receive signals from two transmitters or wireless mics, thus making available two independent audio outputs. These are provided at mic level for direct connection to camera inputs.

Antennas mount directly on the 200UPR via BNC connectors. The receiver package includes twin high-gain antennas, audio cable sets with connectors for both conventional and DV cameras and a shoe-mount for attaching the receiver to the camera The unit is powered independently of the camera by its own internal "AA" batteries which typically provide more than eight hours of service.

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

AMS Neve has introduced a new product, the CineFile multitrack dubber/recorder. The unit is designed to interface with the company's DFC Gemini line of post production audio consoles, but standalone operation is also supported. The CineFile and DFC Gemini combine to provide a versatile and expandable platform for post production applications requiring a large number of audio tracks.

When the DFC Gemini is interfaced with CineFile technology, up to 384 discrete tracks can be stored and manipulated. Punch in/out, real-time crossfades, high- speed scrub and forwards/backwards playback operations are all available to the user. Depending upon sampling rate, each CineFile device can provide up to 96 tracks. Units are daisy-chained together as additional recording tracks are required. The CineFile device accommodates local removable, SCSI, FireWire or networked storage. It supports AAF, AudioFile, or Pro Tools Session 5 native recording formats.

For more information contact AMS Neve at 212-965-1400 or visit www.ams-neve.com.

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BUYERS BRIEFS

The **Studio Technologies** Model 740 Audio Mixer is targeted for use in ENG vehicles. The unit is supplied in a steel enclosure with internal power supply and occupies a single 1.75-inch rack space. The 740 features six mic/line inputs, a monaural output bus, 10-segment LED meter and flexible monitor section. All controls and indicators are located on the front panel; the operator never has to access the back panel.

Internal configuration jumpers allow performance to be optimized for each specific installation. All of the 740's components were carefully selected to deliver low-noise, low-distortion and high-headroom performance. The unit also features a studio quality compressor and an internal setup oscillator with a dedicated output.

For more information, contact Studio Technologies Inc. at 847-749-7266 or visit www.studio-tech.com.

The new **Harrison by GLW** Trion flexible console system features a traditional surface architecture, eliminating the need for a central, shared-knobs control panel.

Controls and assignments for each channel are fully accessible as traditional, vertically arranged strips or, in an enhanced version, expanded across eight channels for an intuitive, knob-per-function control, anywhere on the console.

This feature, together with dynamic profiling (calling any channel or set of channels to any fader strip or set of fader strips), allows a single Trion to share and support remote control panels in applications where distributed control is desired.

A monitoring center section is available on the Trion for music and broadcast applications; it provides a dedicated source selection section to main 5.1 speaker feeds, near-field feeds and four studio/cue feeds.

Four main program output faders are provided with this center section, providing master fader control of four stereo outputs or, in the 5.1 mode, a 5.1 output and a separate stereo output at the same time.

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

The **Orban** OPTIMOD?TV 8382 is a new programmable audio processor designed especially for television broadcast applications. The model 8382 replaces Orban's previous television audio processors, the models 8182 and 8282. The new unit is intended for FM aural transmission purposes using either 50 or 75µs pre-emphasis. The 8382 processor is packaged in a 2 RU enclosure and offers more features than the older model 8282 at less cost. Utilizing digital processing technology, the new 8382 addresses mono, stereo and dual language analog television audio processing requirements and is compatable with BTSC, NICAM, EIAJ and IEC dual carrier standards.

The 8382 processor is equiped with both analog and AES3 inputs and outputs as standard equipment. It can accept and output sample rates between 32 and 96 KHz. The unit is remotely controllable via eight GPI ports or may also be controlled via an internal clock-based automation system. In this mode of operation, the user can program the 8382 to change presets and operating modes at predetermined times during the broadcast day. The internal clock can be synchronized either to a house clock system or to NIST-based time reference sources via the Internet.

For more information contact Orban/CRL Systems at 480-403-8300 or visit www.orban.com or www.crlsystems.com.

IN-DEPTH WITH HDV

What is HDV?

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

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TV Technology's Equipment Exchange provides a FREE listing service for all broadcast and pro-video end users. Brokers, dealers, manufacturers and other organizations who sell used equipment on an occasional basis can participate in the Equipment Exchange on a PAID basis. All free listings run at the discretion of the publisher. Call 1-703-998-7600 for details. Submit your free listings on your letterhead and state the make, model number, a brief description, sale price and complete contact information and mail it to: TV Technology, PO Box 1214, Falls Church VA 22041

ANTENNAS/ TOWERS/CABLES

AUDIO PRODUCTION

Want to Sell

Mackie 1604 VLZ Pro, new, too low to quote; Mackie 1604 VLZ, used, $625; Sony MXP-744, BO; Bittree & ADC audio & video patch panels from $300; Stantron 45RU racks from $450; Emcor Series 10 40RU racks from $400; Digidesign 888, $650; Sony PCM7040 DAT, $3990; Crown D75 & D150 amps, low $$; DPS stereo audio sync, $1000; Panasonic SV-3700 DAT, $250; Panasonic SV-3800 DAT, $400; Alesis M1 active speakers, $295/pair; HHB Circle 5A studio monitors, pair, $950; Wohler Amp 1-A, $425; Wohler AMP-1A-VTR+, $550; Wohler AMP-1AP, $450; Wohler AMP-1APF, $450; Whler AMP-1APS, $450; Neumann U87 Ai studio mic, $1795; AKG C 414 B ULS mic, $1250. 818-788-4700 or www.tvprogear.com.

CAMERAS

Want to Sell

Sony BVW-300A, $4800; Sony DXC537A w/PVV1A SP Betacam, $3300/BO; (3) Panasonic D700 DVCPro, $4500/ea; Sony Betacam camera, $1500. 817-891-8080.

Sony BVW400A Betacam SP camcorder, $3995. 818-788-4700 or www.tvprogear.com.

Sony DXC-637 w/BVV5 Beta back & Hi8 EVV9000 back, full setup, good lens, $5000 or will trade for or into loaded Mac laptop/desktop dual G5. Bruce, 406-542-2595 or bbbacres@bresnan.net.

CAMERA ACCESSORIES

Want to Sell

Cartoni Beta head & single stage sticks, $1850; Sachtler Vario-Ped 2-75, $12500. 818-788-4700 or www.tvprogear.com.

CSR/Daiwa tripod w/TD35 titanium legs, ENG 30, hi-end head, beautiful fluid motion, for hi-end work, brand new cond, $4000 or will trade for or into loaded Mac laptop/desktop dual G5. Bruce, 406-542-2595 or bbbacres@bresnan.net.

CAMERA ACCESSORIES Con't

CAREERS

EDITING EQUIPMENT

Want to Sell

Avid Adrenaline, new, $21500; Avid Symphony version 3.5 on IBM Intellistation, $15500. 818-788-4700 or www.tvprogear.com.

LENS REPAIRS

Focus Optics. Service and repair of broadcast video lens. Fujinon, Canon, Nikon, Angenieux, etc. **We have the fastest turnaround in the country.** We also repair lens that have bad inpact damage. **Call Stuart at 800-234-lens or www.focusoptics.com.**

MICROWAVE/STL

Want to Sell

M/A-COM 2 GHz, 7 GHz, 13 GHz and 23 GHz, broadcast-quality radios in-stock. Excellent for STLs. Refurbished, repaired, retuned, tested and warranted. Save thousands of dollars over new radios. Antennas and waveguide also available. 100% Customer satisfaction. Massachusetts Microwave (978) 635-1556. www.massmicrowave.com.

MISCELLANEOUS

Want to Sell

Chyron INFINIT 040 processor, $3500; Sony BVE-600 editor w/SEG option, $600; Sachtler 14 tripod, $1250, Grass Valley 100 SEG w/border, serial, regen, $1800/BO. 817-891-8080.

Want to Buy

Want to buy Terrayon Cherry Pickers Model 7000. 800-829-5330.

MONITORS

Want to Sell

Sony PVM20L5, B-Stock, $2895; Sony PVM-20M4U, $1750; Sony PVM14L5/2, new, $1895; Sony PVM9L3, $900; Sony PVM8041Q, $400 Sony PVM8044Q, $500; Sony PVM8045Q, $700. 818-788-4700 or www.tvprogear.com.

SIGNAL PROCESSING

Want to Sell

Leitch FR-684 dual PS 2RU Frame, $295; Leitch FR-884 dual PS 2RU frame, $295; Leitch Mix-7001 multi-function digital frame, $400; Leitch 6804 mounting frame w/pwr sply, $250; Leitch SPG-2602N pulse gen, $1250; Grass Valley Series 8900 Frames w/redundant pwr sply, $600; GVG 8501 video DA's, $125; GVG 8551 audio DA's, $100; Sony BVX-D10/BVR-11, $3990; Leitch DPS-290 component TBC, $1200; Leitch DPS-465 TBC/digital component sych, $2250; Leitch DPS-470 digital component AV sync, $2990; Leitch DPS-475 digital processing sync, $3750. 818-788-4700 or www.tvprogear.com.

STATIONS

Want to Sell

Class A television station for sale, located in Kokomo, IN. WKGK-TV chnl 50, this is a commercial TV station & is the last & only TV station located in Kokomo, IN, we are now accepting bids for the sale of this valuable Commercial Television License, contact Sister Sue Jenkins, 317-920-1000 or 317-283-5800 or srsue@megsinet.net.

SWITCHERS

Want to Sell

Videotek RS-12DVA routing switcher, $600; Miranda Digipath 16x16 SDI router w/remote panel, $3500; Sierra Video 16x16 composite video router, $1500; Leitch 4x4 MB routers, $175; GVG Ten X, $600; Kramer 5x4 A/V switchers, new, $475. 818-788-4700 or www.tvprogear.com.

TELEPROMPTERS

TEST AND MEASUREMENT

Want to Sell

TEST EQUIPMENT

Want to Sell

Leader LV-5100 component digital waveform, $3990; Videotek TVM-821D SDI waveform/vector, $3995; Tektronix WFM601M SDI waveform, $5500; Tektronix WFM601A SDI waveform, $4500; Tektronix WFM601 SDI waveform, $3990; Tektronix 1731D PAL SDI vectorscope, $2000; Tektronix 764 digital audio monitor, $1500; Tektronix 760A audio monitor, $1000; Videotek VTM-100 on screen monitor, $1850. 818-788-4700 or www.tvprogear.com.

TRANSMITTERS/ EXCITERS

Want to Sell

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

VTRs/VCRs/ RECORDING MEDIA

Want to Sell

DSR-30, xlnt cond, full-featured DV CAM VCR, can make letterbox of your widescreen footage, $2000; (2) Sony S-VHS editing decks, SLV-1000 & SLV R5U, both xlnt cond, case or will trade for or into Mac dual G5 or hi-end Mac laptop. Bruce, 406-542-2595 or bbbacres@bresnan.net.

EMPLOYMENT

VTRs/VCRs/ RECORDING MEDIA Con't

Sony UVW-1800, lw hrs $5000; Sony PVW-2800, from $5000; Sony BVW-70 from $5000; Sony BVW-60,from $1500; Sony DSR-1500A, new, $5150; Sony DSR-45, new, $3895; Panasonic AJ-D950 DVCPRO 50 rcdr, from $6950; Panasonic AJ-D850 DVCPRO 50 rcdr, $3950; Panasonic AJ-D750 DVCPRO 50 rcdr from $3950; Panasonic AJ-D230H DVCPRO rcdr from $1895; Sony VO 9850 w/timecode, $1200; Sony VO 9800 w/timecode, $1000; Doremi Labs V1 digital video rcdr, $3900. 818-788-4700 or www.tvprogear.com.

Sony UVW-1800 rcdr/plyr, SP Betacam, $4400; Sony BVW-70 SP Betacam, $5500; Sony DSR-80 DVCam w/SDI video/audio options, $4600; Phillips DVCPro D660 rcdr/plyr, $3100; Panasonic DVCPro 750 rcdr/plyr, $6000; Sony VO-9800 w/TC, $900; Sony EVO-9720 Hi8 edit system, $700; Sony BVW-35 SP Betacam portable, $1500. 817-891-8080.

HELP WANTED

C / KU Hybrid Super Truck / Satellite Truck Operator: Satellite Technology Systems (STS) is seeking an experienced Satellite Truck operator to run our new C / KU / HDTV Hybrid Super Truck. www.stslivetv.com Work with the best equipment and best people in the business. Highest pay in the industry, 100K+ 4 weeks vacation and medical benefits. We are also accepting resumes for an operator on one of our KU SNG trucks. Please email your letter and resume to sts@mc.net or fax to (815) 728-1208.

Engineer in Charge: National Mobile Television, a leader in sports entertainment broadcasting, has openings for Engineer in Charge (EIC) in Miami, Florida, Boston and the New York/New Jersey area. The EIC is responsible for the overall management, operation and quality of a mobile broadcast unit. As supervisor on the unit, the EIC must maintain the unit and must also conduct necessary training of new engineers, assistant engineers and engineer trainees. In addition, the EIC must supervise technical crew and assist them with any technical problems related to NMT owned or NMT rented equipment. As part of the client service team, the EIC must maintain a courteous and professional demeanor at all times, representing the Company's best interest and, leading by example, must ensure the other engineering staff on the unit maintain the same helpful, client friendly attitude. This position requires a comprehensive understanding of Analog/SD/HD video and audio broadcast production systems. In addition to demonstrated engineering skills, the ideal candidate must possess good written and verbal communication skills and the ability to manage both staff and freelance technical crew. An AS Degree in Electronics (minimum) and SBE Certification or equivalent broadcast experience is required. If you meet the stated qualifications and are interested in applying for consideration, please submit your resume, with salary history to careers@nmtv.com. National Mobile Television, Inc. is an Equal Opportunity Employer and maintains a drug-free work environment. This is an IBEW Local 45 Union Position. Our benefits package includes Medical, Dental, and 401(k), paid holidays and paid vacation accrual. For more information about our company and what we do, visit our website at *www.nmtv.com*.

nep

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

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.

INTERCOMS

MANUFACTURER	MODEL	TYPE	CAMERA INTERFACE	INTERNET INTERFACE	EXPANDABILITY	FEATURES	PRICE
Clear-Com 800-877-1771 *www.clearcom.com*	RS-600 Series Beltpacks	Analog	Connects to 2- and 4-wire interfaces	2-wire distributed amplifiers	Can be interconnected through parallel connections	Lightweight and ergonomic; built-in limiters for mic and headset; adjustable mic level	Call for price
HME 858-848-4468 *www.hme.com*	Pro850	Analog	N/A	N/A	Multiple stations can be daisy-chained for several beltpacks	Frequency agile/exceptional operating range, wide frequency response with low distortion, simultaneous dual-channel operation	Call for price
Riedel Comm. 818-563-4100 *www.riedel.net*	Artist Matrix	Digital	Connects to 4-wire cameras without an external interface	TCP/IP routing through Ethernet interface	Non-block expansion from 8 x 8 to 1,024 x 1,024	Networking frames via fiber; broadcast-quality audio; programmable VOX; remote control; panels can be used for on-air announce	Call for price
	C-2 Digital Artist Beltpack	Digital	Connects to cameras via Artist Matrix	N/A	Daisy-chaining of beltpacks	Fully digital; noise- and hum-free; broadcast-quality audio; daisy-chaining; seamless integration with matrix	Call for price
Telex Communications 800-392-3497 *www.telex.com*	RTS ADAM	Digital	Direct connect to 4 wire	Native IP connection	Provides up to 1024 ports	Intelligent linking of frames, VOX, full ISDN and POTS interface, plug-in VOIP interface	Call for price
	RTS Chronus	Digital	Direct connect to 4 wire	Native IP connection	128-port matrix system	VOX, full ISDN and POTS interface, VOIP interface	Call for price
Trilogy Broadcast 800-268-4081 *www.trilogy-broadcast.uk*	Mercury	IP Digital	Direct connect to 4-wire	Native IP connection with standard RJ45	Infinitely scalable port	Full-featured intercom on LAN, WAN, Internet or over satellite	Call for price
	Commander	Digital	Direct connect to 4-wire	Compatible with Mercury	576 ports	Full-featured digital matrix	

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66	Altronic Research	www.altronic.com
5	Avid Technology	www.avid.com
26	Azden Corporation	www.azdencorp.com
33	B&H Pro Audio	www.bhphotovideo.com
59	B&H Pro Audio	www.bhphotovideo.com
47	Belden Wire & Cable Company	www.belden.com
53	Broadcast Software Solutions	www.broadcastsoftware.tv
35	Calrec Audio Ltd.	www.calrec.com
1	Chyron Graphics Corporation	www.chyron.com
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52	Eartec	www.eartec.com
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14	Kino Flo Inc.	www.kinoflo.com
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29	Linear Acoustic	www.linearacoustic.com
28	Lowel Light Manufacturing	www.lowel.com
44	Marshall Electronics	www.lcdracks.com
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46	Moseley Associates	www.moseleysb.com
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Tribune Revenue Dips

CHICAGO

Tribune experienced nearly a 0.9 percent decline in revenue for August 2005.

Consolidated revenues were $428 million, down from $432 million for the same month last year.

Broadcasting and entertainment group revenues in August increased 1.5 percent, to $131 million, up from $129 million last year. Television revenues decreased 3.5 percent, offset by a slight advertising revenue increase.

Nielsen Local People Meters—new measurement tools to track what people are watching at home—have had an impact on television revenues in New York, Los Angeles, Chicago and Boston, Tribune reported.

The company's broadcasting group operates 26 television stations, Superstation WGN on national cable, Chicago's WGN-AM and the Chicago Cubs baseball team. ■

Craig Tapped As New Ascent Media COO

SANTA MONICA, CALIF.

Ascent Media Network Services has tapped Margaret Craig as its new chief operating officer.

Craig will be responsible for the company's worldwide content distribution operations, and will work with the senior management team on strategic initiatives.

In this newly created position designed to achieve leadership and consistency goals, Craig will also establish platforms to support new technologies and services as the company plans for more global expansion. She has international business experience with a focus on European and Asian markets.

Craig formerly served as president and chief executive officer of Leitch and has held executive-level roles with Snell & Wilcox and Tektronix. ■

Avid to Give CBS News Ops Digital Makeover

AMSTERDAM, THE NETHERLANDS

Avid announced at IBC a multimillion dollar broadcast deal with CBS to install digital newsroom environments at the network's New York City headquarters and London news bureau.

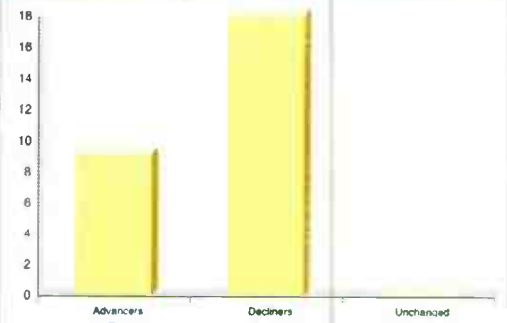
The Tewksbury, Mass.-based company's largest broadcast deal to date is expected to be complete by December 2006. CBS purchased Avid Professional Services for training alongside a mix of Avid systems, including Avid Unity for News with up to 64 TB of storage, Avid NewsCutter Adrenaline news editing systems, an Avid Workgroup logging and browsing system and a digital archive system with third-party partners SGL and StorageTek.

With the new systems in place, CBS reporters can perform searches for high-resolution clips from anywhere in the newsroom and edit during the ingest process, improving the news operation's production workflow and ability to handle breaking news stories, according to Avid.

Adam Taylor, vice president of worldwide sales, operations and services for Avid, called the deal "a new chapter" in the company's long-standing relationship with CBS, which has been using Avid gear for more than 10 years for such CBS programs as "60 Minutes," among others.

CBS follows the digital path of other major news operations, ABC and NBC, which also have installed Avid digital news production systems at their network news operations sites. ■

WIN-LOSE RATIO



TOP ADVANCERS BROADCAST STOCKS
(Sept. 2 - Sept. 16)

Meredith	+ 2.16%
LinTV	+ 1.19%

TOP DECLINERS BROADCAST STOCKS
(Sept. 2 - Sept. 16)

Young	- 11.78%
Nexstar	- 7.45%

TOP ADVANCERS TV STOCKS
(Sept. 2 - Sept. 16)

Ciprico	+ 23.94%
Avid	+ 7.13%

TOP DECLINERS TV STOCKS
(Sept. 2 - Sept. 16)

Tektronix	- 7.15%
SeaChange	- 4.10%

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

TV Tech STOCKS as of Sept. 16

Company Name	52-Week Range	Sept. 2	Sept. 16	% Change
Avid	36.78 - 68.35	40.95	43.87	7.13%
Belden	17.65 - 24.59	21.17	21.05	-0.57%
Ciprico	3.23 - 4.90	4.01	4.97	23.94%
Harmonic	4.25 - 12.40	6.03	5.85	-2.99%
Harris	24.85 - 41.82	37.8	40.05	5.95%
Leitch	6.72 - 11.50	13.77	13.84	0.51%
LSI Logic	4.01 - 10.75	9.66	9.5	-1.66%
Sci. Atlanta	24.61 - 39.89	37.97	39.11	3.00%
SeaChange	5.60 - 19.75	6.1	5.85	-4.10%
Tektronix	20.97 - 34.39	25.45	23.63	-7.15%

Broadcast STOCKS as of Sept. 16

Company Name	52-Week Range	Sept. 2	Sept. 16	% Change
Acme	3.30 - 7.45	4.05	4	-1.23%
Belo	21.65 - 26.45	24.25	23.58	-2.76%
Emmis	15.29 - 24.49	23.47	23.4	-0.30%
Entravision	7.06 - 9.11	7.88	7.55	-4.19%
Fisher	42.56 - 52.60	48.6	48.99	0.80%
Gray	10.58 - 15.74	12.24	11.6	-5.23%
Hearst Argyle	23.73 - 26.48	25.73	25.58	-0.58%
Nexstar	4.52 - 9.63	5.77	5.34	-7.45%
Lin TV	13.68 - 20.45	15.09	15.27	1.19%
Paxson	0.48 - 2.15	0.6	0.56	-6.67%
Sinclair	6.12 - 9.57	9.29	9.39	1.08%
Liberty	34.32 - 48.05	47.81	47.34	-0.98%
Univision	25.00 - 33.03	26.46	25.42	-3.93%
Young	3.15 - 12.59	4.16	3.67	-11.78%
Tribune	34.53 - 44.32	37.98	37.6	-1.00%
Meredith	44.51 - 54.57	49.11	50.17	2.16%
EW Scripps	44.73 - 52.91	49.94	49.39	-1.10%

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