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TV TECHNOLOGY

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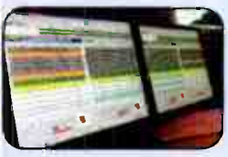
WHAT'S INSIDE



TV Debates Ensue on Hill

Retrans, a la carte and ownership weighed

by Deborah D. McAdams

WASHINGTON

TV is all the rage on Capitol Hill, despite a greater amount of ink devoted to Medicaid, lobbying tactics and domestic surveillance. The FCC's revised report on a la carte cable channel pricing renewed Sen. John McCain's (R-Ariz.) intention to legislate cable rates. Retransmission consent is under scrutiny in the Senate Commerce Committee. The battle over media ownership rules is coming back to life as the FCC finally gets a full contingent of commissioners. A typo in the budget bill containing the 2009 analog TV deadline sparked calls for an ethics investigation, and if that weren't enough, House leaders are promising a new telecom bill before the NAB convention.

"We expect to be marking up a bill in subcommittee in March," and through the full Commerce committee by Easter, said Fred Upton (R-Mich.) chairman of the House Internet subcommittee.

Upton laid out the timeline at a Washington

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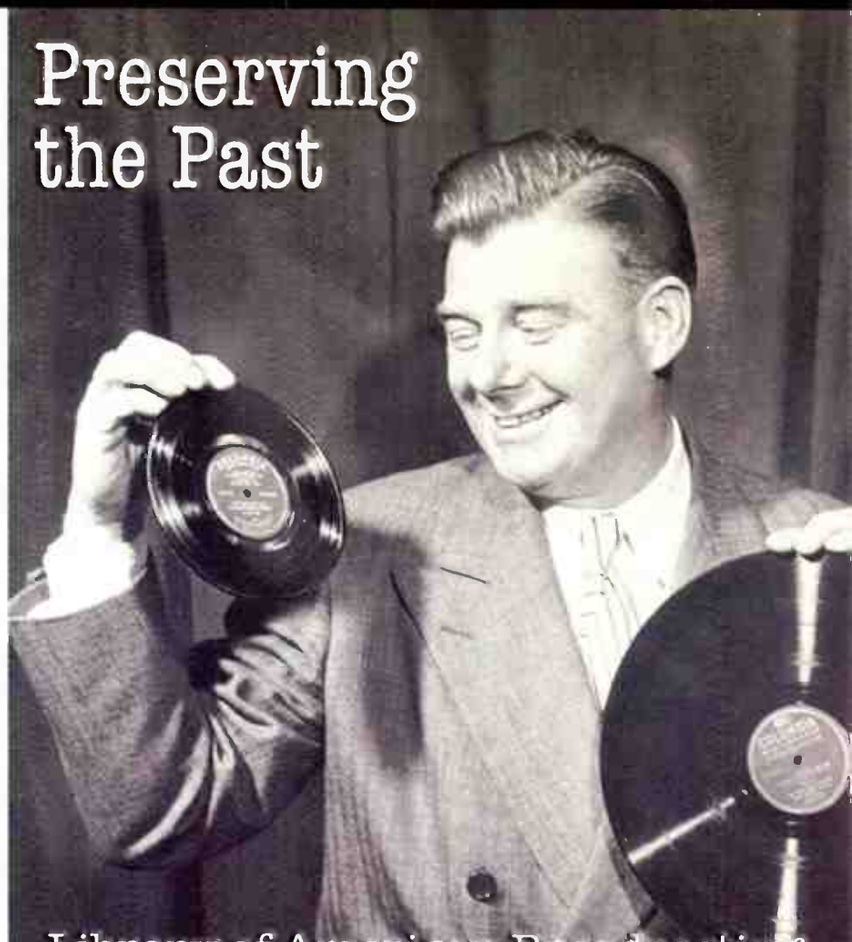
Preserving the Past



Library of American Broadcasting catalogs TV and audio artifacts

by James E. O'Neal

COLLEGE PARK, MD.

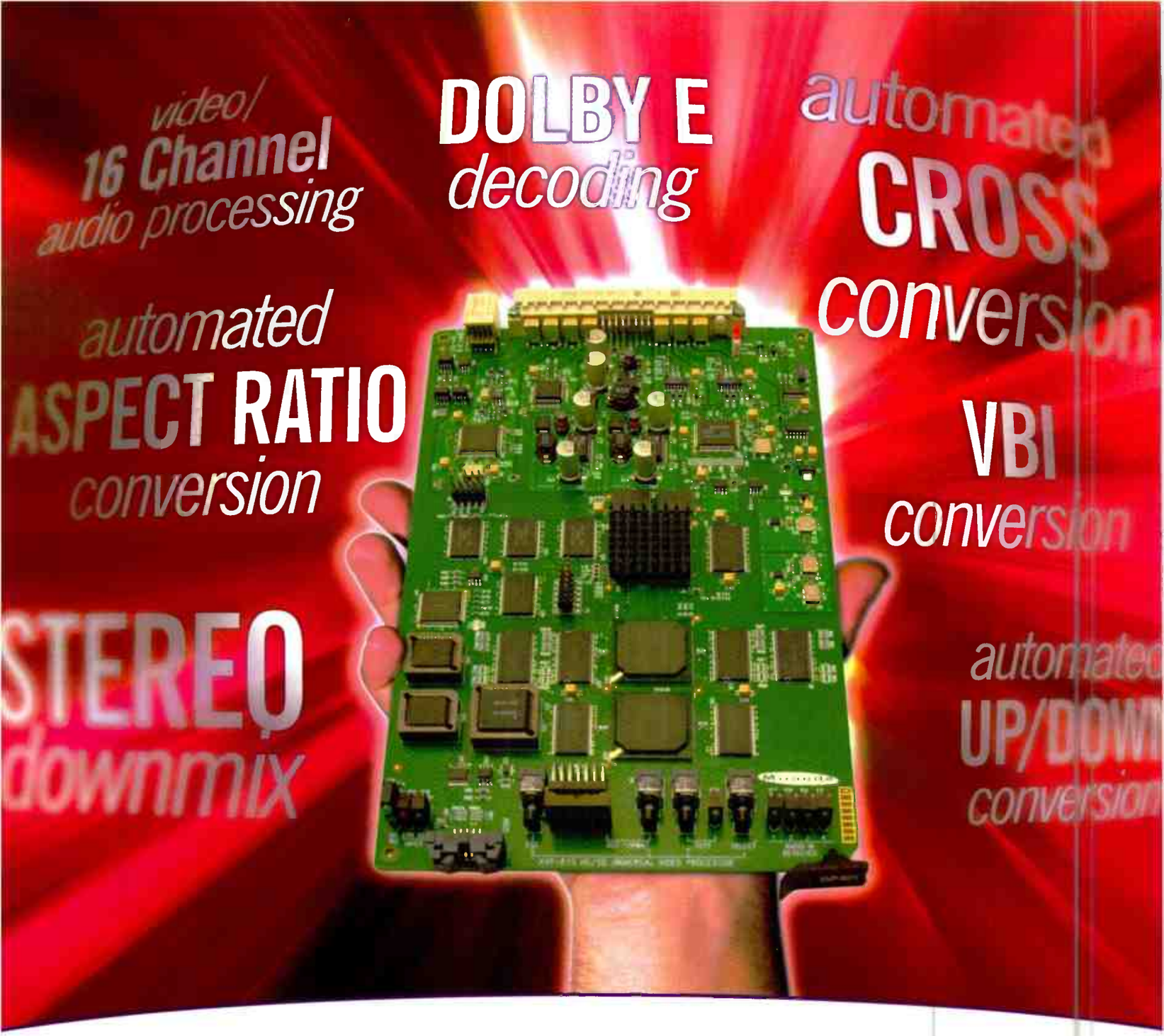
Although great technological strides have been made in preserving the vast library of videotape generated by TV stations over the past 50 years, much more needs to be done to preserve this material for future generations.

So says Chuck Howell, curator of the Library of American Broadcasting at the Hornbake Library building at the University of Maryland in College Park, Md.

At a recent meeting hosted by SMPTE, Howell and James Snyder, technical advisor to the library, discussed the collection and the importance of preserving the video past.

"We have a tape here dated Sept. 15, 1958 and labeled 'Arthur Godfrey-Top

PRESERVING, PAGE 10



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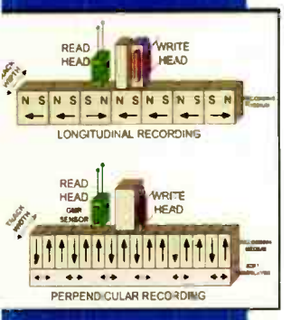

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An update on centralcasting

On the cover: The late Arthur Godfrey, CBS radio and TV star. Photo supplied by The Library of American Broadcasting.

CONTRIBUTING WRITERS

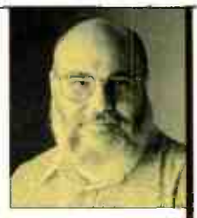
Dave Moulton

Inside Audio

History buffs and reasonably alert readers may recall that back in the day (2003-04), I wrote several articles dealing with the disarray of audio levels at our beloved end-users' sofas, couches and recliners. Among other things, I noted that (a) we experience a variance... p. 30

Andy Ciddor

Let There Be Lighting



I suppose that it's just another example of market forces at work, but still I'm troubled by the constant escalation of what are usually referred to as "production values" in the shows that we make. Maybe it's because I'm not often a beneficiary of the accompanying budget... p. 32

Frank Beacham

Net Soup

Over the past year there's been much news about the distribution of television programming over the Internet. However, a revolution in the work habits of those who use the 'Net to research stories and collaborate in the making of films and television programming... p. 33

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FROM THE EDITOR

Super Spots

First things first: Congratulations to Pittsburgh for their Super Bowl victory. It was a stellar season for the Steelers.

Now that we got that out of the way, I wanted to turn your attention to what is increasingly becoming an important focus to Super Bowl fans, and that of course is the wardrobe malf... no, I mean the ads.

By now, we've all acknowledged the importance of commercials to the Super Bowl. The ads themselves sport production values that rival a Peter Jackson extravaganza. You know things are getting out of hand when you start getting invited to "Super Bowl Ad" parties.

And while the critics were lukewarm to the quality of the ads this year, the one aspect (pun intended) that stood out this year was the increase in high-definition ads. More than half of the ads were produced in HD for the Super Bowl. Combine this with the HD ads in the Winter Olympics and this one-two punch was perhaps the shot in the arm that the advertising community needed to get on the HD bandwagon.

Whatever the impetus, be it the increase in HDTV sets in U.S. homes, the increase in HD programming or the decrease in HD production costs, it's a welcome sign, and it completes one of the last important pieces of the HD puzzle.

Tom Butts
Editor
tbutts@imaspub.com

* * *

Randy Hoffner's column "What Time Is It?" (Jan. 11) contained a key error that he wanted to clear up. Randy writes:

"My recent column on time requires a clarification and an outright correction. First, my description of solar time should have read, 'A solar day lasts from the time the sun is directly over a given point, for example, over the Prime Meridian that passes through Greenwich, England, until it is next over that same point.' We know that the northernmost point on that meridian at which the sun is directly overhead is the Tropic of Cancer, which is considerably south of Greenwich.

Secondly, 'latitude' and 'longitude' were transposed several times in the article. Latitude is the distance north or south from the Equator, and latitude lines are parallel to one another and circumscribe the globe. Long before the invention of the ship's chronometer in the mid-Eighteenth Century, sailors were able to determine their latitude at sea by the position of the sun and other celestial objects.

Longitude is the position east or west on the globe, and longitude lines run from the North Pole to the South Pole. Thus, they meet each other at the poles, and, consequently, the distance covered by 15 degrees of longitude, corresponding to an hour's time, varies from 1020 miles at the equator to virtually nothing at the poles. Until England proclaimed that the longitude line running through a specific point in Greenwich was designated 0 degrees, longitude designations were completely arbitrary. Further, the ability for a sailor at sea to accurately determine his longitude awaited the invention of the ship's chronometer, because in order to make that determination, he needs to know the exact time at both his current location and at his home port, simultaneously.

Apologies for this confusion. I am grateful that **TV Technology** is not a spelunking magazine, because if it were, I would have to learn the difference between stalactites and stalagmites!"

LETTERS

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

Interlace Appraisal

Dear Editor:

I have just read Randy Hoffner's article "Why Do We Interlace?" on TV Technology.com.

Thank you for a clear and detailed explanation accessible to a person of modest prior knowledge but which doesn't gloss over the complexity. I have wondered about this topic before and finally did some Googling, only to be disappointed at serveral explanations and even some apparently erroneous ones before I ran into yours. I also had no idea that in projection, each frame of a movie is flashed twice to please the eye/brain. Clever.

I have a Panasonic AG-DVX100a and aspire to filmmaking using 24p, hence my curiousity.

Steve Berlin
Sacramento, Calif.

A Display Crisis?

Dear Editor:

I found Randy Hoffner's column, ("Maybe the CRT isn't Quite Dead Yet," Dec. 7, 2005) to be curious, particularly since he did not mention the reduction of CRT monitors in the professional market. Sony has discontinued its mid-priced PVM series, and other manufacturers are doing the same, thus putting new CRT monitors out of reach for many users who cannot afford the remaining high-end products. I'm quite concerned about this change in the professional display market and not looking forward to LCDs becoming primary production monitors! This is just the beginning of what I perceive as an upcoming "display crisis" in which neither pros nor consumers will have a basis for trusting their displays.

I have been told this development is due to legislation in Europe and Asia requiring reduction of lead and other heavy metals, causing manufacturers to reduce CRT production for all markets, including the U.S. If this ecological mandate is true, shouldn't this also affect CRTs for consumer televisions: If, as Randy points out, CRTs will continue to be improved and sold globally, why should they become unavailable to professionals here?

Eric Wenocur
Silver Spring, Md.

Needed to Be Said

Dear Editor:

Craig Johnston's article "Smaller Cameras Present Peripheral Gear Problems," (Jan. 25), was spot on!

The fact that there aren't any really good, affordable tripods for these smaller camcorders has been an annoying challenge I have faced for several years.

Thank you for saying what needed to be said!

Bud Anderson
Columbia, S.C.

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Frezzi Robotics Captures Hussein Trial

HAWTHORNE, N.J.

Desert Sky Digital, a digital production company hired to cover the trial of Saddam Hussein in Iraq, is using Frezzi Energy System robotics to provide a system that integrates 12 broadcast cameras.

"Our engineers, technicians and programmers worked around the clock to deliver the system on time and in spec," said Jim Crawford, president of Frezzi. "We knew the importance of having a reliable system which was burned in and prestaged here in the factory and then ultimately be installed half way around the world."

Frezzi provided Desert Sky Digital, a division of Constellation Satellite Co., with a system that includes nine cameras with robotic pan-and-tilt heads, three fixed cameras, three controllers and one CPU rack case. The system is scalable and can be upgraded to control 18 robotics heads.

The three controllers are configured to control any of the nine robotic cameras. Timeline presets are fully programmable for on-the-fly set-up of predetermined shots and timed convergence. Video preview is available on an integrated 7-inch LCD touch panel.

Robotics

MovieBeam Relaunches in Hi-Def

BURBANK, CALIF.

MovieBeam, the broadcast video-on-demand service from Disney, has relaunched in high definition.

The service offers 100 movies available immediately, with up to 10 new titles automatically delivered digitally each week through MovieBeam's over-the-air datacasting technology. The cost of renting a movie is about the same as movie rental store prices and each rental is good for a 24-hour period.

The service requires a MovieBeam set-top box, which features a 160 GB hard drive. The system is sold online and in consumer electronics stores including Best Buy, CompUSA and Sears. Key features of the service include access to available high-definition movie titles, full playback functionality, a pay-as-you-go model, and movie availability on the same day of select DVD releases.

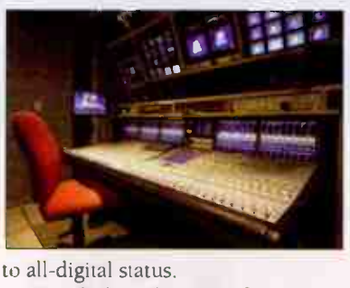
The new and improved MovieBeam will be rolled out in 29 cities, including New York, Los Angeles and Washington, D.C. The company was originally founded by Disney four years ago. Cisco Sytems, Intel Corp., and three venture capital firms joined Disney in pumping $48.5 million into the service.

VOD

SSL Helps WHDH Complete Transition

BOSTON, MASS.

NBC affiliate WHDH-TV has completed installation of a Solid State Logic C100 Digital Broadcast Console in its new control room, wrapping up the broadcaster's move to all-digital status.



Jim Shultis, director of engineering at WHDH said the C100 was a perfect fit for the fast-paced facility, which features substantial live programming.

He said the new system needed to meet the demands of WHDH's more than six hours of daily live news broadcasts, something the old analog audio console just couldn't do. The C100's reliability in meeting this need was a major reason why the station chose SSL.

Shultis said additional C100 selling points included flexibility of the metering, robustness, speed of the operating system, flat-panel TFT displays, and the 5.1-channel audio that will help the station transition to HD surround sound within the next three years.

Audio

IBM Creates Faster Chipset

YORKTOWN, N.Y.

IBM has created a new silicon chip allowing wireless devices to operate 10 times faster than the WiFi networks of today.

Using the company's "silicon germanium" chip technology," the chipset is able to send and receive information in the 30 GHz to 300 GHz or extremely high frequency spectrum range, a portion that can carry much higher volumes of data than possible at lower frequencies.

"In the past, wireless has always lagged in speed compared to wired communications, making it frustrating for users who want to enjoy the same access and applications regardless of where they are," said Dr. T.C. Chen, vice president of Science and Technology at IBM Research. "This new technology has the capability to reduce or eliminate this 'download divide,' realizing the full potential of wireless communications and changing the way we live."

Among the applications for this EHF technology are wireless personal-area networks for intra-office communications and wireless home networking for HDTV.

The technology allows the chipset module to include the receiver, transmitter and two antennas in a space no larger than a dime.

Technology

Comcast Taps Tandberg for VOD Ads

ATLANTA

Comcast Spotlight, the advertising sales division of Comcast Cable, has rolled out the first phase of the Tandberg Television AdPoint, a new technology that automatically places ads in on-demand content.

The AdPoint system is comprised of components to allow users to create ad campaigns, track on-demand programming assets and ad content, make decisions for ad placement and provides tools to mark advertising opportunities in on-demand content.

"The changes taking place in the industry are affecting every link in the value chain, and technology platforms that can help the various players work collaboratively will be key to success in delivering differentiated content," said Reggie Bradford, president of Tandberg Television.

Initially, ads are being inserted into content on the SuccessTV, Music Spy Videos and DriverTV networks, with plans to rapidly expand ad placement to additional on-demand content.

Advertising

Sundance Winner Shoots with Panasonic

SECAUCUS, N.J.

Filmmaker James Longley used Panasonic AG-DVX100 series mini-DV 3-CCD 24p camcorders to shoot more than 300 hours of film in two years to make his award winning documentary, "Iraq in Fragments."

The film won several awards at the 2006 Sundance Film Festival including Excellence in Cinematography, Excellence in Documentary film editing and the Documentary Directing award.

Longley, director, cinematographer, editor and executive producer of the film said he felt "uninhibited" in his use of the camera and did things he normally doesn't try with a more expensive piece of equipment. He praised the cameras for their affordablity and ability to withstand extreme weather, dust and heat. He also called the self-cleaning heads a "lifesaver."

"I put the camera inside the openings of brick ovens, ran full-speed with the camera down Baghdad alleys and shot during dust storms at 110 degrees. At one point the camera got so hot during the filming of a brick factory in northern Iraq that the Rycote wind cover on my microphone caught on fire. But the camera never stopped recording," he said.

Longley said he plans to use the Panasonic AG-HVX200 handheld HD solid-state P2 camcorder in his next project.

Documentary

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Hoop Dreams Realized

March Madness goes portable, mixed and full circle

by Robin Berger

INDIANAPOLIS

CBS expanded its March Madness franchise earlier this year by completing its acquisition of CSTV, billed as the leading digital media company devoted exclusively to college athletics.

The Tiffany network also plans to tweak its HD coverage with a new game truck, graphics, and upgraded transmission paths according to Ken Aagaard, senior vice president of operations for CBS Sports, while CSTV's offerings will be dictated by CBS SportsLine.com.

Elsewhere, ESPN planned to launch "Full Circle" blanket coverage, beginning with the March 4 game between North Carolina and Duke; DirecTV is offering its Mega March Madness Mix Channel; and Sprint subscribers will get video updates from a local North Carolina broadcaster on their cell phones.

CBS

CBS SportsLine developed technology to better handle the anticipated "crush of traffic" to its namesake and CSTV Web sites, now that their March Madness content is free for the first time, said spokesman Alex Riethmiller.

CBS will use F&F Productions' new GTX-14 truck, which came onboard last September for the network's coverage of college football. The network also used the GTX-14 to cover college basketball games in HD during the regular season. A dozen Ikegami HDK-79EC cameras replaced the Thomson cameras CBS used in 2005. Yamaha's digital D-1 console substitutes for last year's SSL model. And Vizrt graphics replace the SGI equipment used for clock-and-score last year.

"We've replaced the SGIs mainly due to age and processing time," said John McRae, director of field operations for CBS Sports.

CBS will use fiber to transmit HD footage from eight of the 14 venues.

"There's an operational advantage to being on the ground," said David Chilson, associate director of broadcast distribution services for the network. "When your signal's up in the air, it's subject to the issues of satellite interference."

Moreover, Chilson added that Vyvx provides a diversity of routing from its various POP locations to CBS' New York broadcast center. The fact that Vyvx became economically competitive clinched the deal.

"We're providing HD feeds out of arenas where we have connectivity in place in our VenueNet product," said Derek Smith, senior vice president for Vyvx, the Tulsa, Okla.-based provider of video transport services. "The production truck can just pull in, connect into our VenueNet box, and they have connectivity all the way back to their broadcast center instantaneously."

More capacity was recently added to seven venues: the Cox Arena in San Diego, Wachovia Center in Philadelphia, The Palace of Auburn Hills, Mich., Georgia Dome in Atlanta, California's Oakland Arena, MCI Center in Washington, D.C., and Metrodome in Indianapolis.

CBS "wanted to grow the number of [HD] return feeds coming out of those venues," said Smith said. "On the high-definition piece, we increased our capacity by 50 percent."

WRAL WIRELESS

Last year WRAL, the CBS affiliate in Raleigh, N.C., offered Sprint and Verizon cell phone users its "WRAL Wireless" service, which updated TV game schedules and scores on their mobile phones and provided text recaps of game highlights. This year, the service will be expanded to include video recaps and abbreviated highlight reels.

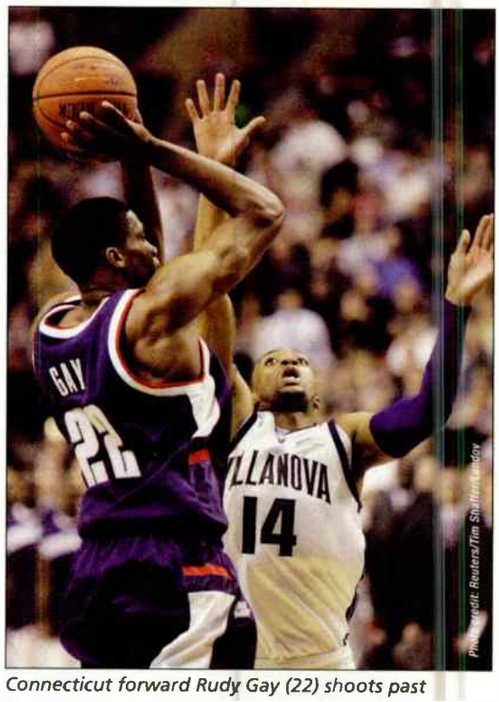

Photo credit: Reuters/Tim Shaffer/Today

Connecticut forward Rudy Gay (22) shoots past Villanova guard Allan Ray (14) during second half NCAA basketball action in Philadelphia in February.

"At the ACC tournament we have our own shooters and reporters doing WRAL coverage, and that's what we'll be leveraging," said Sam Matheny, general manager of News Over Wireless, WRAL-TV's sister company. "At the NCAA, we send our own photogs and reporters as well."

Matheny estimates that mobile users will probably receive approximately 20 to 30 seconds of video per game.

"We're taking advantage of the media player that's built into certain phones," he said, adding that over the past year, "there's been a flurry of new multimedia-enabled phones and the deployment of third-generation EV-DO technology."

Evolution Data Optimized technology is the high-speed packet rate standard for the CDMA (Code Division Multiple Access) platform used by carriers like Sprint and Verizon. Matheny estimated it would boost data transmission from last year's 50 kbps to about 300 kbps, making them better suited to handle streaming video.

News Over Wireless designed the app, wrote all the software, and built the infrastructure, encoding the video using 3GPP2 (Third Generation Partnership Project II), according to Matheny. The 3GPP2 mobile encoding standards set specifications for the radio transmission technologies used on the CDMA platform. Matheny's group also used the QCIF standard for resolution (176x144 pixels).

Sprint and Verizon subscribers can get the "WRAL Wireless" text and image update service for $2.99 to $3.99 a month; Sprint subscribers with the requisite multimedia phone can get "WRAL Wireless plus Video" for a $4.99 monthly fee.

"There's been a flurry of new multimedia-enabled phones and the deployment of third generation EV-DO technology."

—Sam Matheny, WRAL Wireless

WRAL Wireless will expand its coverage of the NCAA tourney this year with streaming video to cell phones.

ESPN

ESPN franchises will tag-team coverage of the North Carolina at Duke playoff game on March 4 to launch the network's "Full Circle" concept, which consists of ESPN's traditional telecast, ESPN2's "Above the Rim" camera angle, ESPN360's stats-driven broadband games and ESPNU's view from Duke's "Cameron Crazies" section of the arena.

High-definition coverage will be offered on ESPN and ESPN2 HD. Mobile ESPN will deliver game alerts and live updates; ESPN.com will host live chats; and both will have in-game polling. ESPN International will offer feeds to about 120 countries.

Mobile ESPN was "designed from the ground up," said the division's senior vice president, Manish Jha. "We've done a whole bunch of things that are fairly innovative, from ease of use to the comprehensiveness of the service to the timeliness of the information and level of personalization."

The technology's back-end architecture enables news delivery several seconds ahead of broadcast delivery. For example, Jha said Super Bowl updates were two seconds behind the stadium clock, but eight seconds ahead of the ABC broadcast (including the mandated 5-second delay).

ESPN's uniquely designed Sanyo MVP cell phone rolled out for sale online for the 2005 holidays, and was brought to retail last month. It delivers one-touch, real-time access to personalized sports content, Gamecast, video clips and fantasy updates. The main display reportedly delivers three times the resolution of a conventional cell phone. A 1.1-inch, 160-color external LCD displaying a score ticker and picture Caller ID is also included,

HOOP, PAGE 22

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Preserving

CONTINUED FROM PAGE 1

Dollar.' This is the oldest videotape in the collection and it's probably one of the oldest video recordings still extant, as the first videotape machine was delivered only a little over two years earlier," Howell said, referring to the 30-pound "quad" tape contained in a plain brown cardboard box.

The recording is but a small part of the library's vast collection of audio, film and video materials.

Library recordings span over eight decades. The oldest item is a "test pressing" of a 1925 transatlantic radio broadcast and one of the latest arrivals is a run of "Buffy the Vampire Slayer." NBC and PBS are well-represented. The Library even has a collection of tapes from the Advanced Television Testing Center documenting work in setting U.S. digital television standards.

However, the most complete grouping of items came from the estate of the late radio-television personality, Arthur Godfrey. In addition to videotape and kinescope television recordings, there are plenty of audio recordings. These aren't only on quarter-inch tape; 16-inch "electrical transcriptions" and thousands of wire recordings bearing Godfrey's nasal tones and plugs for Chesterfields and Lipton Tea make up a big part of the collection. In addition, there are scores of boxes containing scripts with Godfrey's handwritten markings and notes.

"A recent example of what we do around here was supplying photographs and other materials used in creating the mock CBS studios for the filming of 'Good Night and Good Luck,'" Howell said. "We also supplied material for the PBS documentary 'Empire of the Air.' We have such a wealth of material—it ranges from scrapbooks and trophies donated by the family of WOR's John Gambling to BBC glass-based transcriptions of one of Glenn Miller's last performances."

CLIMATE CONTROL

When pressed for an exact quantity of items owned by the library, Howell did not have a hard answer. He did note that a recent relocation of materials involved more than one and a half miles of shelving.

The biggest problems associated with such collections are physical preservation of the items and the recovery of information from them. Howell said that great advancements had been made in achieving the proper climate control necessary to prevent deterioration of the library's materials, but noted that more remained to be done in areas such as cold storage and re-humidification.

Recovering recorded information is especially daunting. For a long time, broadcasters have been faced with the videotape "format-of-the-month" challenge. Two-inch or quad video recordings were the mainstay of the industry for about two decades. This changed in the 1970s with the advent of 3/4-inch, one-inch and 1/2-inch format variants. Then came digital. Acquiring and maintaining devices to play back all of these formats is a nightmarish proposition.

The library has managed to acquire four quad VTRs—early RCAs and an Ampex VR-2000 and AVR-2. There are no spare parts or service manuals for them and Snyder appealed to anyone with such items to donate them to help restore one or more VTRs to operating condition. The library is looking for additional VTRs and other broadcast gear, especially if it's operational.

"If we have room for such equipment, we'll take it," Snyder said. "We're trying to preserve a lot of broadcasting history in addition to the recordings."

Now in the planning stage is construction of an operational recreation of a 1975 vintage master control room. This would include VTRs, film islands, a switcher, monitors and all necessary ancillary equipment.

"Most libraries are just storage for recordings. They have no equipment for playback. We want to be different," Snyder said. "The point isn't just preservation. The point is to be able to use the material."

Plans are being made to transfer as much of the collection to "modern" digital media as soon as practical, with the "most endangered" recordings having priority.

"Tape, while it lasts a long time, does not last forever. We want to save this content on digital videotape or digital data tape," Snyder said. He added that in transferring material, data compression needed to be avoided as much as possible, citing loss of quality issues associated with multiple compressions and transcodings.

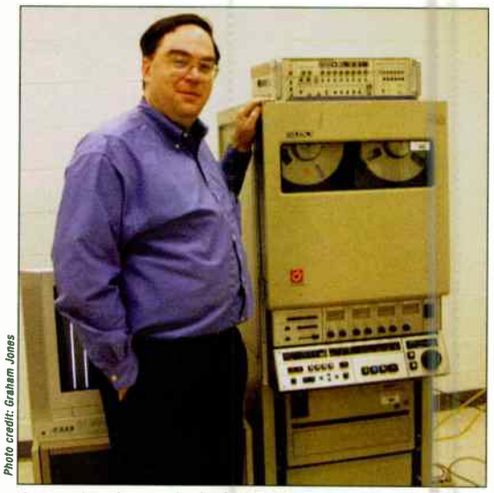

Photo credit: Graham Jones

James Snyder, technical advisor to the Library of American Broadcasting in College Park, Md., prepares to screen a CBS promo on the library's Sony BVH-1100 VTR.

Snyder said the library has three main goals:

- To preserve, through copying, as much of the historic record as possible.
- To maintain a stock of legacy machinery for playback of legacy formats.
- To provide services to all comers at a more affordable price than commercial dub houses will permit.

A current project being studied by the group is the design and construction of a modern version of a wire recorder.

"It may be necessary at some time to build a new quad machine too," Snyder said.

An immediate goal is to put one or more of the existing quads into service. Donations of equipment or funds are needed and welcomed, as the organization is not-for-profit and is supported by grants and donations.

As Snyder put it, "It's sort of like working for public broadcasting."

(If TV Technology readers have equipment, parts or manuals that would be of use to the archival project, they are encouraged to contact the library at 301-314-0401 or to e-mail Howell at chuckh@umd.edu. Especially helpful would be the donation of a two-inch helical scan VTR, as well as small air compressors and vacuum systems for the quad machines now owned. Collections of recordings, papers and other broadcast-related artifacts are welcomed too.) ■

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Metadata's Expanding Role in Automation

Vendors hope new SMPTE standards will enhance workflow

by Claudia Kienzle

HAMILTON, N.J.

As stations move to a tapeless, server-based workflow, broadcast automation has swelled to encompass everything from media ingest to archive, and from the play-out of a single channel to multiple channels simultaneously.

Today's automation systems have become modular suites, with new software layers dedicated to managing this increasingly complex workflow and the massive databases that reside on servers and other storage devices.

Many automation systems now use metadata to keep track of media under their control and to ensure that scheduled media plays to air on-time and in the proper sequence.

COVERING BASES

Steps are being taken to help broadcasters bring the management of this media in an automated environment under control.

"The challenges of managing broadcast metadata are timeliness and interpretation. Efficiencies are derived by enabling a task to be performed as early in the workflow as possible. Automated delivery of the appropriate metadata allows this," said Robert C. Johnson, president of Sundance Digital in Irving, Texas.

To accomplish this, SMPTE has initiated a standard for messaging between traffic, automation, program management, and digital delivery systems. Developed by the organization's S-22 committee, the protocol will enable real-time metadata updates to flow between the systems much earlier in the workflow than currently happens. Message classes include: media updates, dubbing, recording and digital ingest and playlist.

Sundance Digital Titan automation tracks a range of metadata about each media element in its powerful SQL databases. Titan performs two key workflow functions—managing content ingest and tracking; and controlling play-to-air as scheduled by the traffic department. In addition, Sundance Seeker media asset management solution is tightly integrated with the on-air automation system and video servers, and it communicates with other broadcast devices, editing solutions, and back office business systems.

> "It is critical to know how and where you use metadata, and to have a deep understanding of your business workflow and what you want to achieve."
>
> —Ian Fletcher, OmniBus Systems

OmniBus Systems CTO Ian Fletcher

Neal Perchuk, Florical vice president of sales and marketing echoed Johnson's sentiments about the importance of the SMPTE standard.

"SMPTE's adoption of the S-22 recommended practice means that traffic and automation will be able to interchange metadata more effectively," said Perchuk. "Exchange of metadata between parties at the broadcast facility allows for having the relevant information in automation to provide operators with feedback on what has happened; what is happening; and what they have yet to do."

Florical MediaMaster provides asset management for program and interstitial material on video servers, in libraries and archives to enable efficient usage of material through the broadcast workflow.

AirBoss, which provides frame-accurate automation of on-air broadcast presentation and commercial insertion, is used by KGO-TV in San Francisco to automate its analog, DTV, and HDTV channels. It also provides complete redundancy for the three channels by using a "hot standby" automation system that mirrors the play-to-air schedule of the primary system, even during live events.

IDENTIFY GOALS

For OmniBus Systems, automation goes beyond play-out to encompass end-to-end automated workflow processes that span ingest, storage, archive, media management, quality control, and final transmission. With its new products for NAB2006, OmniBus has taken a flexible, scalable and modular approach to support every aspect of automating a modern broadcast operation.

"The key thing to realize about using metadata is that it's a business issue, not a technical issue. It's about understanding what your processes are before you even start to change them," said Ian Fletcher, CTO at OmniBus Systems, in Loughborough, U.K. "It is critical to know how and where you use metadata, and to have a deep understanding of your business workflow and what you want to achieve. You can use that information to decide what you want to keep and what you want to change.

"Each broadcaster must identify specific business goals, whether in the realm of cost savings, greater efficiencies, the capacity to run more channels, or the ability to target different platforms," Fletcher said. "It is only when you've defined these workflows that you can begin to think about what metadata is required to flow between the different stages of these workflow chains."

GETTING CONTROL

Pro-Bel's Morpheus automation platform was designed with core technologies enabling multichannel automation to be cost-effective, scalable, and operator friendly. A core feature, MediaBall, allows the most complex sequences of events to be packaged in a way that provides simple presentation to an operator and easy manipulation within a schedule.

"The ability to interface to third party systems has always been core to automation systems, and regardless of how 'standard' an interface may be, software development is nearly always required to some degree," said Neil Maycock, who was recently named president of Pro-Bel Americas, in Melville, N.Y. "This affects the cost of a system and the timescales to deliver

METADATA, PAGE 16

"We selected Omneon servers and shared storage for playout, and have since connected our production processes. Omneon is the one solution that fits our tight budget, meets all our requirements today and supports us as our needs change."

Helge Blucher
Vice President
Detroit Public Television

Detroit Public Television operates on a very tight budget with limited resources. When it came time to select a media server, they needed a cost-effective solution that gave them both operational efficiencies and the flexibility to satisfy multiple requirements.

With Omneon Spectrum™ media servers, Detroit Public TV implemented a solution that worked across their entire operation. Built around the concept of Smart Scalability™, Omneon Spectrum systems can be configured to meet precise format, channel count, bandwidth and storage specifications. What's more, Omneon Spectrum systems can then be expanded in smart, manageable increments—without replacing the original system and in many cases, without taking the system off-line.

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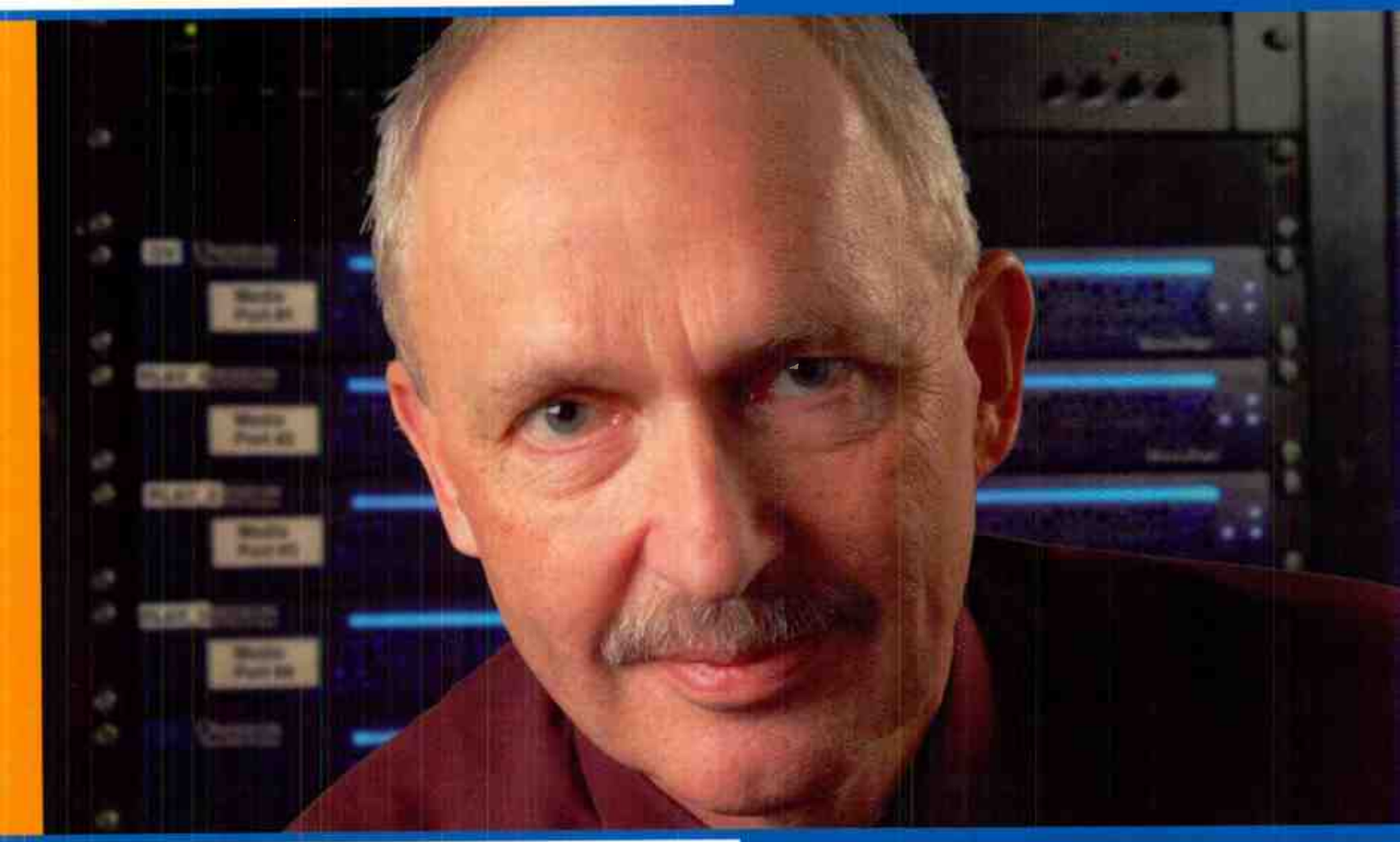

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Multichannel Automation: An Update

Centralcasting remains a hot issue for these station groups

by Craig Johnston

SEATTLE

TV station master control automation began as a one-for-one swap—one automation installation took the place of one MC operator.

But a confluence of factors such as beefier computer capabilities, intercity/state fiber optic networks, ownership consolidation, duopolies and the multichannel opportunities of digital broadcasting have led to various forms of multichannel automation.

TV Technology spoke with several automation customers about deploying such equipment in a variety of different configurations.

CLEAR CHANNEL

In 1999, when Clear Channel Communications pioneered centralcasting (controlling the program and commercial output of television stations in several TV markets from a central location) from its Syracuse station, they waded in with their New York state cluster.

"We put one station on [the automation] and we ran it in the background," said John King, regional director of engineering for Clear Channel's Northeast Station Group. "We wanted to monitor, to see where the bugs were."

Once things were running smoothly, they routed the automated feed to that station's transmitter, then gradually added a second channel, and then a third, and so forth until they were controlling the station in Syracuse, two stations in Binghamton, two in Elmira and one each in Watertown and Rochester.

King pointed out one of the advantages of being the first to attempt centralcasting was that Sundance Digital was developing its product for that application, allowing customer and vendor to work hand in glove.

"It was a good marriage where we could say 'well, we need it to do this, and this is why,' and [Sundance] would say 'oh, yeah, I see what you mean.' He would be right there writing the code to fix the different things as we went."

(L to R): Kim Stanton and Laura Rupprecht prep material for playout in WCIU's prep satellite bay.

CORDILLERA COMMUNICATIONS

Cordillera Communications uses the centralcasting concept to control Montana stations in Bozeman, Butte and Helena. "We chose Butte [as the hub] because it's geographically centered and it was the larger of the facilities," said Cordillera Chief Engineer Andy Suk.

The centralcast system is controlled with Harris automation, and is distributed through an analog microwave system. As the company looks to high definition, Suk anticipates its centralcasting model will change.

"What we don't want to do is put in large bandwidth pipes to go ahead and rebuild that microwave system itself," he said. "If you think about the traditional automation system, where you're routing massive amounts of content across large bandwidth pipes, I don't have to route the content, the content's already there."

Suk says he wants to put servers and automation systems at the individual stations, but control them from a central location. Low-bandwidth confidence monitoring will come back to the controlling location via dedicated IP channels.

WIEGAL COMMUNICATIONS

Hubbed out of its Chicago full-powered independent station, Weigel Communications controls two other Chicago channels and two South Bend, Ind. channels through DTG's automation platform.

A recent master control rebuild, with a new router, new servers and a Miranda monitor wall has allowed them to streamline the operation, with one operator monitoring the output and two manning the ingest facility next door.

Kyle Walker, director of engineering at Weigel in Chicago, pointed to the advantages of using the metadata from WCIU's fully automated Pathfire feed delivery system.

"One of the guys in the prep room spends about 90 seconds with a program," Walker said. "He skims the slate to make sure the title is really what's supposed to air tomorrow night, dou-

"If you think about the traditional automation system, where you're routing massive amounts of content across large bandwidth pipes, I don't have to route the content; the content's already there."

—Andy Suk, Cordillera Communications

blechecks all the in and out points, watches about five seconds on the front and tail end of each in and out point just makes sure Pathfinder wasn't terribly off when they timed the show."

One critical go or no-go factor in centralcasting is the cost of connecting the satellites to the hub. Walker counts himself lucky that the South Bend station he controls from Chicago is only 80 miles away.

"Putting in a digital microwave from Chicago to South Bend isn't as [big an undertaking] as markets on opposite sides of Nebraska, for example, where for reliability, we would need fiber and backup fiber," Walker said. "The cost of doing something like that may be so high that it doesn't make sense."

RAMAR COMMUNICATIONS

Ramar Communications is in the beginning phase of automating a multichannel operation out of its Lubbock, Texas facility. Today they control Lubbock's WB affiliate and Ramar's weather channel, with plans to add two regional Telemundo channels, a UPN and Fox affiliate, and the Jewelry Channel feed to local cable.

Ramar's Chief Engineer Tee Thomas said they told their automation supplier, Rushworks, that their installation would be very customized. "They wrote some very custom[ized] code for us, and turned that code around within two days, which I think is excellent."

Thomas said Ramar had to design the facility to allow the weatherman to insert weather windows into both automated channels.

"We have huge weather events here in west Texas, so when it becomes a weather event, the weatherman gets control," Thomas said.

KAET

Phoenix's public station KAET has automated control of its analog and digital SD channels, as well as its HD channel. The two SD channels run in simulcast, but because the PBS network HD feed is only done to the Eastern time zone schedule, it runs two to three hours ahead of the SD channels.

"Prior to [installing MicroFirst automation] we had an automation unit that just controlled a server and some tape machines, so the learning curve was pretty simple," said Gil Aykroyd, the station's chief engineer.

Adding the MicroFirst system was part of a master control upgrade, bringing automated control to the switcher and router. Aykroyd noted that MicroFirst personnel were on-site during the startup to make certain it went smoothly.

Each of the customers offered advice for those anticipating multichannel automation.

"Set up procedures for checks and balances, and train people from the old technology, because there's a learning curve, especially for people who have been in the business for a long time," said Clear Channel's King.

"Be sure you have enough playout sources for the multiple channels that you want to do," said KAET's Aykroyd. "More to the point, [make sure] that the automation vendor is able to provide proven drivers for that equipment." He gave MicroFirst high marks in this regard.

"The difference with automation is that rather than feeding real-time events, like you do with a master control operator, with automation you're feeding the automation in before-time events," said Ramar's Thomas.

"[With automation], everything has to be done ahead of time to make sure the event comes off, instead of running real-time where, if you miss a break, you've missed it."

Can a centralcasting hub get too big, with too many channels to control? No one's gotten there yet, but Clear Channel's King pointed to one advantage he's found with originating seven stations from a single location.

"Once you get a certain number of stations, you're pretty much running almost all of the syndicated programs, you're just running them at different times," he said. "Since the same holds true to network feeds, receiving equipment can stop scaling up with more centralcast channels." ■

Metadata

CONTINUED FROM PAGE 12

a solution—both of which have a direct financial impact on a client."

Maycock said Pro-Bel spent many hours getting its device control right.

"We identified that almost any broadcast device will go through a common sequence under automation control—preparation, cueing, playing, and freeing," he said. "This commonality allowed us to develop a common core of software for all devices which then minimizes the development and testing required to interface to new devices, and ultimately, the cost to the end customer."

The Morpheus product suite includes the M³ (Morpheus Media Management) family of open standards-compliant, PC-based applications that interface with broadcast transmission hardware, like play-out servers. Leveraging a relational database, M³ provides automated caching, material ingest, archiving, browsing, and quality control.

"Pro-Bel media management holds metadata that tracks the location of every copy of every piece of media. There is a suite of 'transfer agents' [or applications] that can move content around a broadcast infrastructure based on demand," said Maycock. "If media is requested to be in a certain location at a certain time, the transfer agents automatically create and execute a workflow to satisfy that request." Morpheus automation has been installed at Turner Entertainment Network International Ltd in London, as well as TV Guide Networks in Los Angeles.

Harris Corp. is integrating its digital asset management, air-time sales, scheduling and reporting solutions within its new H-Class Content Delivery Platform, which includes H-Class Play-out Automation, H-Class Media Ingest, and H-Class Intelligent Transport. The new H-Class solutions will improve content management and sharing, and intra-application messaging, for reduced operational and infrastructure costs.

"Our metadata approach builds on existing industry standards by enhancing metadata at the transactional layer. This enables our systems to intelligently capture and extract usage information to improve commercial placement, digital rights management, and other content-related activities," said Ben Peake, director of product management for Harris Software Systems, in San Jose, Calif.

"Metadata enables intelligent broadcast automation systems to make critical decisions about what content to play-out to air, as well as how to manage the movement, access, and delivery of that valuable media from ingest to play-out and delivery, and ultimately to archive," Peake said. "This approach ensures 'the four rights'—the right content to the right person at the right time on the right device—and becomes the mechanism by which content transactions can be monitored and measured."

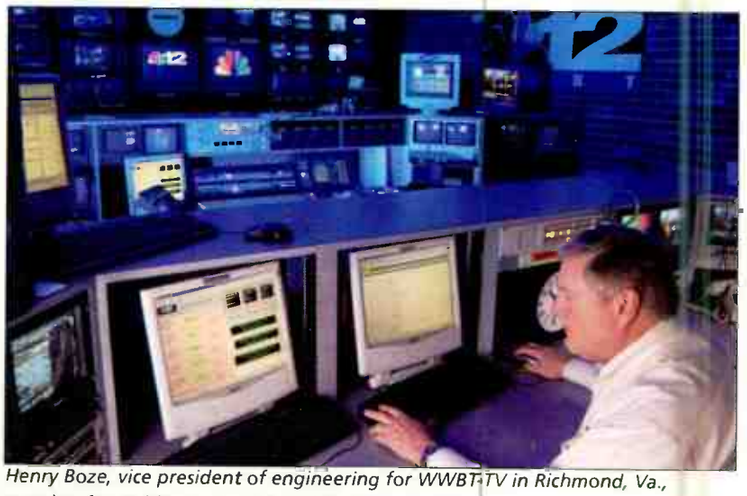
Crispin Corp. has enhanced the Archive Manager feature that integrates hierarchical RAID-protected storage management within its System 2000 broadcast automation suite.

"In our system architecture, we capture and preserve all metadata associated with an asset, and access it via the manufacturer's communication protocol. We also add attributes or metadata that assist in managing such assets, including dubbing, copying to a mirrored server, archiving to our nearline storage, restoring from the nearline storage to the play-to-air server, and deleting the asset from the system once it's expired," said Alan DeVaney, president of Crispin Corp. in Durham, N.C.

"Crispin also uses metadata to assist our system with identifying and verifying that the clip or material we are about to play-to-air is the accurate material."

With its tight integration with traffic systems, Crispin's System 2000 takes instructions from traffic, locates the material, and moves it from the cache, third-party content delivery systems, tape, offline or nearline storage systems to the primary and back-up play-to-air schedule and execute it to the play-to-air servers.

"We then take the traffic on-air schedule and execute it with precision, controlling the various devices, such as video servers, switchers, routers, tape machines and branding devices, in a synchronized frame-accurate fashion," DeVaney said. ■



Henry Boze, vice president of engineering for WWBT-TV in Richmond, Va., searches for archived video using Crispin's NewsCat.

Finding Media Assets in a Pinch

To manage the growing volume of media assets and metadata filling up their servers, broadcasters are increasingly turning to digital asset management solutions, such as Front Porch Digital. With more than 110 installations in over 40 countries, Front Porch Digital—which recently received a U.S. Patent for its archive management technology for broadcast facilities—has proven integration with all major automation products.

At NAB2006, Front Porch Digital will show the latest products in its modular asset management solution, including DIVAdirector, a distributed, Web-based, content management application for tracking all assets in its companion product, the DIVArchive system.

DIVArchive, now in version 5.8, offers data management and transcoding specifically designed for large, complex broadcast workflows. It offers low-bitrate proxy browse, frame-accurate EDL generation and export, and robust metadata search and management capabilities. DIVArchive operates under the control of automation to identify specified files, locate them on connected storage devices, and move them to the appropriate components, as required by workflow from ingest to play-out.

"The quantity and quality of metadata regarding an asset is directly tied to its swift identification on the broadest search parameters," said Mike Knaisch, president of Front Porch Digital, whose customers include Denver-based Comcast, New York-based Rainbow Media, and Chum TV, in Toronto.

"The better the metadata, the faster an asset can be accessed, edited, and readied for air. The gain in time to market is a key competitive advantage, particularly in the newsroom," Knaisch said. "The quality and quantity of metadata input will dictate the accessibility and ultimate value of the asset."

Claudia Kienzle

Frank Graybill,
WNET, New York

Frank Graybill is Choosey...

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Broadcasters Heed Closed Caption Call

Encoder sales spike, captioning services add staff to meet broadcaster demands

by James E. O'Neal

WASHINGTON

The fanfare and fireworks that marked the close to 2005 also signaled the beginning of another era in U.S. television, the beginning of mandatory 24/7 closed captioning. More than two months have passed since broadcasters were obligated to keep Line 21 fully employed. How successful have stations been in complying with this ancillary service demand?

The FCC has been strict about compliance with the rule. While there are some exceptions, they do not apply to the majority of broadcast content. The commission is willing to consider petitions from stations and groups claiming that the captioning rule creates an "undue burden" and who wish to be exempted from full-time captioning.

An FCC spokesperson said that 430 requests for exemptions and extensions from the closed caption rules are currently on file at the commission.

"About 250 of these were received after January 1, 2006," the spokesperson said. "The petitions are currently under review."

There is a 30-day public comment period for the petitions and a 20-day reply period. The FCC is allowing petitioners to continue to transmit uncaptioned material.

"Unlike in other contexts, the commission's rules provide that, in the closed captioning context, during the pendency of an undue burden petition, then video programming subject to the request for exemption shall be considered exempt from the closed captioning requirements," the spokesperson said.

Petitions and "undue burdens" notwithstanding, the show must go on, and most broadcasters have done their best to stay legal. Manufacturers of closed-captioning encoders and captioning service providers have been busy.

EQUIPMENT ORDERS

According to Sidney Hoffman, project manager and co-founder of Rockville, Md.-based Computer Prompting & Caption-ing Co., the FCC edict was very good for business.

"We saw a dramatic increase in sales in December," Hoffman said. "What I thought would happen actually occurred and we were able to keep up with it. As we make the only software encoder system, we were able to keep up with demand."

Hoffman explained that even after the December boom, business still has not tapered off to normal levels.

"Some people decided at the last minute to use a service to be compliant, but are now purchasing a system so that they can do it in house. They initially figured, 'our back's up against the wall, let's play it safe and use a service.' Now the same people are buying systems. They're finding out that doing captioning is not complicated black magic and they don't need to spend weeks figuring out how to do it."

Bob Henson, president of Link Electronics in Cape Girardeau, Mo., also reported that business was good.

"We saw an increase of 40 percent in closed captioning products. It began to pick up about the first of December. We had to put people on overtime to keep up. We're still getting orders, with January very strong and continuing on into February," Henson said.

He also observed that a large percentage of captioning equipment has been going to post-production houses and churches and that most orders were for analog equipment.

Amy Bowlen, manager of real-time captioning training, at work at Vitac's Canonsburg, Pa. facility.

Bert Verwey, president of Broadcast Video Systems Corp. in Markham, Ontario noted a similar pattern in equipment orders.

"It's been quite good for business and we're still doing a big business in analog. The orders are still split about 50/50 analog and SDI. Of course, this means we'll have repeat business when the customers do go digital," Verwey said.

He noted that a lot of his business has been in sales of his company's "bridge and repositioner" equipment for dynamically relocating captioning on the screen.

"A lot of customers are buying this to meet the requirement to get the captioning away from the EAS crawl," he said.

CAPTIONING PROVIDERS

Commercial captioning services have also seen a sharp rise in business.

Heather York, marketing manager and account executive for Pittsburgh-based Vitac, said that she has seen business nearly double at her company.

"We did 50,000 hours of captioning in 2005. Based on projections for business done so far in 2006, it looks as if we'll do around 95,000 hours this year," she said. "We had to double our staff in the fourth quarter of last year. I guess a lot of people didn't know that the rules were changing until December."

That resulted in a big last minute rush at Vitac.

"The Friday before New Year's, we got over 40 calls from people requesting captioning by that Sunday. We had to turn a lot of them away. To caption one hour of programming takes about eight hours. Our people worked an enormous amount of overtime," York said. "We're still getting calls from

people turned away by other captioning services."

She added that the company is hiring captioners, but that finding personnel who are proficient doesn't happen instantly.

"We're looking for highly trained and qualified people. There's already a big shortage in the industry, with all the work associated with courtroom reporting. We made a big effort to round up as many qualified people as possible before the deadline," she said.

York observed that securing qualified captioners has gotten increasingly more difficult, and she attributes some of this to the popularity of computers and Instant Messaging among younger people.

"Back around 1992, the pass rate on our qualifying exam was around 70 percent. Now it's down to around 30 percent. The kids wanting to come into the business are just too used to taking Instant Messaging language shortcuts."

John Spires, vice president of business at TM Systems in Los Angeles also reported getting a large volume of calls beginning in December. Inquiries weren't just from broadcasters either.

"We've been hearing from people wanting to caption cable TV content. Also a large number are interested in captioning library and archival material even though the requirement doesn't touch anything produced before January of 1998," Spires said. "A lot of requests are coming in for Spanish-language work. There are around 41 million Spanish-speaking people in the U.S. They've been virtually ignored. A lot of English language shows are going into Spanish with closed captioning—also English language commercials."

Spires said that his company had to upgrade some of its equipment to keep up with demand.

Anthony DeMarco, sales and account executive at the National Captioning Institute observed the same pattern.

"A lot of people bombarded us at the end of the year. It definitely affected some of our delivery turnarounds and required us to add staff. We were able to accommodate all of the business, but it was difficult, especially with people being on leave for the holidays," DeMarco said. "We picked up a lot of new clients."

DeMarco said getting qualified people on board and trained was a big challenge for his company and noted that business hasn't really leveled off either.

"We're seeing a lot of business from the churches. They don't have large budgets and are very price conscious. We're doing all that we can to help them," he said. "We're also getting a lot of business from the sports side of things—especially college basketball. Public TV is also calling on us. They were expecting that programs under 10 minutes would be exempted. They're finding out that their pledge breaks do have to be captioned. This has to be done live and a captioner has to be on standby the whole pledge period time to handle the breaks."

DeMarco said that NCI was still working to achieve better results with voice recognition captioning systems, and that this was a full time project for some staff members. He said that over the past months, the accuracy has gotten a lot better and that NCI may try to "go live" with the technology sometime in the future.

IMPACT ON BROADCASTERS

Dale Cassidy, chief engineer at KTBS-TV in Shreveport, La., says his station was ready for the captioning mandate.

"KTBS has been fully compliant from the start. We got a jump on it last year with our local news. We're using Avid's iNEWS system and this has allowed us to handle non-scripted actualities such as remote news feeds or weather ad-libs by 'going live' and keying in the dialog as it happens," he said. "We bought Link PDP-886 encoding equipment and Autoscript software to interface with iNEWS and we're looking into voice recognition, but haven't found a product that will give us enough of the true rendering, so we're waiting until the technology gets better."

Cassidy said that aside from the initial outlay for equipment, captioning hasn't had a big impact on the station's operating expenses. That could change, however

"I know that if we get into more live programming, we are going to have to hire a stenotypist or purchase voice-recognition equipment," he said.

KTBS was involved in one project with a local talent group that required some behind-the-scenes work to maintain compliance with the captioning rule.

"We ended up bringing all the tapes back to the station, playing them and typing the dialog into our iNEWS script file so that we could do the captioning. It worked," he said.

Cassidy noted that the station broadcasts services and programming from more than 10 area churches and that these broadcasts have been able to continue after the captioning rule and that some were experimenting with voice recognition to keep costs reasonable.

He also reported that the station had received no comments or complaints from the hearing impaired community.

"I guess that's a good sign," he said. "In the past, if we had a failure during a program, we would definitely get calls." ■

Rochester Responders Tuning in Datacasts

Pubcaster WXXI, Triveni build emergency info system

by Sanjay Talwani

ROCHESTER, N.Y.

One night about two years ago, Lt. Dan Bender of the Rochester (N.Y.) Fire Department, was watching HBO on-demand, and got an idea.

What if the city and county's emergency and public health and safety squads had a similar kind of on-demand menu of training programs, weather updates, daily schedules and, when needed, information on an emergency in progress? And what if 100 offices and agencies in Rochester and Monroe County, N.Y., could access all this continually updated content using that most familiar of man's tools, the remote control?

Since his on-demand epiphany, Bender has been awarded a hefty federal grant, acquired a Triveni Digital SkyScraper datacasting system, and a couple of extra megabits-per-second on the public airwaves of WXXI-DT, the local PBS DTV station. He's also managed to sell the program, the Emergency Training and Information Network (ETIN), to his local emergency response crews—including about 39 fire departments in the largely rural county. And the system is so easy to use, he said, that it's "fireman-proof."

Bender's project at WXXI is another example of public television stations that are using new digital broadcast technologies for public safety and emergency response, even as Congress considers legislation to revise the data of analog shut-off reassign frequencies to public safety needs.

Broadcasters say the Rochester project shows the broadcast infrastructure itself can be a backbone of widely varied, advanced, rich-media public services of the future.

At presstime, the WXXI project was on the verge of launching, linking police and fire departments, hospitals, and more with a continuous daily stream of safety and training content, plus special emergency functions, controlled by remotes and viewed on 32-inch LCD screens.

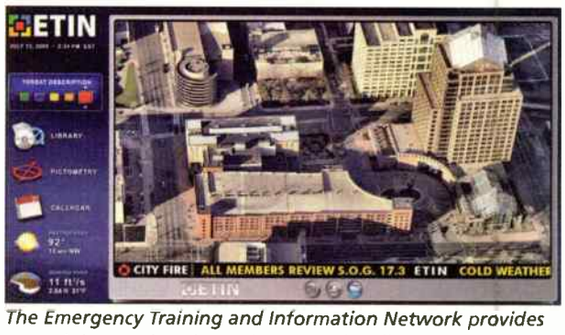
"What it came down to is, 'how do we consolidate all this content and deliver it over a single pipe, so to speak, to a dedicated location like a firehouse, like a police station, like a hospital, without creating too much overhead at the recipient site?'" said Ralph Bachofen, director of product management for Triveni Digital in Princeton Junction, N.J.

Initially, Bender brought his idea to the local cable operator, Time Warner Cable, who showed little interest, he said. But then he met with folks at WXXI, and found a more receptive audience. He then found a Department of Homeland Security grant—a "Special Projects Grant" in a part of DHS called the Metropolitan Medical Response Program—whose aims closely matched what Bender wanted to do. Of the 170 cities that were eligible to apply for the grant, 50 applied and Rochester was awarded the top grant, $641,480, in late 2004.

The project uses the SkyScraper DataFab component to ingest content from various sources as program operators for ETIN's six different channels (police, fire, hospital, etc.) drag and drop files into appropriate folders. The SkyScraper DataHub component allocates appropriate bandwidth for the content and integrates it into the DTV data stream.

Around the region, a DataReceiver card in a single computer at each location captures the data and can store it for use in that location's local intranet and for display on one of the LCD screens.

It may be the bleeding edge of public safety datacasting technology, but Bender kept in mind that his firefighters weren't all that crazy about computers and sometimes handle their equipment a little roughly. But everyone can manage a remote control, and the TV is on nonstop in many firehouses.



The Emergency Training and Information Network provides several datacasting channels targeted to first responders.

Bachofen agreed. "You don't have to do anything on the client side, which is really important because some of the folks on the client side might not be technical people," he said. "It has to be simple on the client side."

THREE MODES

It doesn't get much simpler than the most basic of the three modes in Rochester's ETIN. The "automatic" mode essentially sends non-critical information—training videos, safety reminders, and timely updates such as weather reports and staffing notes—to the client for display in a continuous loop. The idea is that firefighters will see some of the short clips—on effective CPR, or a particular rescue technique—enough times that they will absorb the knowledge. This mode also includes an information crawl at the bottom of the screen. As Bender puts it, it's pretty much like watching television, and it could include some fun

features, like trivia and quizzes, to help keep viewers interested.

The second mode is an on-demand world, where a local station can pull down timely information—instructions on how to deal with a particular event, for example, or a needed training course. Since firefighters tend to be leaving the station frequently without notice, the on-demand model works well for them.

The third, emergency mode, would override the other modes on all receivers so everyone is literally on the same page. And responders heading to the scene of the emergency would have the appropriate maps or other crucial data.

Bender beat the pavement to win local support. "One of the big sells was to tie in all the agencies together, have this interoperability," he said. "We had to go out and we took the show on the road. We went to chiefs, their monthly meetings, and we showed them what we had: 'We're going to purchase this for you, we're going to install it for you, it's basically a plug-and-play.'"

For WXXI's initial ETIN launch, Bender will begin with about 20 sites (mostly Rochester Fire Department locations), iron out bugs, and expand to the other 80 or so sites across a 75-mile radius. Other agencies, including the state police and neighboring Livingston County, have expressed interest in joining up as well.

The cost, said Bachofen, runs roughly $2,000 to $3,000 per receiver, depending on features, and the SkyScraper backbone runs around $12,000 to $15,000.

Looking ahead, Bender is interested in using WiMax technology for backchannel communication. In addition to being able to have two-way communications, Bender wonders, wouldn't it be great to be able to shoot a scene on video and stream it right back to the hub for retransmission to other emergency responders?

The project is far from the first program to use public TV's resources for public safety needs.

WNET in New York has demonstrated, along with the Fire Department of New York, a system of "Smart Nets," including two-way WiMax mobile communications, over the station's Educational Broadband Service (EBS) frequencies around 2.5 GHz, formerly known as the Instructional Television Fixed Service Band. Unlike DTV datacasting, which generally blasts out 8-VSB signals one-way, broadcasters are allowed to modulate their EBS signal in different ways, such as WiMax's mobile two-way 802.16e flavor.

The WNET focus is on front-line responders like police and fire units. "They, for their communications needs, require, number one, mobility and, number two, two-way communications," said Stephen Carroll-Cahnmann, director of Digital Convergence for WNET.

He said the demonstration and research project, now in its "end game" has been enormously successful in showing the viability of WiMax technology over EBS to serve public safety needs.

"Our argument has been, there's these frequencies in the hands of public stations who are dying to sit down with public safety," he said. "There's some new technology, and public stations are at the forefront of pushing through this model."

Los Angeles public station KLCS is datacasting to 25 high schools and eight middle schools, reaching about 40 percent of the of the high schools in the city. These schools have access to high-bit-rate streaming channels (1 Mbps each) over the air with near-video-on-demand on every computer in each school, according to Alan Popkin, director of TV engineering and technical operations at KCLS.

And datacasts could increase rapidly in the future. Triveni Digital says SkyScraper technology is already deployed in public stations reaching half of all viewers in the country. ■

NATPE Explores the World of IPTV

Confab explores new ways technology affects syndication market

by Campbell Collins

LAS VEGAS

While attending the 2006 National Association of Television Programming Executives convention one had to ask... Is NATPE still about program syndication? On the floor and in the hotel suites it was business as usual for the program suppliers (especially for the newly independent former UPN and WB affiliates) but in the panel sessions, technology was the keynote.

Though the confab was a ghost of its previous gatherings, it was also a harbinger for tomorrow's digital content possibilities. Fully half of the scheduled expert panels dealt with the newest confluence in digital content. Topics and inspiring examples of creative and experimental projects in delivering video to new, more accessible media were abundant.

Does that mean that sales (licensing) of video production to cell phone, VOD, IPTV and other media will be the next revenue windfall for content owners? Not according to Josh Bernoff of Forrester Research who fronted a panel titled "Big Screen? Small Screen? What About the New Screens?" Bernoff unveiled statistics on how and why broadband video, also known as IPTV, can monetize content *now*.

The session leader backed his position with a gaggle of well-documented statistics: a) in broadband there are currently 500 million users worldwide and, b) broadband has the pieces in place to collect revenue.

CBS New Digital Media Chief, Larry Kramer concurred in the "Digital Strategies: Evolve and Prosper" panel, noting that the surprise in digital media this year was that revenue for TV programs bought for mobile viewing was way ahead of schedule.

CBS OFFERS NCAA GAMES

Kramer noted that CBS is making all of its NCAA games available in an ad-supported, online archive so anyone wanting to catch up on a missed event can see it for free.

"To be successful it has to be free," Kramer said.

Content deals were truly the talk of the town, such as the announcement from Amazon.com that the Web site will be producing and Webcasting a talk show with topical funnyman, Bill Maher.

NATPE '06, held at the Mandalay Bay in Las Vegas, saw its usual flurry of syndication deals.

Other interesting projects discussed in panels and meeting rooms included the creation of an online community by NBC Digital around its hit show "The Biggest Loser." NBC Digital offers goal appropriate weight-loss recommendations and then sells those diet plans to its faithful 33,000 regular subscribers at $20 a month. Not only is this making money now, it is also "brand-extending" according to division chief and panelist Jeff Gaspin.

Ross Levinshon, president of Fox Interactive Media, discussed the company's newest Web property, the late night talk show hosted by Stewie from "The Family Guy." The program, developed exclusively for online (and mobile) devices, will be based on *www.familyguy.com* and according to Levinshon, is perfect for the young demographics of the online audience.

According to U-Turn Media Group of Denver, which was at the show to demonstrate its technology to port video to mobile devices, the first step for any content creator to repurpose their content for cell phones, iPods and the like is to encode or digitize the video and and format it into one or many of the compressed non-broadcast codecs such as Windows Media Video, supported in Windows Media Player, RealNetworks RealPlayer or Apple QuickTime. Compression codecs such as 3GP (a compression standard for 3G-based cell phones) or H.263 (a codec designed for videoconferencing) could be chosen for formatting video for mobile screens.

If diving head first into the tiny screen world is either too head-spinning or too time-consuming, companies like U-Turn will not only help client content owners like WISC in Madison, Wis., KGTV in San Diego and KXLY in Spokane through the process, but will license a software bundle to assist in managing the content. Features include editing, uploading and branding as well as enabling end-user interaction, streaming video simultaneously with live video and reporting to advertisers.

Is prioritizing one's content delivery rollout becoming as important as producing video for alternative screen sizes and formats? Probably not if you are an all-formats-at-once producer like Mark Cuban. It sure sounds easier though, especially on the marketing budget. ■

Hoop

CONTINUED FROM PAGE 8

as is a 1.3 megapixel camera with flash, a camcorder, MP3/AAC music player and 3D graphics.

"We had quite a lot of input into it," said Jha, "you can see what's going on in the world of sports even when the phone is closed" via the ticker on the secondary display. ESPN also insisted on custom fonts for the QVGA screen, certain Java extensions and other items.

Jha was tight-lipped about the features that might be debuted at the NCAA playoffs. But he noted that applications that take advantage of the GPS chips now resident in most cell phones "are just beginning to come to market—that's one of the things we're working on."

A year ago, DirecTV upgraded its set-tops with software from sister company NDS to provide HTML and JavaScript applications and multiple feeds, resulting in new amenities to theme-based program guides and packages. DirecTV's first upgraded sports offering was last fall's "NFL Sunday Ticket."

Its newest mix channel, "Mega March Madness," lets customers who have interactive remote controls (and pay $59 for viewing rights) to view up to six real-time games on one screen. A "Bracket Tracker" on-screen overlay lets viewers input their own bracket predictions and track their progress against reality as March Madness unfolds. ■

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DIGITAL JOURNAL

Bill Hayes

HD Editing, in Fits and Starts

Despite progress, workflow issues remain

JOHNSTON, IOWA

Long before IPTV began broadcasting in high definition, we were actively involved in the acquisition of high-definition content.

As early as 1998, we began shooting HD for special events like the Iowa State Fair. Several years later we produced our first HD program, a documentary on the restoration and remodeling of the Iowa State Capitol building. Although IPTV personnel shot the footage for this production, the actual HD editing had to be done off-site at a post house in Chicago because we had not yet purchased any HD editing.

In 1999, when we were working on this project, there were so few nonlinear HD editing options available that met our performance requirements—and were in a price range we could afford—that we seriously looked at converting our existing analog linear suite to HD and using our reliable GVG 341 editor as our primary HD editing facility. The only thing that kept us from moving down that road was the lack of a suitable HD switcher that could take the place of the GVG 110.

The only nonlinear options that we could seriously consider based on performance were the Discreet Smoke and the Avid DS/HD. At the time we first started looking at the DS system it was not an Avid product, but rather an offering from Softimage, a company that Avid acquired. We had, in essence, cobbled together a small HD editing system based on some unauthorized upgrades to an early Final Cut Pro system, but the editing performance of that generation of FCP was intolerable for long-form programming. Also, there were so many problems associated with the bargain-basement hardware that we had used that FCP wasn't a serious consideration.

There were two critical factors that lead to our decision to purchase the DS/HD. The first was the price: For about half the cost of what was quoted for an equivalent Smoke system we were able to purchase the DS/HD as well as upgrade two of our SD Avids to Meridian.

The second factor was compatibility—certainly not essence file compatibility, which has never been a strong suit for Avid, but edit decision list compatibility. Since we knew that we would be doing a large amount of HD work using our SD Avid systems, it was crucial that we have the ability to create the basic product in down-converted SD from the HD masters, then take the EDL and the HD masters into the HD system, conform the EDL and ingest and create the finished product. The DS/HD was approximately 98 percent accurate in the conforming process whereas the Smoke was in the 75 percent range. Given what I know now, I suspect that EDL conforming accuracy was probably one of the key issues that the Avid software engineers focused on with the Softimage DS purchase.

CONVERTING TO HD

Now move forward to the present where IPTV is doing the vast majority of our field production in HD. At this year's NAB, our team will be doing the final work on creating request for proposals for the conversion of our studio to HD. Workflow has become one of the key discussion points in the industry, and of course, as with all things digital, there are brand new emerging technologies like Blu-ray and flash storage, which promise to revolutionize the way we work. With those drivers and others, the push at our facility has been to update, upgrade and increase our capacity for doing HD production. During this period of time, improvements have been made in the systems we initially considered. Additionally, our local staffs have made decisions that impact our workflow.

Our promotions department now produces interstitials in HD using their system of choice, FCP HD. Meanwhile, programming and production have stuck to their guns and are unwilling to change from Avid. On-air playback of content is via Omneon servers which have their own unique needs and limitations when it comes to HD. So when considering a solution that in theory is supposed to improve workflow, it is critical to have the players involved look beyond the barriers of their own area to how they fit within the overall station system. An example is our recent purchase of Avid upgrades.

When our production department first began working with Avid on what was needed, the proposed equipment list only had the upgrades for the existing Media Composer Meridian systems and a new Media Composer Adrenaline. Evidently the Avid workflow upgrade proposal doesn't provide a path for our existing DS/HD system that doesn't require a forklift. It wasn't until we all sat down to go over the proposal with the Avid representatives that we were able to get a plan put together that recognized that we wanted to do more than move files between our Avid systems; eventually the content created on these systems has to make it on the air and into our archives. I suspect there might also be a time when the promotions department may want to use some of the content in creating interstitials. As you may suspect, these requirements resulted in a considerable change in the hardware and software inventory from what was originally proposed as a fiber switch and shared storage between our two existing Meridians and the new Adrenaline.

In addition to the upgrades to the existing Meridiens and the new Adrenaline, the original Avid proposal included two Avid MEDIArray ZX's and a Q-Logic 16-port 4 GB Fibre Switch. The final proposal plan added an Avid Media Manager, File Manager and Transfer Manager to the package which allow us to connect the existing DS/HD system as well as the hooks necessary to connect the Avid environment to the IPTV house network. For me, often the hard part of this is just figuring out what all the parts do and how they fit in the system. It appears to me that MediaManager, FileManager, and TransferManager are all software packages that run on dedicated servers. MediaManager tracks all the "Avid" media assets stored on the MEDIArray storage. In theory it can also track non-Avid assets files that are related to an Avid based production. Our system has

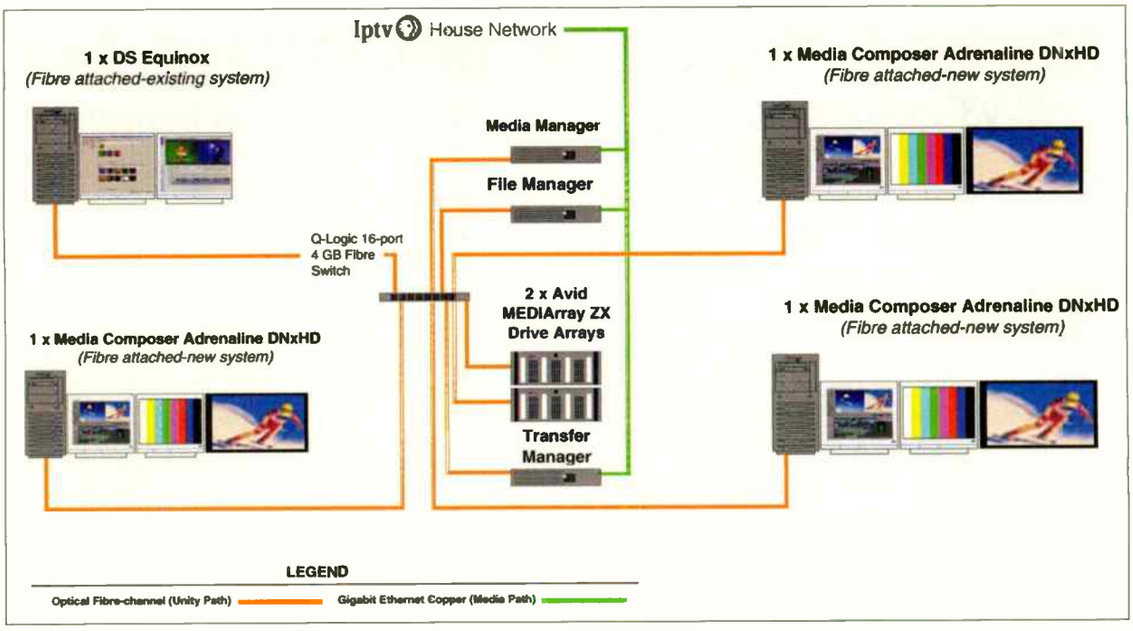
yet to be commissioned so I haven't seen how that works. The addition of the MediaSelect option allows desktops attached to the Avid via the LAN to browse assets. What I am still unclear about is if this browse option is strictly for the Avid storage or can the desktops also browse attached non-Avid systems such as the Omneon storage and Spectra Logic archives. During our meeting with Avid to discuss equipment needs, integration and configuration, they were unable to answer this question but offered to check it out and get back to us. So far, we haven't heard back regarding this question.

According to the documentation, TransferManager facilitates the movement of files between the shared storage and the attached editing systems. As I understand it, to work with files from the shared storage, the data still has to be moved from the shared storage to the local system storage for editing. TransferManager speeds up this process by providing a dedicated server to handle the processing and allowing the processor on the editor to focus on just manipulating the content. The process can take place on the TransferManager at faster than real-time speeds. In our application the system will perform a similar function for moving completed content to and from the Spectra Logic archive.

The final piece is the FileManager, which is still a bit of a mystery for me. At first blush it appears to be a software-based transcoder similar to the FlipFactory, in which case Avid content is sent to it and transcoded to the appropriate format for use on other systems such as our Omneon and FCP systems. However, I also know that there is a FileManager plug-in available for the FlipFactory, so I assume that if you own FlipFactory, you can just purchase the plug-in, but it may entail some upgrade to the FlipFactory.

As much as I would like to report how well all of this is working, since our system isn't commissioned yet, I don't have any real world results. One observation that I will make is that I am becoming increasingly more skeptical about buying systems that you plan on expanding. Three or four years from now, I doubt that the technology that we are implementing will be compatible with new technology being rolled out. So keep the existing systems operational until the forklifts arrive and remember that in the digital age as in every other age, the things that revolutionize our workflow are the same things that can disrupt our world. ■

Bill Hayes is the director of engineering for Iowa Public Television.



IPTV's proposed HD editing workflow

Routing Video: A Balancing Act

SMPTE/VSF panel debates latest developments in video transport

by Robin Berger

HOLLYWOOD, CALIF.

When it comes to dealing with the challenges of routing video into, around and out of a television plant, TV networks vary markedly in their tales of dealing with the beast—or so it seemed at a user panel discussion hosted by SMPTE and the Video Services Forum last month.

For the second year, VSF, an international association of service providers, users and manufacturers of video transport technologies, co-hosted its annual VidTrans update on video transport services along with the SMPTE Motion Imaging Conference with the goal of highlighting the connection between the two operations.

The forum was also an opportunity to vent on some irksome issues and explore possible remedies to these problems. Those voiced by the user panel were familiar: trying to push the envelope while hamstrung by budgets, costs, legacy equipment, and mindsets both in-house and outside the panelists' respective operations.

HD: PRO AND CON

Fox was the most upbeat. According to Richard Friedel, executive vice president and general manager for engineering and operations at Fox Networks, things were rosy regarding the generation of high-definition products, IPTV and IP transmission.

"We're in the catbird seat—we've migrated much of our stuff to IP techniques [and] we're going toward data circuits," Friedel said. And the network, which initially balked at high definition, now regards HD as routine.

"Costs are up maybe 15 percent," he said. "It takes us virtually no more manpower now. The products and equipment are there. We're not doing anything that's not HD now."

At the other end of the spectrum was Paxson.

"We did a lot of testing and determined [HD] was very expensive," said Paul Atwell, director of video networking, Paxson Communications Corp. "We decided it was better to work with multicasting," he said, later noting that IPTV "could also be profitable for broadcasters."

Reports from three other networks fell somewhere in between.

For ABC TV Network's Rich Wolf, who helms the telecommunications and network origination services division, the biggest challenges were balancing acts. In addition to accommodating expectations with legacy equipment "still routing baseband analog," he has had to weigh changing markets against prevailing policy and clients.

"It's not just a capital issue; it's a people training issue," Wolf noted. "We know that [things] will change in the next 12 months [but] you have to be loyal to your paycheck."

Change may already be afoot. Wolf noted that the folks "paying the bills" just anted up for "an incredible amount of HD commercials."

There's a similar balancing act at sister network ESPN.

"We're trying to cut down on costs so that we can broadcast more events in HD," said Emory Strilkauskas, manager of transmission contribution services for ESPN. Regarding IPTV, another area where contributions are expected to rise, he said, "We're going to go wherever the technologies dictate—we try to repurpose content."

At Turner Entertainment Networks, Merrick Ackermans, director of engineering, network operations, said HD was "a whole lotta work," due to simultaneous feeds. "But we want to keep the high-end viewer," he noted.

Ackermans had a similar take on IPTV.

"It's about choice and it's about ease," he said. If IPTV provides both to the consumer, "we may have tens of thousands of unique channels—the amount of content would go up exponentially," he said.

Ackermans also noted, as did others, that what's produced at the plant is often not what's available to viewers, thanks to third parties, such as cable TV providers.

"It's not just about what we do but what all these other systems do to muck it up," echoed ABC's Wolf.

HDTV and set-top box manufacturers annoyed Fox's Friedel.

"Virtually every manufacturer overscans, over-scales," he said. "The $1 chip in the set is screwing up the picture."

Carriers were also seen as problematic.

"Most carriers are constrained by tariffs and other regulatory issues," Friedel said. "We have not done any dark-fiber work ourselves today—we've been using third parties—[but] have been looking into doing so with our test facilities."

Strilkauskas said that ESPN was also looking to do more over fiber versus satellite, noting, "If we can't meet that fair price, we'll do it ourselves."

MEDIA TRANSPORT

During the panel discussion ABC's Wolf said, "IP should be an enabler—something that can drive down the cost of backhaul." After the conference, he elaborated on ABC News One's Digital Media Gateway (developed by Pathfire and installed in 2002) and the Bureau Net file transfer system (installed within the past 12 to 18 months).

Bureau Net and DMG, said Wolf, are examples of how "we collect or distribute content in a much more efficient way in large part through some IP protocols and the use of file servers."

For real-time delivery, he said MPLS (Multiprotocol Label Switching) networks carried content effectively over the Vyvx backbone. For Wolf this protocol has two advantages—it fits into ABC's new digital workflow and it ultimately will lower transport costs. Vyvx transported ABC's "mission critical" high-definition content for the Super Bowl.

Strilkauskas, who is responsible for getting feeds from events to ESPN's Bristol, Conn., headquarters was in complete agreement about the need to make HD backhaul cheaper.

"On a good day, encoders roughly list for $60,000 and then you need backup," he said. "When all is said and done, it's a quarter of a million dollars for every event, including encoding, decoding and quality control."

For Strilkauskas, the biggest breakthrough has been JPEG2000 opportunities afforded by fiber. The 270 Mbps infrastructure delivers high-quality feeds at a lower cost than satellite's MPEG-2 options and provides "a lot more bandwidth," he said.

Further reducing costs from venue to broadcast center, Vyvx announced its "HD Encoding Services" option last month, which would provide Tandberg Television encoders (5782) and decoders (2182) at the sports venues, as well as tech support.

Fox's Friedel told **TV Technology** that his network was "using IP techniques as we find appropriate places." A good example is the Private Line Network, which, Friedel said, "moves video between our sports facilities around the country." It was converted from an ATM format to IP last year. ■

Debates

CONTINUED FROM PAGE 1

function where he also called for the FCC to expedite a media ownership ruling. He came out against the cross-ownership rule that prohibits a TV station from owning a newspaper in the same market, for which Scripps, Tribune, Media General and Gannett have fought. Upton also opposed the local radio ownership cap, but said nothing about a similar restriction on local TV station ownership that has Sinclair, LIN TV and Pappas in limbo.

Media ownership rules have been thrown out by two courts in five years, leaving Wall Street ever more disenchanted with the sector. Affected companies want the matter settled, and David Rehr, the new NAB chief, wasted no time getting down to it. Rehr fired off a four-page letter to FCC Chairman Kevin Martin arguing against cross-ownership and the local TV cap.

Martin has talked about doing individual ownership rulings, but not without a full commission. The FCC's been firing on fewer than five commissioners since Martin took over nearly a year ago. Robert McDowell, who would be the fifth, was awaiting confirmation at press time.

Even without a set of five, Martin managed to shake things up in the video world with a revised report on a la carte cable channel pricing. At his behest, the FCC Media Bureau reinterpreted a 2004 study that concluded a la carte pricing would be more expensive than the tiers or channel packages currently offered by cable. The revised report, released in February, said individually priced cable channels would be 3 to 13 percent cheaper.

70/70 TEST

To make matters worse for the cable lobby, the report came in the midst of the telcoTV press to circumvent local franchising, and the annual FCC video competition report that raised questions about the "70/70 test." That's when cable systems with 36 or more channels are available to 70 percent of U.S. households, and 70 percent of those households subscribe to them. At that point, communications law instructs the FCC to "promulgate any additional rules necessary to promote diversity of information sources." The FCC opened 70/70 up to public comment.

The National Cable and Telecommunications Association, in its response to the a la carte report, also lobbed a round at 70/70, saying individual channel pricing would kill startup networks, many of which serve minorities.

Sen. Ted Stevens, (R-Alaska), chairman of the Senate Commerce Committee, issued a measured response to the general shelling between the FCC and the cable lobby.

"If a la carte is not more expensive for consumers, I will support an effort to take such an approach," he said, "subject to discussions with providers on the downside of such a process."

The broadcast lobby has remained mum on the subject of a la carte and what it might mean to must-carry and retransmission. The NAB instead put its energy into refuting a study asserting broadcasters ought to pay cable operators for carriage.

In a letter to lawmakers, Rehr said the study was "so riddled with flaws that it has no place in any meaningful discussion about the retransmission consent marketplace."

Rehr, who took over the presidency of the NAB two months ago, will oversee his first NAB convention this year in April in Las Vegas. Unlike years past, the chief broadcast lobbyist may not get a lot of face time with politicians at the event.

Upton was one of seven members of Congress who showed last for the traditional Congressional Breakfast. He said it would be unlikely for members to show up this year because of the uproar surrounding lobby swag. The NAB typically pays travel and lodging for panelists, but lawmakers are under the gun for accepting gifts from lobbyists. Upton said he took flak from some of his home-state media outlets for going to the Detroit Auto Show—in his own car. He said he had no plans to fly to Las Vegas on his own dime.

Last year, Upton preceded his Vegas trip with a bill to raise broadcast indecency fines from $32,500 to $500,000 per violation. It passed Congress 389 to 38, and the Senate passed a similar bill 99 to 1, but reconciliation of the two got stuck in the Senate Commerce Committee

That committee is chewing on several other TV items, including retransmission consent. Led by EchoStar and the American Cable Association, multichannel video providers are attacking retrans, saying broadcasters use it to strong-arm carriage for marginal cable networks. Stevens expressed concern for the situation, but a hearing on the issue was usurped by the swearing-in of Supreme Court Justice Samuel Alito. Meanwhile, more broadcasters, such as Nexstar and Sinclair are moving away from retrans bundling in favor of cash deals, and CBS sans Viacom is preparing to do the same. ■

MEDIA SERVER TECHNOLOGY

Karl Paulsen

Storage Increases With Perpendicular Recording

Densities rise, physical sizes shrink, performance improves and applications continue to grow. Sounds like solid-state memory or computer processor growth, right? Certainly, but if you were thinking "magnetic disk storage," you'd also be right. The dynamics of data storage continue to defy rational reasoning, and in similar fashion to IP-centric technologies, the ongoing balancing act over storing data on spinning media keeps challenging how industry users and manufacturers approach the technology issues.

How is it that the storage world continues to reach for and then exceed the boundaries of physical expectations? How far might technology stretch capacities to address the incessant need for data retention on a medium that is still in its first half-century of deployment? There are no timely answers with finite bounds, but the challenges continue as the digital medium touches all aspects of our lives and occupations—in the professional space and consumer products.

It is no secret—advancements in magnetic disk drive storage technologies have made their way into all sorts of mainstream and niche applications. High volume storage on form factor drives of less than 2 inches are running entirely on batteries. This string of improvements significantly increased storage capacity by increasing areal density in a profound way. Before addressing the new improvements, a quick review of disk drive storage principles is in order.

"Areal density," or "bit density," defines the amount of data that can be stored in a given unit area of a disk-drive surface, and is generally expressed in "bits per square inch." As the science of disk-drive storage forces increases in areal density, a physical limitation is reached whereby no additional magnetic information (bits) can be retrieved without the risk of significant error—regardless of how many techniques for error correction schemes may be applied.

There is a two-dimensional relationship of data on a disk drive that is expressed by both "track density,"—the measure of how tightly the concentric tracks on the disk are packed; and by linear or "recording density,"—the measure of how tightly those bits are packed within a length of track. For these metrics, track density is expressed in tracks per inch and linear density is expressed by bits per inch per track. Specifications often refer to these items which aid in selecting a proper balance of storage capacity, access and seek time, and read/write properties, (see Fig. 1).

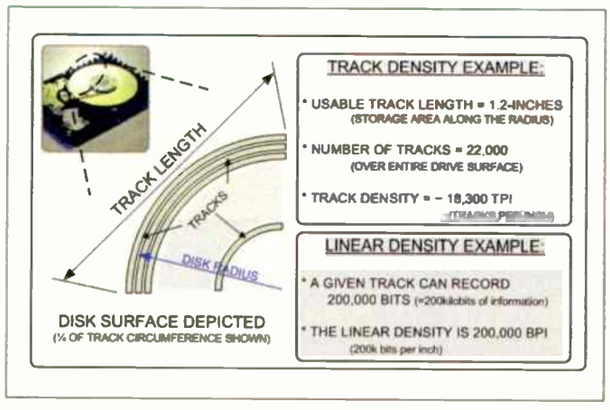


Fig. 1

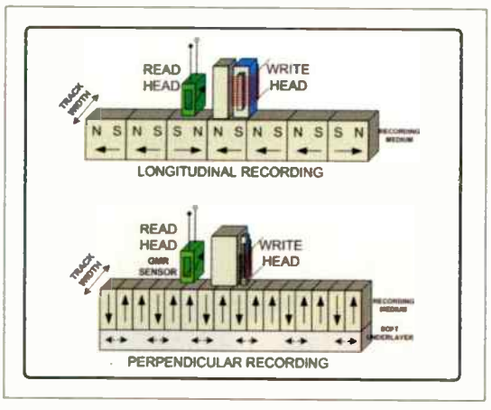


Fig. 2

One constraint on the aerial density barrier is the superparamagnetic effect, or SPE—the point where the microscopic magnetic grains on the disk's surface become so physically minute they lose their ability to hold a magnetic orientation and begin to interfere with each other. When this occurs, the north and south magnetic poles of the bits spontaneously and without warning reverse; corrupting the data to the point the drive becomes unusable.

MAGNETIC BARRIER

The foundation for a solution began when IBM scientists found that when a thin layer of ruthenium atoms (Ru is a transition metal used as an alloying agent for material hardening) was sandwiched between two layers of magnetic particles, a strong anti-parallel coupling is formed between adjacent ferromagnetic layers of the nonmagnetic spacer-layer elements. IBM's principle, in 1997, made possible the first giant magnetoresistive read element for hard disk drives. Giant magnetoresistive reads would soon become common on virtually all disk drives going forward.

Since then, disk-drive areal densities have been doubling every year. In 2000, densities of 17 Gb per square inch were achieved; however, as areal densities approach 100 Gb per square inch, it is likely that thermal instabilities of the magnetization may appear.

These superparamagnetic effects were predicted to appear as areal densities approached between 20 to 40 Gb per square inch, so by the 2003 time frame, drive manufacturers realized they were approaching the point where new technologies were needed to mitigate the negative impact of the superparamagnetic effects barrier.

IBM again found that by applying a three-atom layer of Ruthenium, it produced an antiferromagnetically-coupled media, resulting in a quadrupling of the areal density to nearly 100 Gb of data per square inch of disk area.

Eventually you'll just hit the point where the magnetized areas are so small that the energy necessary to retain magnetization equals the thermal energy of the environment. At this point a drive's operating temperature will provide just enough energy to randomly "flip bits"—where the north/south poles of the bits will randomly change direction—and the drive no longer is reliable.

In 1976, Professor Shun-ichi Iwasaki of Japan's Tohoku Institute of Technology disclosed a magnetization technology that might have dramatically increased storage density. It was predicted that his concept could increase areal density by as much as 10 times; a valuable potential find for the early development of the floppy disk in 1980. However, the concept would be unsuccessful, as Iwasaki's principles, which would later become "perpendicular recording," could not be shown to be reliable. Another 20 years would pass before commercial product development would be resumed.

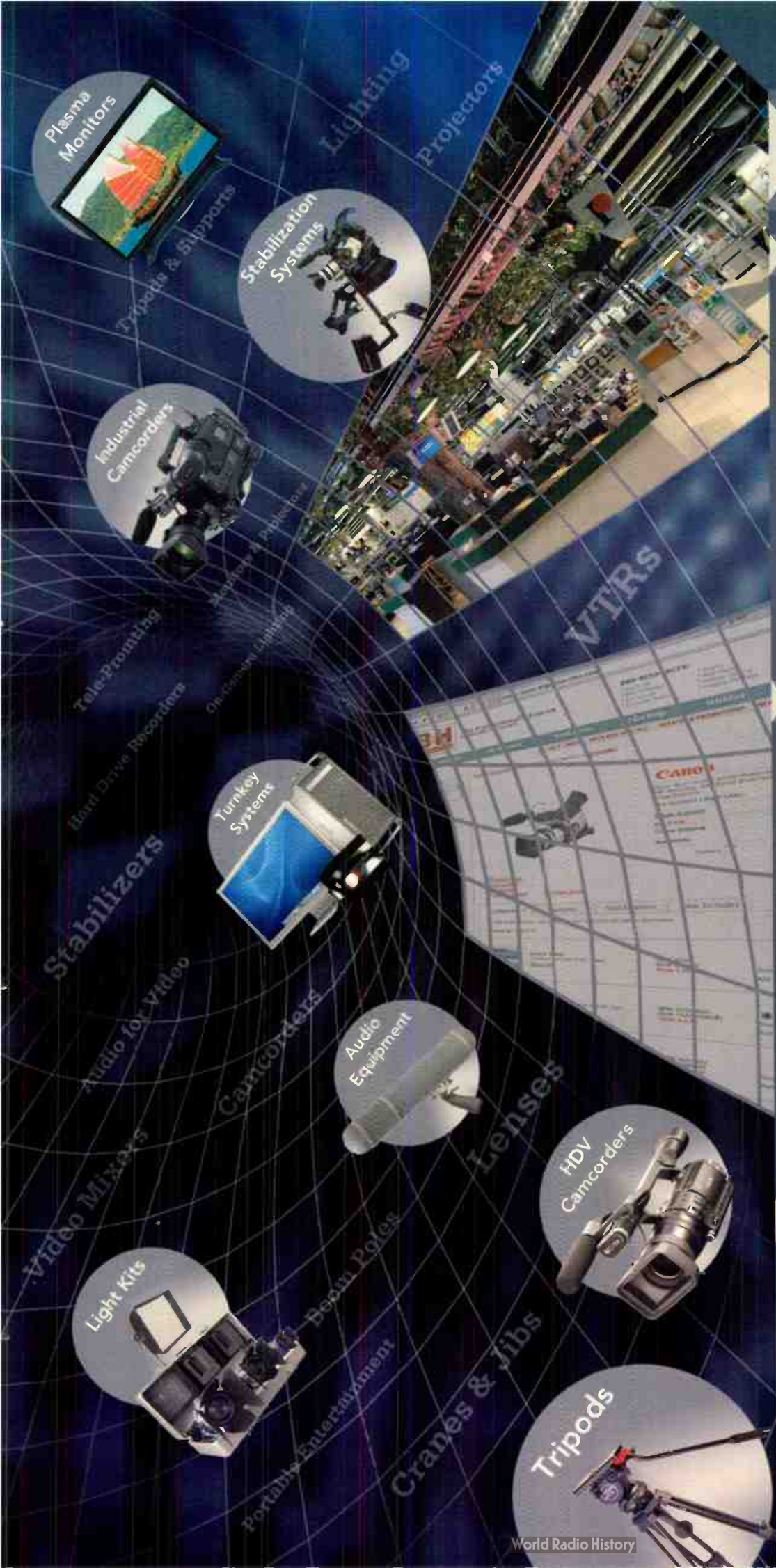
Perpendicular recording would become evident when, in March 2005, Hitachi Global Storage Technologies demonstrated an areal density of 230 Gb per square inch—the highest areal density achieved based on vertical recording at the time. Perpendicular recording would allow a 1-inch drive to achieve a capacity of 20 GB; and for 3.5-inch form factor drives, a full terabyte.

The underlying difference between perpendicular recording and traditional longitudinal recording—where the data bits are horizontally aligned and parallel to the surface of the disk—is that in perpendicular recording, the bits are aligned vertically, or perpendicular, to the disk.

This key difference increases the space on a disk in which to pack more data, resulting in higher recording densities. Perpendicular recording addresses not only the existing media surface but also the layer known as the soft underlayer. Figure 2 depicts how longitudinal bit alignment requires more linear space; and by adding a thin soft underlayer atop the disk's surface, perpendicularly recorded bits can stand on end, significantly increasing packing density.

Within two years, following the entry of commercial applications for perpendicular recording, small format disks are now in numerous commercial and consumer products. Seagate's notebook sized 2.5-inch drives, shown in January 2006, have up to 160 GB of storage space on a 5,400 RPM hard disk. Others expect that the majority of their hard-disk storage devices would most likely use the new perpendicular recording technology by the end of this year, dramatically increasing storage capacities and fulfilling many needs for new mobility products.

Karl Paulsen is vice president and chief technology officer for AZCAR. He is a Fellow in the SMPTE and a SBE Life Certified Professional Broadcast Engineer. Contact him at karl.paulsen@azcar.com.



INTO THE SOURCE

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INSIDE AUDIO | Dave Moulton

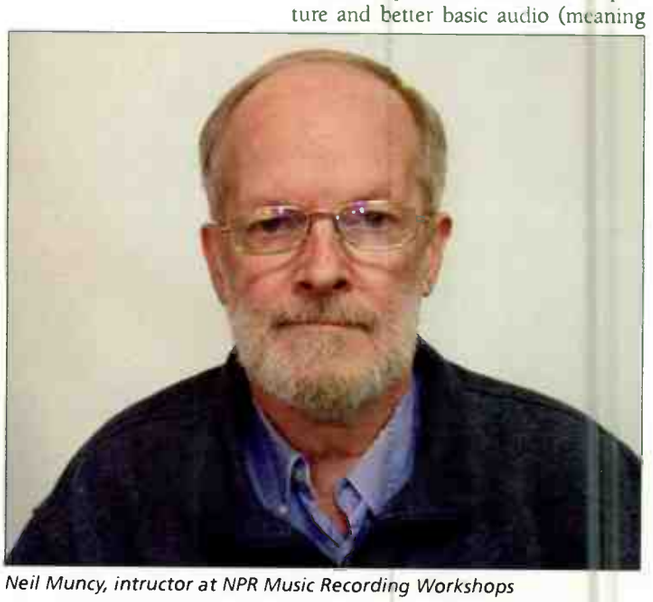
TV Levels at Home: A Canadian View

History buffs and reasonably alert readers may recall that back in the day (2003-04), I wrote several articles dealing with the disarray of audio levels at our beloved end-users' sofas, couches and recliners.

Among other things, I noted that (a) we experience a variance of something like 18 dB in levels across channels, (b) that dialnorm is usually left in the default setting, or else switched to its "no attenuation" level (both constitute an abuse of the dialnorm concept), (c) that digital tiers are usually significantly lower in level than analog tiers and (d) in general, it's a miserable state of affairs regarding audio levels in televisionland.

Well, here we are in 2006. How're we doing? Well, not so hot, it appears. But, there's hope! First, let me share with you some other poor benighted soul's misadventures with TV audio. Avanti, as we used to say in South Bend!

About a month ago, I got a call from Neil, who had spotted one of my columns on TV levels and wanted to share with me a little about his experiences in Canada, where he lives.



Neil Muncy, intructor at NPR Music Recording Workshops

AUDIO UP NORTH

For those of you who don't know of Neil Muncy, well, you should. Neil is an audio guru's audio guru. I got to know him back in the 1980s when he was teaching and inspiring people at the now legendary NPR Music Recording Workshops. He instantly became a mentor for me, and has been a source of inspiration and information ever since. Back in the 1960s, he built custom consoles (before there *were* console companies!) for a range of clients. Some of those consoles are probably still in service today. He has a number of really juicy engineering credits ("Bill Cosby–Himself" for instance) and in more recent years, he has been at the forefront of some significant acoustical innovations (with Peter d'Antonio of RPG and Dave Griesinger of Lexicon) as well as a movement to improve the quality of audio system grounding (with Bill Whitlock and others). In short, Neil is da man! No two ways about it.

Well, about a month ago, I got a call from Neil, who had spotted one of my columns on TV levels and wanted to share with me a little about his experiences in Canada, where he lives.

Neil's cable provider is Rogers Communications Inc., a major Canadian telecom company. Neil was fairly comfortable with his cable services, subject to the usual sort of professional gripes about picture quality and general limitations of TV audio (not Rogers' fault). However, in April 2005, Rogers "went digital" and things changed, for better and for worse.

On the plus side was a better picture and better basic audio (meaning improved bandwidth and dynamic range). At the time, Neil said, Rogers simply set dialnorm to –31 dBFS. Interestingly, Neil found the general array of levels to be sort of satisfactory at that point (which is *not* what I've found in the United States with Charter Communications).

The downside began to emerge, according to Neil, in October 2005, after an initiative was undertaken by the Canadian Cable Television Association to fully implement the dialnorm protocol as specified by Dolby. At that point, Neil said, levels began to diverge again, by as much as +/–10 dB. Not good.

Now Neil is not one to fly off the handle. He's a measuring fool (like me) and so he has begun to carefully measure both the electrical audio signal and the acoustical levels, using a variety of meters and protocols. He has also gotten in touch with both Dolby via Jeff Riedmiller, and Rogers' technical staff to help diagnose the problem.

The problem is that Neil cannot reconcile the measurements he makes with a VU meter, a peak meter, an A-weighted real-time spectrum analyzer, an A-weighted slow-detection sound level meter *and* what he hears. Neil has also, on occasion, used the Dolby LM100 meter as well, courtesy of Riedmiller.

As Neil puts it with more than a little frustration, "Two stations that have the same *dialnorm* settings and the same Leq(A) levels may be up to 10 dB different! I don't know what it is, but some-

LEVELS, PAGE 36

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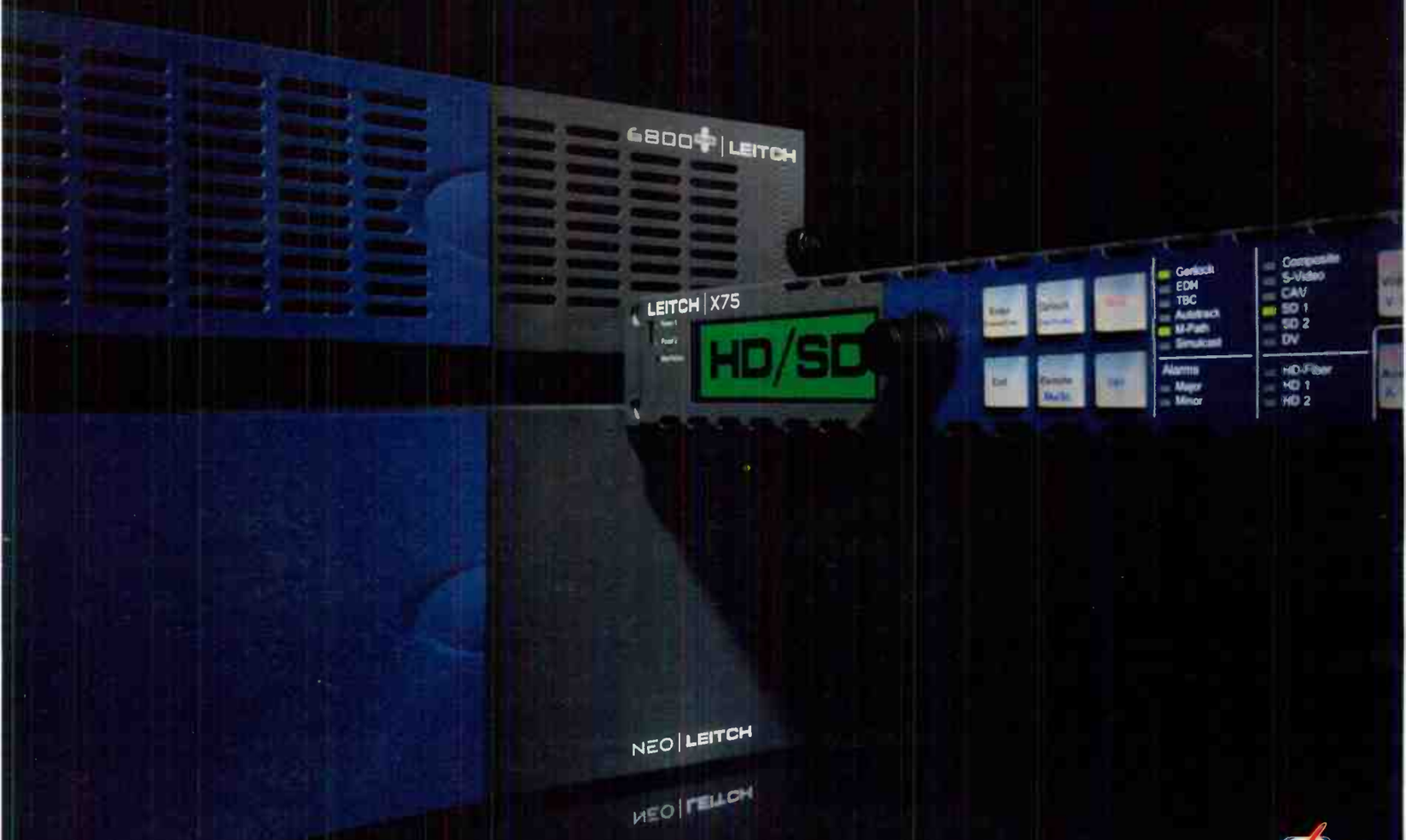

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LET THERE BE LIGHTING **Andy Ciddor**

Knowing When How Much is Enough

I suppose that it's just another example of market forces at work, but still I'm troubled by the constant escalation of what are usually referred to as "production values" in the shows that we make. Maybe it's because I'm not often a beneficiary of the accompanying budget increases that I look upon this trend with such a jaundiced eye, but I would like to think that it's really because I hold on to a reasonable set of aesthetic standards.

Over the holidays, I watched a Christmas carols broadcast from a station where I worked long ago. What used to be lit with a crew of four in a day or two using six ancient Mole 10Ks (Mole Richardson 10 kw Fresnels), a dozen Mole 5Ks, and a van load of Mole 2Ks, has become a monster. A couple of decades later, this 20-camera production (formerly four), with a set that now requires three months to construct, uses hundreds of moving lights and hundreds of LED matrix fixtures.

Staged in the same amphitheater as ever, it now takes that city's largest concert production company a full week to rig the truss system and lighting. Yet the band and the choirs are not noticeably larger and they still sing the same carols and mostly the same popular Christmas songs. Clearly, the show's producers were able to find sponsors to buy commercial time and branding at a sufficient price to pay for the production, and still make a handsome profit. I'm left with the nagging question: "Why?"

TALK ABOUT REMOTE

That production however, was really only the icing on the Christmas cake of the question that has been forming in my mind for some time now. After a lot of rumination, I think the question finally coalesces into: Why is too much never enough?

What originally provoked these thoughts was a totally baffling awards presentation broadcast. It was obvious that the producer of this show was an avid fan of the Oscars, as the set was essentially a replica of a previous Academy Awards broadcast. Since borrowing the best from others' ideas has been the driving force behind human civilization, such derivation would hardly warrant any comment if only it had been even vaguely appropriate for this production.

The three vast LED screens at the back of the set worked well for showing the nominations packages for each award, but the stage itself was simply too large. Once a winner was announced, it could take the recipient up to half a minute to cross the football-field sized seating area to reach the stage steps. Then followed a further excruciating 20 seconds of walking across empty acres of high-gloss black stage floor to reach a lectern at the far camera left of the set to receive the award. On finally arriving at the lectern, recipients were given their award, then curtly reminded that acceptance speeches were to required to be very brief.

With such a vast stage and screens, I expectantly awaited the big production number that would fill the area with singers, dancers, musicians, acrobats, choirs, illuminated staircases, horse-drawn wagons, a moto-cross demonstration, sailing ships, a fleet of vintage cars, or an entire company of Cirque du Soleil.

Instead, what I saw were two songs played by a popular four-piece rock band tucked under the video screen in the furthest camera-right corner of the stage. To avoid losing them completely in this cavernous abyss, the director wisely shot both segments almost entirely in close-up on handheld cameras. This was a highly successful strategy, as it was almost impossible to tell that these were not pre-recorded inserts, shot someplace else.

Only once was the center of the stage used: when two presenters stood at a single microphone to announce that year's inductee into the hall of fame. Sadly, this was a posthumous award, so the night's only opportunity for an award recipient to walk directly up to the presenters to receive their award was missed.

My worry about this production arises not from the extravagance or expense of the set, because we can safely assume that somewhere a sponsor must have been willing to reach into their pockets to provide whatever that set

ENOUGH, PAGE 38

With such a vast stage and screens, I expectantly awaited the big production number that would fill the area with singers, dancers, musicians, acrobats, choirs, illuminated staircases, horse-drawn wagons, a moto-cross demonstration, sailing ships, a fleet of vintage cars, or an entire company of Cirque du Soleil.

Photo: Steve Jordan

NET SOUP

Frank Beacham

Digitizing a 'Bankers Box' of Media Assets

Over the past year there's been much news about the distribution of television programming over the Internet. However, a revolution in the work habits of those who use the 'Net to research stories and collaborate in the making of films and television programming has been less visible.

I address this subject from the perspective of a writer who is currently caught in the eye of the storm. When I'm very lucky, stories that I research—often over many years—sometimes become feature films or television shows. I learned long ago the value of being a pack rat when it comes to combing through the myriad details from true stories.

When pursuing a story, I make audio recordings of all my interview subjects. (Video is still too intrusive for many people to speak freely.) I take photographs of everyone and everything connected to the story. I acquire personal snapshots, newspaper clips, and other documentary artifacts whenever I can. I pursue small, random scraps of information—fragments that I've learned can later turn into important details.

In theory, most of these story elements can be digitized, cataloged, and easily accessed on a computer. In reality, independents such as myself rarely take the time to deal with computer technology. In my case, I created over the years a kind of freeform depository—the cardboard "bankers box," available for under $5 at most office supply stores.

Sonic Solutions CD Spin Doctor can be used to transcode analog audio files to AIFF sound files.

Of course, these boxes proliferate. Row by row, floor-to-ceiling, they sprout like kudzu, eventually dominating every available space. The good news is that everything is there (somewhere). The bad news is... well, just try finding something.

COAST TO COAST

Then, one day, success comes. Now this filing system catches up with you and the crisis begins. A project I've been working on since 1988 was recently sold as a feature film. Part of my task is to supply the screenwriter with anything he needs from my book and its underlying research.

Not only do I have to find and organize all the "stuff" from the tall stack of boxes, but I must make it available to share, not in the same office, but across the country. I'm based in New York City. The screenwriter lives in Los Angeles.

OK, so the inherent weaknesses of my "banker's box" system became alarmingly apparent. I had to change my ways or drown in a sea of minutiae. Fortunately, my timing was right.

When the term "workflow" is used in a publication like **TV Technology**, it usually means the processes used throughout the media production and post-production chain. But workflow can also be applied to any part of the sequence of events that results in a production—including research, writing and collaboration among members of the creative team.

My project, centering on an old murder case, involves dozens of interviews and hundreds of documents, photographs, charts, and media snippets. Audio formats range from 1/4-inch tape and microcassettes to DAT tapes, Minidiscs and .wav files. Photographic formats include 4 x 5 negatives, APS cartridges, and 35mm prints and slides. Documents range from newspaper articles to books. There is a smattering of 16mm news film from the 1960s.

DIGITIZING, PAGE 35

RF TECHNOLOGY

Doug Lung

Ready for a New Wave of DTV Viewers?

At the Consumer Electronics Show in January, I looked for products with ATSC tuners, especially portable TV sets. If you've been following my weekly RF Report articles online, you know that manufacturers have introduced a wide range of portable DTV receivers and USB tuners for DVB-T systems, but only a limited number of similar ATSC products.

If what I saw at CES was any indication, that's about to change. FCC tuner mandates also require manufacturers to include ATSC tuners in lower cost TV sets with smaller screens. Many low-cost ATSC set-top boxes will be available later this year. When these products start showing up on retailers' shelves, TV engineers will be under more pressure to make sure their stations' DTV signals are up to par, both in quality and signal strength.

Many of the viewers station engineers talk to today are enthusiastic early adopters of DTV. Through groups like the AVSForum (*www.avsforum.com*), DTV viewers compare quality among networks and stations, use tools like TSReader to analyze bitstreams to see how much bandwidth stations are allocating to HDTV, and sometimes recognize problems with a station's signal before the station engineer notices it. If they can't receive a station's signal, they take the time to adjust their antenna, or in some cases even replace the antenna.

When more consumers take home products with ATSC tuners and expect them to simply work, that situation will change. When that new 32-inch LCD TV is unpacked, will the purchaser notice that they can hook up an antenna to it to receive free digital TV broadcasts? If they do, will they take the time to see what they can pick up off-air? If they make it through all these stages, will they find it easy to receive DTV signals with what is likely to be a marginal indoor antenna?

TUNER FUTURE

When I saw manufacturers at CES showing a DVB-T portable receiver or miniature USB tuner for notebook computers, I asked them if they built or planned to build a similar product for ATSC. I was pleasantly surprised to see most were working on ATSC portable devices and either had prototypes on display or planned to have products developed in the first half of this year.

There was some uncertainty over whether the products would attract as much interest here as they had in Europe, but they were willing to give it a try. High-quality, low-cost reference designs such as the one recently introduced by Zoran and Thomson make it easier for these manufacturers to add ATSC to existing DVD players and SDTV set designs. If manufacturers built them, will retailers devote shelf space to them? Will they demonstrate them?

Unfortunately, without more consumer education to drive demand, I fear the answer to many of these questions will be "no" and that does not bode well for the future of free over-the-air TV broadcasting. What can you and your station do to help?

If you are responsible for a DTV facility, make sure it is working properly, i.e., transmitting a stable 8-VSB signal with a signal-to-noise ratio of 27 dB or better with the correct PSIP information.

If you are designing a DTV facility, it isn't enough to look at the FCC service area coverage. You need to provide as many viewers as possible with a far stronger signal. I like to work with a nominal signal level 20 dB above what the FCC considers "community grade" DTV coverage and, as much as possible, provide a predicted signal an additional 20 dB above that. While a signal 40 dB over the FCC community grade level may not be necessary for fixed set reception with a good indoor antenna, it provides a much needed margin for locations without clear line-of-sight to the transmitter, and helps compensate for the poor antennas likely to be used with portable DTV sets, under-cabinet DTV sets in the kitchen or notebook PC USB tuners like those I saw at CES.

We need to show the public how good DTV can look. Recently, a Washington Post columnist raved about the off-air picture quality from his low-cost 27-inch RCA DTV set. That column was distributed to papers around the country. More articles like that should help, although it would have been better if the writer had had an easier time receiving all the Washington, D.C., DTV stations without re-orienting his antenna! At station publicity events, don't just show the public what HDTV looks like on a big-screen TV set, show them how much better your signal looks on an older analog set when an ATSC set-top box is added. Using a simple indoor antenna will highlight the difference and show that off-air reception doesn't have to be difficult.

OUT IN FRONT

Off-air DTV reception and recording on a notebook PC can be a quick and easy way to show DTV to friends. However, be warned that the processing power required to decode HDTV strains many older computers, causing picture breakup and crashing the program. That problem isn't as common with DVB-T USB tuners because most DVB-T programming is transmitted in standard definition at a significantly lower bit-rate. More recent notebook computers, especially the wide-screen units designed for multimedia use, can handle HDTV without difficulty. Test first!

Whether or not free over-the-air DTV succeeds will depend largely on how well broadcasters prepare their over-the-air viewers for the planned analog shut-off in 2009.

Finally, when these new viewers bring their sets home, we have to make sure they aren't disappointed. Use local spots and your station's Web site to show viewers how to hook up a set-top box and what types of indoor antennas work well. I notice many station Web sites have information on HDTV, but the link isn't always prominent on the home page. Give them a number to call or an e-mail address to contact if they need help. Point viewers to Web sites like *www.antennaweb.org*, which will tell them what type of antenna they need at their location to receive different DTV stations. A good place to start the education process is with station employees. Do they understand how DTV works? Can they help others?

Whether or not free over-the-air DTV succeeds will depend largely on how well broadcasters prepare their over-the-air viewers for the planned analog shut-off in 2009. The percentage of viewers depending on over-the-air has declined greatly in the last 30 years. Can we attract more viewers to DTV? Some say no. I've asked a lot of questions this month, but I'll close with one more. Ten or even five years from now, tuning across the channels, what do you expect to see on your local DTV stations? What you and your station do in the next two years could have a big impact on the answer.

I welcome your questions and comments. Send them to me at dlung@transmitter.com.

Digitizing

CONTINUED FROM PAGE 33

I began by emptying the banker's boxes and organizing the media by type and priority. First, I tackled the images. I used an Epson Perfection 4180 photo scanner to create TIFF and JPEG images of the visual media. Then I organized them by category and folder on my Apple iMac. This way I could create slide-shows for groups, and quickly find photos of any individual or story element.

Apple's "Spotlight" feature, which arrived last year with the current version of OS X, expedites my ability to locate any media file—it has become essential to making this system work. Spotlight not only reads the metadata on any of the images in any folder, it searchs large numbers of text documents in seconds.

Audio was the most time consuming. I decided to digitize everything. Armed with a "Jurassic Park" of ancient audio playback devices, I used CD Spin Doctor, developed by Sonic Solutions, to transcode the audio into AIFF sound files. From these large, high-quality master files, I made compressed .mp3 copies in mono so that others involved in the production could easily listen to them on their home computers, iPods, or other media players.

Because many of the files were too large to e-mail, I used Apple's .Mac service to make the .mp3 files, photos and other documents available for download. Included with the $99-a-year Apple service is a virtual "iDisk" that includes a public folder. Once my collaborators have my iDisk password, they easily download any posted file. This has turned out to be a very powerful collaboration tool, enabling people to work together anywhere in the world.

I have gradually turned the bankers boxes into virtual containers of data that can be easily moved around over the Internet. Though I'm careful about making backups, it is good to know that others also have copies of important data.

Once I created this large "bucket" of data, I then addressed how to access it away from home base. At first, I just assumed one way: a laptop. Then I had an "ah-ha" moment. If the television is migrating to the video iPod, why can't all the multimedia elements of the production also go there?

Obviously, the .mp3 audio files were ideal for iPod listening—we were already doing that. But what about the mixed bag of photographs and video images? Would huge .tiff files work on an iPod without a lot of time-consuming manipulation? They work perfectly!

While far more expensive portable media players require resizing and downsizing of photos, the iPod—combined with Apple's iTunes and iPhoto—does it automatically. Simply drag and drop the picture to iPhoto and on the next update, it appears on the iPod—no conversions or hassle. Each photo just appears, whether as part of an electronic contact sheet or a slide show.

The video iPod supports H.264 and MPEG-4 video formats. Quicktime 7 Pro does an easy conversion with a menu option to automatically create an .m4v file containing H.264 video and AAC audio optimized for the iPod. With an A/V cable, video and photos can be displayed on TV set with a video input.

iMovieHD

While on location, the video iPod allows quick access to a range of research materials without the need of a bulky laptop. The image quality is surprisingly good and the software even allows viewing images of interview subjects when listening to their words. A very powerful research tool!

Moving forward—on this project and future ones I undertake—every research element will begin in the file domain. When possible, all new video and audio will be recorded as files. Digital photography has all but replaced film, while scanners are now so cheap and easy to use that they greatly reduce paper. Metadata now gets its due respect, especially since it has become as easy to maintain as checkbook balancing.

Just as the Internet is becoming an important new distribution medium for finished television programs, it also works equally well behind the scenes for creating new works. Cheap and simple Web tools allow easy collaboration among creative workers regardless of location.

Without nostalgia, I look forward to the day when I can say a final goodbye to the venerable banker's box. No good old days here! There's a better way now, and I can't wait to leave the old "workflow" behind.

Frank Beacham is a writer and producer based in New York City. He can be reached via TV Technology.

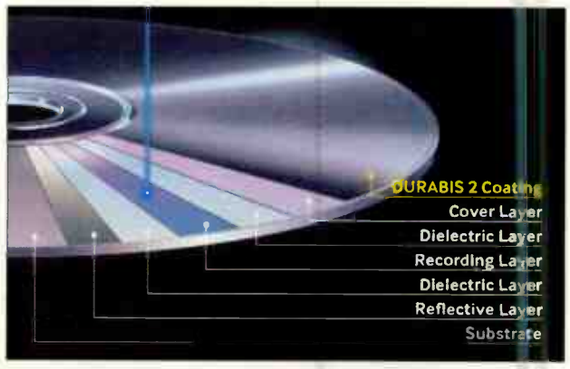
TECHNOLOGY CORNER **Randy Hoffner**

Hi-Def DVDs Are Finally Here

We are all aware that high-definition DVDs have been a long time coming, and as ever with A/V recording technology, two incompatible formats are vying for the hearts of consumers. In the case of high-definition DVD, the two formats are Blu-ray and HD-DVD. The arguments about the superiority of one format over the other are marketing and "electro-political" issues. Let's take a look at some of the technical aspects of the two formats.

The standard compact disk contains digital audio recorded in uncompressed form. The amount of data required to represent video, on the other hand, is too great to be practicably recorded in its uncompressed form on a 12 centimeter optical disc. The standard DVD uses MPEG-2 video compression to reduce the data content required to represent a video program of reasonable length. As a frame of reference, a CD can contain about 700 MB of data, while a standard DVD can contain about 4 GB of data.

Either of the high-definition DVD formats can accommodate compression coding using MPEG-4 AVC or VC-1.



Forthcoming TDK Blu-ray high-definition DVDs feature the company's Durabis technology to protect the disc surface against scratches and resist smudges from fingerprints.

Both of these formats are intended to store hig definition video and multichannel audio data on digital optical disks that, at 12 centimeters in diameter, are the same size as compact disks and standard DVDs. The digital data is recorded on the disks in the same fundamental manner as that employed on CDs and standard DVDs: a laser is used to burn a series of pits into the substrate material. Coding schemes aside, two binary states—positive and negative—must be represented on the

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Levels

CONTINUED FROM PAGE 30

thing is not set right."

This from an audio guru's audio guru. You have to take it seriously.

PLAYING CATCH-UP

The easy way out would be to blame Rogers, CCTA and/or Dolby in the usual blame flamefest, but Neil has no interest in any of that and neither do I. After perusing the CCTA Digital Audio Working Group Web site (*www.ccta.com/english/View.asp?t=&x=247&mp=1*) and having a couple of follow-up conversations with Neil and Riedmiller, a more nuanced picture emerges.

The current situation is this: TV audio levels management in Canada via *dialnorm* is very much a work in progress. Happily, there's been a lot of work and a lot of progress. Rogers is hard at work but admittedly a little behind the curve. Some of the other MSOs are currently doing quite well in this regard and CCTA is maintaining an active and productive stewardship of its members' needs and service commitments.

One of the most interesting *and* fundamental items on the CCTA Digital Audio Working Group Web site is a presentation from Riedmiller that should be required reading for all of us trying to deal with metadata (*www.ccta.com/CMFiles/CCTA_2005_Dolby_JCR6+OKA-322005-2926.pdf*)

There also are some interesting comparisons to be made with how the Canadian broadcasting industry and the American broadcast industry are dealing with these problems. It's instructive at all levels. I will continue this with a much deeper look at Dolby's view of things and the efforts of CCTA next month.

Thanks for listening.

Dave Moulton is trying to keep a level head, which is hard for him these days. You can complain to him about anything except Neil Muncy and Jeff Riedmiller at his newly revised and way cool Web site, www.moultonlabs.com.

DVD

CONTINUED FROM PAGE 36

We are well aware that the quantity of data generated by high-definition video requires another leap in data storage capacity to make a high-definition DVD a practical reality.

VIOLETS ARE BLUE

Either of the high-definition DVD formats can accommodate compression coding using AVC or VC-1, which permit equivalent video quality at higher compression ratios than those afforded by MPEG-2, (as well as MPEG-2 itself). This is helpful, but not sufficient.

Fortunately, we now have blue-violet lasers. A semiconductor laser has two properties that are fundamental to its use as a DVD-burning device—it emits light at a single, narrow spectral wavelength, and the light that it emits is phase-coherent. Phase coherency concentrates the energy of the emitted photons so they may be used to burn pits in a substrate, while the emission of a single wavelength facilitates control of the physical size of the resultant pits. The standard DVD uses a red-light laser with a wavelength of 650 nanometers. For those with an RF orientation, 650 nanometers corresponds to a frequency of about 461,220 GHz. A blue-violet laser emits phase-coherent light at a wavelength of 405 nanometers, or a frequency of about 740,230 GHz. This is about 0.6 the wavelength of the 650 nanometer light, and it facilitates burning a smaller pit.

The brand name of one of the high-definition DVD formats notwithstanding, both formats use the 405 nanometer blue-violet laser. It is at this point that the formats diverge. The two formats use different lens systems to focus the laser light, and these systems have different numerical apertures.

Numerical aperture is a measure of the lens system's ability to gather light and thus resolve fine detail at a fixed object distance.

When light hits an object, or a pit, it diffracts, splitting into several diffraction orders that are bent at increasing angles from the original beam. So when light is reflected off the substrate surface, it scatters at various angles rather than reflecting directly into the lens.

The light beam reflected off a pit in the substrate reaches the lens in the shape of an inverted cone; the point of the cone is at the pit, and the broad base of the cone, at the lens surface. The angle of the side of this light cone is called the "angular aperture." The numerical aperture is equal to $i(\sin q)$, where q is one-half the angular aperture, and i is the refractive index of the medium between the object and the lens. In this case, the medium between the object and the lens is air and the value of i is 1.0, so the numerical aperture is simply $\sin q$.

The numerical aperture of the HD-DVD format is 0.65, while that of the Blu-ray format is 0.85. The HD-DVD disk has a track pitch of 40 micrometers and a minimum pit length of 204 nanometers, while the Blu-ray disk has a track pitch of 32 micrometers, and a minimum pit length of 160 nanometers.

The geometry of the optics used in the Blu-ray format requires the pit tracks to be located closer to the surface of the disk than those of the other format. The practical result of this is that the disk's outer surface is more in focus than in other formats where the tracks are located farther away from the surface, and the optical system of the player is thus less able to see through surface dirt and scratches while focusing on the pits. This produces the requirement for a cleaner surface, and a stronger polymer coating that is more resistant to scratching and chipping.

Those are the fundamental technological differences between the two high-definition DVD formats. What materializes in the marketplace is still an open question.

Randy Hoffner is manager of technology and strategic planning for a TV network. Write to him c/o ***TV Technology****.*

Enough

CONTINUED FROM PAGE 32

may have cost. The real concern is that there was no apparent relationship between the set and the aesthetic and production requirements of the broadcast.

Maybe it was even a selling point when the producer was gathering sponsors that this awards presentation was to be on a set that replicated the one at the Oscars. No doubt, that set must have looked damned impressive to the audience walking into the presentation, especially to the sponsor and their entourage of important corporate guests, who got to have dinner with the award nominees and a ringside seat at the presentation.

The set certainly looked spectacular in the opening shots, with zooming, craning and panning cameras, moving lights and followspots doing ballyhoos around the dining tables, and frenetic montages running on the screens. However, it didn't take long for the vast emptiness of the stage and the interminable delays as the award winners made their way to the lectern (usually well and truly exceeding the length of the covering video footage), for the production to become a travesty. The stage got more airtime than the awards recipients, and totally dwarfed them on the wide shots. Most of the set was not used during the broadcast, which must have been a source of some frustration to the crews who constructed, painted, lit and equipped it.

It must be very hard for a production team to turn down a huge production budget, and the opportunities it brings to try out some new gear and new techniques, even when it's clear that the production simply won't work.

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****.*

PRODUCTS & SERVICES SHOWCASE

USER REPORT

WOAI-TV Braves Katrina with Shook

by Richard A. Quiroga
News Operations Manager
WOAI-TV

SAN ANTONIO, TEXAS

Being born and raised in San Antonio certainly has its advantages when it comes to knowing how best to use the tools of our trade here at News 4 WOAI, the NBC affiliate. Our daily challenge of gathering and covering breaking news and weather-related events can test our equipment 24 hours a day, seven days a week. We need to know that our equipment will survive the sizzling summers and winter freezes typical of our hill country.

GOODBYE TO 'BIG BERTHA'

We made an excellent choice when we traded in the comfortable but economically draining "Big Bertha" diesel SUV for our first hybrid ENG/SNG Ku-band truck. For this transition, we turned to Shook Mobile Technology, also based here in San Antonio. We decided on the A-11 ENG/SNG van. Taking delivery from Shook included one day of training and, of course, the initial shakedown of all the equipment. Several weeks of training for our photographers followed. Having a much smaller truck also meant that less staff was needed to run it.

Our response time to breaking news and weather events is fantastic, since now all of our photographers can run our A-11 van. A lot of the advance planning and preparation, such as special clearances and parking permits, which we used to have to do with our big truck, is history. Another plus with our smaller ENG/SNG truck is that regular maintenance is easier and more economical.

Even if we were to break down while out of town, the fact that we no longer have to wait for a large "King Kong" tow truck can be a big time saver. Being able to take our smaller vehicle to any local Ford dealer is very convenient since regular maintenance of brakes, shocks and tires is a must due to the amount of weight carried.

KATRINA: THE ULTIMATE TEST

Our biggest test came last year, when I was personally assigned to take our A-11 to New Orleans, the Sunday before Hurricane Katrina made landfall. I arrived in Metairie, La., on what was to become the eve of Katrina's devastation. Being based in a Metairie hotel only five miles from the Superdome was thrilling and frightening, but we knew we could rely on our van. It was able to stand up to the gusting winds and rain, while enabling us to broadcast up until 5:30 a.m. Monday. Our only equipment casualty was on our mast-cam when the seals broke and it took in water.

Hurricane Katrina put Richard Quiroga and the WOAI-TV truck to the ultimate high water and wind test.

Living and working in an A-11 van for seven days and nights has given me a very detailed knowledge and understanding of our truck. This knowledge was beneficial when it came time to order our next generation of hybrid ENG/SNG trucks from Shook.

Richard A. Quiroga is manager of news operations for Clear Channel's WOAI-TV in San Antonio, Texas. He has been with WOAI-TV for more than five years. The opinions expressed are those of the author alone. He may be contacted at richardquiroga@woai.com.

For additional information, contact Shook Mobile technology at 210-651-5700 or visit www.shook-usa.com.

USER REPORT

Clark Connects with Telecast

by Gary C. Snyder
President and Engineer
Clark Peoduction Associates

BETHLEHEM, PA.

Clark Media is a production equipment and services company. We provide high-end production equipment and services to broadcast and corporate clients, primarily between Boston and Washington, D.C. since 1985. Recent events include live coverage of the 2006 New Year's Eve celebration at the Hard Rock Cafe for ESPN with our 40-foot digital truck.

Our inventory includes more than 35 camera systems with triax and multicore units, as well as a large inventory of SD and HD camcorders. Within the past year, we have seen increasing use of our Panasonic SDX-900 and Varicam cameras. While these camcorders are fantastic for single-camera, film-style production—particularly with their 24p film-style features—they have not been the best choice for multicamera productions from an engineering standpoint.

All of the camcorder's advantages as a self-contained unit worked against us in a flypack situation. We had to use large and bulky multicable harnesses to distribute the necessary power, genlock, CCU functions, audio, intercom and tally controls to the camcorder. As a result, the system was cumbersome, viable only over short distances and prone to intermittent signal problems.

To address this, we invested in Telecast Fiber Systems CopperHead HD/SDIs and analog fiber-optic camera-mounted transceivers. We needed camcorder-mounted systems for an upcoming production, and after evaluation, we found that the reputation of the CopperHead and the company behind it made the selection simple. The transceivers were delivered and implemented within a matter of weeks.

Gary C. Snyder uses Telecast CopperHead fiber-optic technology to streamline field operations.

For me, the single greatest advantage of the CopperHead system is that it multiplexes all our two-way camera signals onto a flexible, lightweight fiber cable that is more rugged and robust than copper cables. This allows us to repurpose our SD and HD camcorders

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Telecast

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in a multicamera environment.

We have the ability to record both a live switched feed and an ISO, with complete command of all camera paint, iris and other remote controls.

Since we added the CopperHead to our rental inventory, we've found many applications where it's a perfect fit. We recently supplied a complete four-camera studio package using the CopperHead transceiver system to tape episodes of Todd Oldham's show for HGTV. We've even used it on single and two-camera HD shoots, as it gives our engineers complete control over the system while shooting on a soundstage.

Last year, we completed a four-camera production featuring many of the world's most famous poets, with the event very well attended. Recording at typical camcorder distances was impossible, as we were using long HD lenses and some cameracorder units were very close to the poets. In addition, we didn't want to disturb the soft passages with the sound of a tape being loaded into a camcorder. The CopperHead saved the day, giving us control over all functions and enabling our crew to make both live-switched and ISO recordings from a control room set up in a trailer a few hundred feet away.

In our particular marketplace, we find that our application range requires control of cameras from short distances—less than 250 feet in studios; and much longer distances—750 to 1,500 feet in field production. The fiber cable used with the CopperHead is robust enough to prevent damage and it eliminates problems such as hum, ground loops and line losses.

The fact that the system is format-independent (480i, 720p, 1080i, or 1080/24p) and camera-independent makes it an extremely flexible tool. We provide cameras from many different manufacturers, and it is very important that the CopperHead system work with any camera. All that is required is the use of a "manufacturer-specific" cable set for CCU control. This is a huge advantage when purchasing a fiber system.

Further, the knowledge that other rental companies also chose Telecast gave me confidence that I can handle larger projects on short notice. As the CopperHead does not require any camera modification, we can rent additional cameras if necessary.

Extra flexibility is provided with Telecast's PowerPlus option, which allows us to supply power to the camera from the base station. The connector can be configured to use the standard SMPTE 311M hybrid fiber/copper cable used on many mobile TV vehicles. We are currently building a small SD/HD mobile truck based entirely on the CopperHead system. As there are so many HD formats available to clients today, we will be able to provide a production platform that allows us to reconfigure cameras and formats on a job-by-job basis.

Gary C. Snyder is president and engineer of Clark Production Associates, a company he formed in 1985. He may be contacted at garys@clarkmedia.co

For more information, contact Telecast at 508-754-4858 or visit www.telecast-fiber.com.

BUYERS BRIEFS

The model D9155 Originator from **Scientific-Atlanta** is an MPEG-2/DVB/ATSC encoder and part of the S-A PowerVu family of transmission equipment. It is designed for direct connection to a satellite modulator, multiplexer, cable modulator or telecom network adaptor for standalone operation. It features switchable 4:2:0 or 4:2:2 chroma encoding and is compatible with NTSC, PAL, PAL-M or PAL-N video signals. It offers optional MPEG or Dolby Digital AC-3 audio encoding. Remote control of the D9155 is accomplished via an RS-232 terminal or SNMP host. The encoder has advanced spatial-temporal filtering for high video quality.

For more information, contact Scientific-Atlanta at 770-236-5000 or visit www.scientificatlanta.com.

The Carry-Coder II from **Broadcast Microwave Services** is a portable COFDM transmitter designed to be mounted directly on the back of a broadcast camera or used in a backpack configuration. The unit offers low delay MPEG-2 encoding and decoding, RF amplification and COFDM modulation for broadcast applications. The transmitter provides a maximum power output of 1 W and an external amplifier is available to raise this to 10 W. The unit weighs 5.5 pounds and accepts SDI as well as analog composite and component signals. The Carry-Coder may also be used as a standalone encoder.

For more information, contact Broadcast Microwave Services, Inc. at 800-669-9667 or visit www.bms-inc.com.

USER REPORT

WABC Takes HD to the Sky With Nucomm

by Kurt Hanson
Chief Engineer
WABC-TV

NEW YORK

When WABC decided to launch a helicopter to transmit in HD this past November, I knew it would be no easy task and planned my system accordingly.

It was important that our helicopter, which is owned and operated by Metro Traffic, be outfitted to switch and transmit in either HD or analog using two A/V paths—one analog and the other digital, with either FM or COFDM (QPSK and 16QAM modulation). Multiple formats would provide flexibility in use of receive sites modified to pass HD, or with existing receive sites.

We selected the components for the chopper after careful evaluation. The camera is a Sony DCR-TRV950, outfitted with a Fujinon lens. This package was integrated by Flir Systems in their UM III HD gimbal, with the HD signal feeding through an 8 x 8 Miranda switcher to a JVC DM–JV600U encoder. A Cobalt downcoverter is used to allow the HD camera to feed the analog switcher.

AES audio is delayed to match the HD video delay. An encoder provides an ASI stream to the Nucomm ChannelMaster transmitter.

The ChannelMaster was selected due to its high output power, small size and weight, low power consumption and the ability to provide both COFDM and single carrier modulation. Single carrier has been demonstrated to offer longer range and higher data rates than multicarrier modulation formats. This is important for maximizing range, performance and quality.

A Panasonic HD1200 videotape recorder, with its built-in downconverter, is used in the chopper to feed tape to the HD and analog switchers.

The NTSC switcher feeds the analog input of the Nucomm ChannelMaster transmitter, which is remotely controlled by a Troll control system. Chopper personnel can switch bands, modulation, power level and channels from the touchscreen panel. Presets make it convenient to store data rates for both HD and analog operation.

WABC-TV chief engineer, Kurt Hanson, checks helicopter-mounted equipment.

Our Verona, N.J., receive site was selected for initial operations. The HD signal is received there by a Nucomm CR6 central receiver and a Nucomm NCRX1 Newscoder COFDM demodulator/MPEG decoder, which outputs an ASI stream. This is fed to the Nucomm MM200 multirate modulator through an IF input select switch, to the FT6 digital/analog transmitter which sends the 20 Mbps datastream to our repeater point in Manhattan. The analog signal is also sent through the IF switch to the input of the FT6. The NSI MC5 system provides control of the receive antenna, central receiver and IF input switch.

The digital ASI stream and analog signals at the receive site are then passed via fiber to WABC at 7 Lincoln Square, using Evertz fiber equipment. The signal then is passed to a decoder for outputting 1080i. We downconvert this to our 720p standard. We also use it to downconvert to SD for monitoring.

Kurt Hanson is the chief engineer for WABC-TV and has been with the station for 10 years. He may be contacted at Kurt.j.hanson@abc.com.

For additional information, contact Nucomm Inc. at 800-968-2666 or visit www.nucomm.com.

USER REPORT

Cashmark Sold on Camplex Reliability

by Daryn Cashmark
Owner
Cashmark Media

OVERLAND PARK, KAN.

Many of the toughest decisions that I had to make when I formed Cashmark Media in 2001 were equipment related. What type of gear would best meet the needs of my small video production company? What switching equipment, cameras, camera adapter systems, monitors, test equipment, etc., should I buy?

Since my purchasing power was limited, the price as well as the performance capability of the equipment was equally important to me. After months of scanning dozens of Web sites, reading numerous articles in magazines like **TV Technology**, mulling over stacks of manufacturer brochures, talking with equipment users and dealers and making a trip to NAB, I began writing checks.

As I never know where we will be working, I decided to assemble portable racks instead of building a traditional truck. The racked equipment can be operated from our climate-controlled trailer when we are outdoors, or as flyaways for indoor projects and other situations where a truck would be impractical. After visiting with Camplex at NAB, I purchased Sony DSR-370 and -570 camcorders, Sony hand controllers and four CP-301B-S5 Camplex adapter systems. What a great combination this has proven to be!

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Daryn Cashmark with some of his company's equipment, including Camplex adapters.

Camplex

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Now when I interface my camcorders and hand controllers with the Camplex systems, the camcorders operate as full-blown production cameras. As the Camplex system delivers all of the video, audio, intercom, tally, and data control signals needed for a shoot, it sends DC power to operate the camera, recorder, lens and viewfinder—all over one 75 ohm cable. For runs up to 250 feet, I use a low-loss RG-59 cable. For longer runs, I use Belden RG-6 with no loss of power or signal quality.

RELIABILITY A BIG PLUS

Not only am I happy with the production capabilities of Camplex, but a really important plus for me is the reliability of the systems. Operating in flyaways is extremely hard on equipment, but my Camplex CP-301 systems have performed flawlessly for more than three years. We've had such great luck with the Camplex gear that we just added a new flypack with four CP-601s.The picture quality is truly impressive, and most people can't believe it's traveling down one small coax line.

The jobs we perform span the gamut, indoors and out—rock concerts, sporting events, corporate meetings, TV shows, training videos. Like the firehouse dog, when the bell rings, we jump on the truck, ready to go. Unfortunately, our current building is at ground level, so we can't slide down a pole, but we've outgrown our location and are looking for a new space. If anyone knows of an old firehouse for sale in the Midwest, let me know! In 2005, the company was fortunate enough to enjoy a 60 percent increase in revenue. Camplex contributed greatly to that growth.

For 11 years prior to establishing Cashmark Media, Daryn Cashmark and a partner, operated a successful lighting and sound company. He may be contacted at daryn@cashmarkmedia.com.

For additional information, contact Camplex at 620-342-7743 or visit www.camplex.com.

BUYERS BRIEFS

The E5784 from **Tandberg Television** is an L-band high-definition encoder designed for use in outside broadcast applications. It supports ATSC or DVB-T standards and provides internally generated PSIP and PSI. The encoder is able to encode at multiple profiles in both SD and HD modes. It provides a test pattern and logo insertion and features adaptive noise reduction and film mode detection. RS-232 and RS-422 ports are provided for data. It has a built-in frequency agile QPSK modulator, which can be upgraded to 8PSK and 16QAM.

For more information, contact Tandberg Television at 678-812-6300 or visit http://www.tandbergtv.com

The 13961 Series are a line of TVRO interference filters from **Patriot Antenna Systems.** These devices are designed to eliminate C-band satellite reception interference caused by radar signals operating above and below the C-band downlink spectrum. The bandpass filters are small enough to allow side-by-side installation of multiple units in multifeed applications. Filtering is performed at C-band frequencies, preventing LNA/LNB overload for improved picture quality. The units offer a 0.5 dB center frequency insertion loss and present a typical VSWR of 1.92:1.

For more information, contact Patriot Antenna Systems at 800-470-3510, or visit www.sepatriot.com

USER REPORT

GMS Scores Points With Mighty Ducks

by Kent French
Production Manager
Mighty Ducks Hockey Team

ANAHEIM, CALIF.

In our ongoing efforts to create an optimum in-game guest experience, we rely on quality camera shots to engage our fans, bring them closer to the action and make them part of the event. This includes the use of wireless RF systems that can deliver solid, reliable signal quality, and I've found none better than the wireless RF system provided by Global Microwave Systems.

WORKS THROUGHOUT ARENA

Our GMS wireless system allows us to access our entire arena without signal loss or image degradation. Its performance is truly impressive. We use the GMS system to provide solid, glitch-free images, not only from the ice surface, but also from the concourses, outside the locker rooms, up in the catwalks and even outside the building.

Even though we have multiple units with different frequencies being used simultaneously inside the Arrowhead Pond of Anaheim during our events, we have not suffered signal interference of any kind. We also incorporate a wireless mic system with the camera using the same GMS signal to deliver live, roving reporter features without any audio delay.

The Global Microwave Systems digital transmitter in place and ready for action

The way the system works is simple. The GMS digital transmitter on the camera sends a digital signal to the receiver located high above the ice. The receiver then relays the signal back to the control room via fiber-optic cable. And since the unit is mounted to the camera itself, there is no need for an additional camera assistant.

LOTS OF PLAY TIME

We've been so satisfied with the GMS wireless system that we purchased a second unit and had it modified to fit one of our mini DV cameras. Both units only draw 9 watts, giving our cameramen plenty of play time.

We're also exploring options to outfit an additional unit onto our in-arena blimp.

In short, our GMS system is easily the best wireless system we've seen, and we're happy to recommend it. The support from GMS, on site and by telephone, has been as impressive as the system. On the rare occasion that the system needs maintenance, GMS is always there to make sure it is in top condition and ready for the next game.

GMS has taken our wireless camera capabilities during our events here at Arrowhead Pond to a whole new level. We're told, in fact, that this GMS on-camera system actually has a potential clear signal range of up to 5 miles. We're still working on a feature to take advantage of that. But in the meantime, when it comes to our event presentation, if you're either in, or anywhere near the building, we've got you covered!

Kent French is production manager for the Mighty Ducks of Anaheim, and is host and producer of "This Week in Angels Baseball." He may be contacted at kfrench@mightyducks.com.

For additional information, contact Global Microwave Systems at 760-496-0055 or visit www.gmsinc.com.

USER REPORT

Link Connects Hinn Ministries

By Woody Hukill
Location Engineer
Benny Hinn Ministries

IRVING, TEXAS

Pastor Benny Hinn holds events at large venues around the world. We've just returned from Fiji, where we had an audience of 100,000 in a single night. Most of Pastor Hinn's international events draw several hundred thousand people. Last year in India, we had more than 600,000 people in the audience each night.

DIFFICULT SHOTS

We need to capture what's going on from many angles, but the magnitude of these events makes it difficult to get close-up shots and creates extremely long cable runs. Wireless cameras make it possible to get in close or shoot from a great distance. This is what led us to look at wireless. It provides great flexibility and mobility. We bought two Link XP transmitters and receivers and took them to an event in Bangalore, India.

With the handheld wireless cameras, we got in close enough to provide a man-on-the-street point of view, actually walking into the crowds. Close-ups of faces and wide-angle shots from the back give a personal view of the event and show how people are responding. Wireless makes this possible, no matter how large the event.

Benny Hinn Ministries has gone from national to global and has made a considerable investment in equipment. We have a flypack system that travels with us worldwide. There is also a 53-foot truck for the events in the United States and Canada, as well as two studios in California, accommodating 350 people.

ROCK SOLID VIDEO

After a lot of research on wireless systems, we chose Link, as it offered a diversity system with low latency.

The video has been rock solid. Our editors have commented how good the video from our wireless cameras looks next to that from our wired cameras. The first time we used the wireless units in India, we just showed up with them new in the boxes. We didn't have a lot of setup time, so it was really assuring when we fired up the packages and everything worked.

The Link XP transmitter in use on a portable camera.

The flexibility of the Link XP is great. We run seven to 10 cameras, depending on the size of the event. Two of them are wireless. These two allow us to catch up with the hardwired cameras, so to speak. We have a video engineer constantly monitoring picture quality and color balance among cameras.

The wireless feature really helps a lot at large venues. We can put a camera at the very back of a crowd without laying miles of cable and we get some very striking pictures. Our greatest camera to control room distance was about 2,800 feet—more than half a mile.

There was an event at New York's Madison Square Garden with 25,000 people in the audience and more than 4,000 standing outside. The fire marshals had to close some of the areas down. When this happens, Pastor Hinn spends a few minutes speaking with the people who can't enter the arena. The TV audience needs to see what's going on and wireless camera technology makes it possible.

Every event is live-to-tape. With Link XP, we are able to get the video we need back to the control room. We're able to record it live and capture the real emotion and personal feel of being there.

Woody Hukill has been a broadcast engineer for 22 years. The opinions expressed are those of the author alone. He may be contacted at whukill@bennyhinn.org.

For additional information, contact Link Research at 310-373-2995 or visit www.linkres.co.uk

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.

REFERENCE GUIDE

SATELLITE ENCODERS

MANUFACTURER	MODEL	OUTPUT FREQUENCY RANGE	MODULATION TYPE	VIDEO ENCODING FORMAT	TYPE OF INPUT	FEATURES	SIZE & WEIGHT
Link Research 301-373-2995 *www.linkres.co.uk*	L1000	70 MHz	COFDM, QPSK, 8PSK, 16QAM, DVB	MPEG-2	SDI and analog	Under 20W power, low delay	1 RU or small form 3 lbs.
Radyne 602-437-9620 *www.radynecomstream.com*	HE4000	70/140 MHz and L-band	QPSK, 8 PSK, 16QAM, DVB-S2	MPEG	PAL/NTSC, SDI, HD-SDI	HD/SD simul-taneous enoding, front panel conf-idence monitors	2 RU 28 lbs.
Scientific-Atlanta 770-236-5000 *www.sciatl.com*	Originator D9150	52-88 MHz; 104-176 MHz	QPSK, 8PSK, 16QAM	MPEG-2	Analog and digital	On-board audio and video mod.; optional C/A and scrambling	2 RU, 40 lbs.
Scopus 609-987-8090 *www.scopusamericas.com*	E-1720	L-band	QPSK, 8PSK, 16QAM	MPEG-2	NTSC/PAL, SDI (optional)	VBI processing, up to 4 stereo/ 8 mono, very low delay	1 RU, 10 lbs.
Tandberg Television 678-812-6319 *www.tandbergtv.com*	E5788 HD DSNG	50 - 180 MHz, L-band	QPSK, 8PSK, 16QAM	MPEG-2	SDI, NTSC/ PAL	HD or SD encoding, HD bit rates up to 90 Mbps, adaptive noise reduction	2 RU 26 lbs.
Broadcast Microwave Services Inc. 858-391-3050 *www.bms-inc.com*	Truck-Coder II	70 MHz	COFDM, FM	MPEG-2	SDI, NTSC/PAL, YUV (optional)	Front panel Ethernet port, 100 user defined presets, digital and analog	2 RU, 12 lbs.

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USER REPORT

No Gambling in Reno with RF Central

by David Feher
Corporate Director of Engineering
Sunbelt Communications

RENO, NEV.

What exciting times! Sprint Nextel strikes a "deal" with the FCC on the relocation of 2 GHz ENG service and the conversion from analog to digital. Best of all, it's paid for by Sprint Nextel. As broadcasters, we were eager to participate in this transition, as it coincided rather nicely with the transition to DTV.

There are many manufacturers of ENG mobile transmitters, receivers, controllers, antennas, camera-mounted transmitters and many performance claims. Initially, we hadn't given much thought to camera-mounted transmitters but became intrigued after looking at several models.

We had many reasons for focusing on the RF Central product line. Probably most important was the easy adaptation of a portable transmitter pack to either a high-powered mobile transmitter or directly to camera battery mounting plates. This second configuration is ideal in situations where freedom of movement and good A/V quality are needed.

The 100 milliwatt transmitter is able to transmit up to two miles with regularity. In one case, we went 26 miles, with the transmitter strapped onto the ejection seat of a Russian MiG. Tracking was a bit difficult, but when the system was on target, it worked flawlessly.

COFDM IS A LIFESAVER

A common problem with live newsgathering is signal blockage by path obstructions. With analog microwave, many shots were impossible. Our COFDM ENG experiences over the past nine months have shown that we can do live links from locations not previously reachable. In fairness, COFDM is not unique to RF Central. However, their camera-mounted transmitter stands apart with its low-power consumption. Increased battery life also is a strong consideration. Our live shots have dramatically improved and we've expanded our horizons in getting special shots from the field. We also found that conventional methods in setting up for live shots no longer apply.

We are able to place the portable digital microwave transmitter, the RFX-PHT, in any vehicle with an external mag-mount antenna, go to a location, power up and have the receive site point its antenna in the general vicinity. The result is perfect audio and video.

INSTANT ENG

With the mag-mount antenna attached to the vehicle, the reporter and photographer can go virtually anywhere, including tight spaces such as parking garages and areas with overhead high-tension wires that would preclude "masting-up" in a conventional ENG vehicle. This ordinary vehicle can actually transmit while en route to a breaking news scene, thus providing real-time reporting during the drive. This allows coverage of events that are highly mobile—from parades to police chases.

An RF Central transmitter on a MiG ejection seat

Recent testing included transmission from a helicopter, using the high-powered transmitter and an FAA-approved externally mounted antenna. A two-hour test was conducted, with a recording being made in the camera and another at the station. Once the flight was completed, the recordings were compared to see where and when any dropouts or glitches occurred.

This test involved circumnavigating the Reno, Nev. metro area out to 30 miles. There were several glitches, but they only took two forms—one occurred when the video plug on the camera was disconnected and the other happened when the tracking antenna was incorrectly aimed during some rather dynamic helicopter maneuvers. At no time did we experience a situation where the RF Central equipment was at fault.

Our experiences with RF Central equipment have all been positive. There were some cases of receiver malfunctions and these have been and continue to be addressed by the RF Central staff. The company's assortment of products and their "fast attack" customer service are a most beneficial addition to any TV broadcaster and ENG operation.

David Feher has been in radio and TV broadcasting and related engineering fields for 40 years. He is now corporate director of engineering for Sunbelt Communications Inc. which owns NBC affiliated TV stations in several western states. He may be contacted at dfeher@krnv.com

For additional information contact RF Central at 717-249-4900 or visit www.rfcentral.com.

BUYERS BRIEF

The IRD-2900 line from **Scopus Video Networks** is a series of professional MPEG-2, DAV and ATSC integrated receiver/decoder devices. They are designed for satellite and telecom distribution as well as for transport stream monitoring and are available with a variety of input options, including MPEG over IP. The IRDs offer both SDI/AES and analog outputs and provide genlock and GPI capability. Units are equipped with an Ethernet port and can provide up to four channels of audio ouput, supporting Musicam, Dolby Digital AC-3, as well as linear PCM. The IRDs are capable of demodulating NTSC, PAL and SECAM television signals and offer users a graphical front-panel display.

For more information, contact Scopus Video Networks at 609-987-8090 or visit www.scopus.net.

USER REPORT

WPRI Bolsters News Operations with MRC

by Bill Hague
Engineering and Operations Manager
WPRI/WNEC

PROVIDENCE, R.I.

As the winner of Associated Press News Station of the Year awards in 2004 and 2005, WPRI Eyewitness News is operating at an extremely high capacity. Our station provides 24-hour service to the Providence-New Bedford market. Along with the honors came increased competition, and the need to stay ahead. We needed to increase our on-the-spot newsgathering capability and the number of shows we were airing. The only way to meet that goal was to increase our field capability with additional ENG vans equipped for live remote coverage.

We discussed our past experiences with various ENG vendors and ultimately contacted Microwave Radio Communications in North Billerica, Mass. to help us equip the new vans. We've been relying on MRC equipment in our day-to-day operations for some time, and were confident that they could support our latest requirements, without the need to test their equipment in advance.

We purchased the MRC CodeRunner 2 ENG microwave transmitter and ProStar ENG van antenna, and opted for solid-state feed switching to reduce the possibility of failure in that area. The CodeRunner 2 offers switchable analog and digital COFDM transmission modes in a single unit. We are currently transmitting in analog, but have the capability to make the switch to digital when we're ready. The MRC equipment is also helping to shorten and streamline our transition in the Sprint Nextel BAS relocation. After completing a final Sprint Nextel inventory, much of the equipment we purchased in the last five or six years is eligible for upgrades, while many of our older radios must be replaced.

With the increased pace of our newsgathering, we also had to streamline our workflow. For our ENG receive sites, we selected the CodeRunner 4 analog and digital central receivers along with Troll remote control systems. We chose a different antenna model for each receive site to suit specific needs. The array of antennas includes the SectorScan II for low-profile downtown applications; the full-size ProScan III for high gain, 360-degree rotating coverage; and the smaller UltraScan DR II for its high performance offset feed.

The integration of MRC CodeRunner 4 receivers, antennas, and controller resulted in increased newsroom efficiency by speeding up the access to ENG sites, and by allowing quicker signal acquisition from the five vans we now have on the road. The system provides source-to-source control, which enhances reliability at the ENG receive center.

The Microwave Radio Communications CodeRunner ENG link

USER-FRIENDLY INTERFACE

In operation, we found the CodeRunner user-friendly interface and range of software control to be very well designed and useful. In our view, this is a great technological development, given that previous radios had to be opened up to make routine adjustments.

Being adjacent to the Boston market puts WPRI in a highly competitive environment. We are constantly looking for tools that make it easier to achieve our news and programming goals. Thanks to MRC, the entire process of purchasing and using this equipment has been hassle free. What we asked for is what we received, and it was tailored to our requirements. Our ENG systems have met and exceeded every expectation, from reliability to helpful operating hints, to 24/7 service, every day of the year.

Bill Hague has a long history in the broadcast industry. He has been with WPRI for over 20 years and is currently director of engineering and operations. The opinions expressed are those of the author alone. He may be contacted at whague@wpri.com

For additional information, contact Microwave Radio Communications at 800-490-5700 or visit www.mrcbroadcast.com.

COMPANY PROFILE

SES Americom: 30 Years of Innovation

by James E. O'Neal

PRINCETON, N.J.

Nowadays there are a lot of companies out there with "com" as part of their name. Most are survivors from the "dot-com" industry group that sprang up in the 1990s. SES Americom is quite a different sort of "com," with very solid roots that have been growing for three decades. The company is in the midst of a yearlong 30th anniversary celebration of tradition, technology, innovation and people who have fueled its rich heritage of success.

RICH HISTORY

The beginning of SES Amerocim can be traced to the purchase of the Alaskan Communication System from the U. S government in 1970s by RCA,

December, 2005 launch of an SES Americom satellite using a Russian Proton Rocket

SES Americom's corporate predecessor. This early move in the age of communications satellites led to the construction and launch of a four-satellite system. The company's first new spacecraft, Satcom F1, was launched in 1975—just after Americom played a key role in the broadcast of the "Thrilla in Manila" Ali-Frazier heavyweight bout, which spelled the beginning of the cable television industry as we know it today. Early in 1976, HBO took the initial step in launching national programming distribution by satellite with the lease of transponder space from Americom.

The company continued to grow and prosper as satellite communications moved to the forefront. In 1986, GE purchased the 60-year-old communications giant, and RCA's satellite division became known as GE Americom. The 1980s and 1990s saw continued growth and prosperity for the company, with a venture into the international communications market in 1995. By the end of the millennium, GE Americom was providing C and Ku-band communications to customers throughout the world.

SES entered the picture in 2001, acquiring GE's Americom division and in doing so, becoming the world's largest operator of commercial satellites. Today, SES Americom is part of the SES Global network of satellite operations.

SES Americom and its precursors have a solid reputation for innovation and service, with such achievements as the launch of the first direct broadcast satellite, the first company satellite

AMERICOM, PAGE 49

Americom

CONTINUED FROM PAGE 48

launched from the space shuttle and the launch of the most powerful Atlantic Ocean Region C-band satellite ever placed into service, AMC-12.

The primary focus of the company from the beginning has been on customer service—in broadcasting, cable, enterprise, government services, and most recently, in IPTV and mobile television.

SES Americom operates five major teleports in the United States and Europe, and has more than 120 antennas in use. The present fleet of satellites stands at 18 and is growing; more launches are planned to meet the growing demand for HD, IP-based technologies and global connectivity.

The company is positioned for the future, thanks to its forward thinking and one-on-one relationships with its customers.

"We not only have the right technological connections, but the right industry and market connections and insight to meet our customers' evolving needs," said Ed Horowitz, SES Americom CEO. "As a result, SES Americom has the distribution platforms to deliver on our customers' dreams and vision today and tomorrow."

Whether it's enabling telephone companies to bundle IPTV with voice and broadband, introducing programmers to new audiences viewing their favorite shows on cell phones and other handheld devices, or continuing to expand a the satellite fleet and content delivery network that the broadcasting and cable worlds have come to know, SES Americom is clearly focused on helping its customers find success in traditional and bold new markets.

SES Americon

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www.ses-americom.com

BUYERS BRIEFS

The PT-HD3-S2 from **Telemetrics** is a heavy duty remotely controlled camera pan and tilt head designed for all-weather applications. The unit features 355-degree panning ability and a 110-degree tilt range. It is design to support and be controlled by the company's weatherproof housing units. The PT-HD3S2 has precision position encoders for high recall accuracy and uses 24 V DC servo controlled drive motors which provide 90-foot-pounds of drive torque. The head can support camera loads of up to 90 pounds. It may be operated in either upright or inverted positions.

For more information, contact Telemetrics Inc. at 201-848-9818 or visit www.telemetricsinc.com.

The CLNB20-PL10 from **DawnCo** is an antenna mounted C-band satellite low noise block converter/amplifier with a 3.4 GHz to 4.2 GHz input range. It has a noise temperature of 20 degrees. The LNB features high frequency stability and is hermetically sealed. The device is designed to mount directly to a C-band satellite antenna feed and comes with a CPR229G flange. The L-band output connector is a 75 ohm "F" fitting. The LNB features an output VSWR of 2.2:1 and has a phase noise specification of –75 dBc/Hz. The device requires 15 to 24VDC at 350 milliamps.

For more information, contact DawnCo at 248-391-9200 or visit www.dawnsat.com.

USER REPORT

Frontline, NSI Leap to KTVK's Rescue

by Tom Heidinger
Satellite News Manager
KTVK Television

PHOENIX

It was over in the blink of an eye. A compact car ran a red light and T-boned our best microwave truck. The KTVK ENG/EFP truck that could transmit two paths and support two crews went from a daily workhorse to large pile of scrap. Luckily, no one was badly hurt.

KTVK TV3 is a Belo-owned, independent station that has been operating since 1955. This is a very competitive market with seven stations doing daily news broadcasts. News is our bread and butter; we do eight hours a day and feed a 24-hour cable station. We needed to replace this major loss to our ENG capability very quickly.

Before the crash, we had many meetings to discuss and plan the BAS conversion. Suddenly those discussions about "being made whole" and seemingly impossible timetables, were transformed into something that had serious ramifications and was very immediate.

We assessed our needs, starting with what we had to have right now. We needed a truck that would be optimized for single-person operation, and serve as a mobile office, edit bay and transmission center. We also decided to build a truck that would take advantage of all that COFDM could offer.

We started with a Frontline high-top chassis, as we have had much experience with Frontline. The quality of construction and design has always been high and the extensive documentation and support that Frontline provides has kept our trucks safe, functional and on the road. Having such expertise was very reassuring.

Microwave receive sites in our market mostly ring the metro area. The consensus here is to avoid omni-directional transmit antennas. With that and our frequent back-to-back live shots in mind, we had to guard against one transmitter lighting up all receive sites. This meant a directional antenna. We wanted one that could be aligned without depending heavily on a signal strength meter. These requirements, and our experiences with N Systems led us to investigate that company's Nupod and Quicklift models. These gave us the antenna performance we wanted, plus a fast deployment system that came without the concern for power line contacts. The antenna controller is powerful and flexible and uses an electronic compass and GPS receiver to enable the use of presets for antenna pointing. The menu system is easy to navigate and aiming is fast and accurate. Some fine tuning may be required, but the preset system works quite well and gets you close enough so that the final adjustment is relatively easy.

GPS/WAN ASSIST

It was at this point that we decided to tie everything together.

Tom Heidinger with the new KTVK ENG/EFP truck

We used a Pinpoint 1XRTT modem for wireless Internet access and AVL data. This, coupled with a Cisco MAR 3200 router, extended the station WAN to the truck and allowed remote control of the truck antenna. With the system, the NSI MC5 controller would know where the truck was and could point any of our four NSI Superquads right at it. The operator at the station could then fine tune the transmit antenna. The MC5 already controlled our Nucomm central receivers.

We wanted the MC5 to control the Nucomm VT1 transmitter in this truck as well. Nucomm and NSI dedicated a lot of time and equipment in making this work. The Pinpoint modem has a scheduled upgrade to EVDO this month. At EVDO speeds, I expect the mobile network in the truck to allow the use of many of the same tools we have in the newsroom—iNEWS, wire access, e-mail and the Internet, as well as use of networked printers.

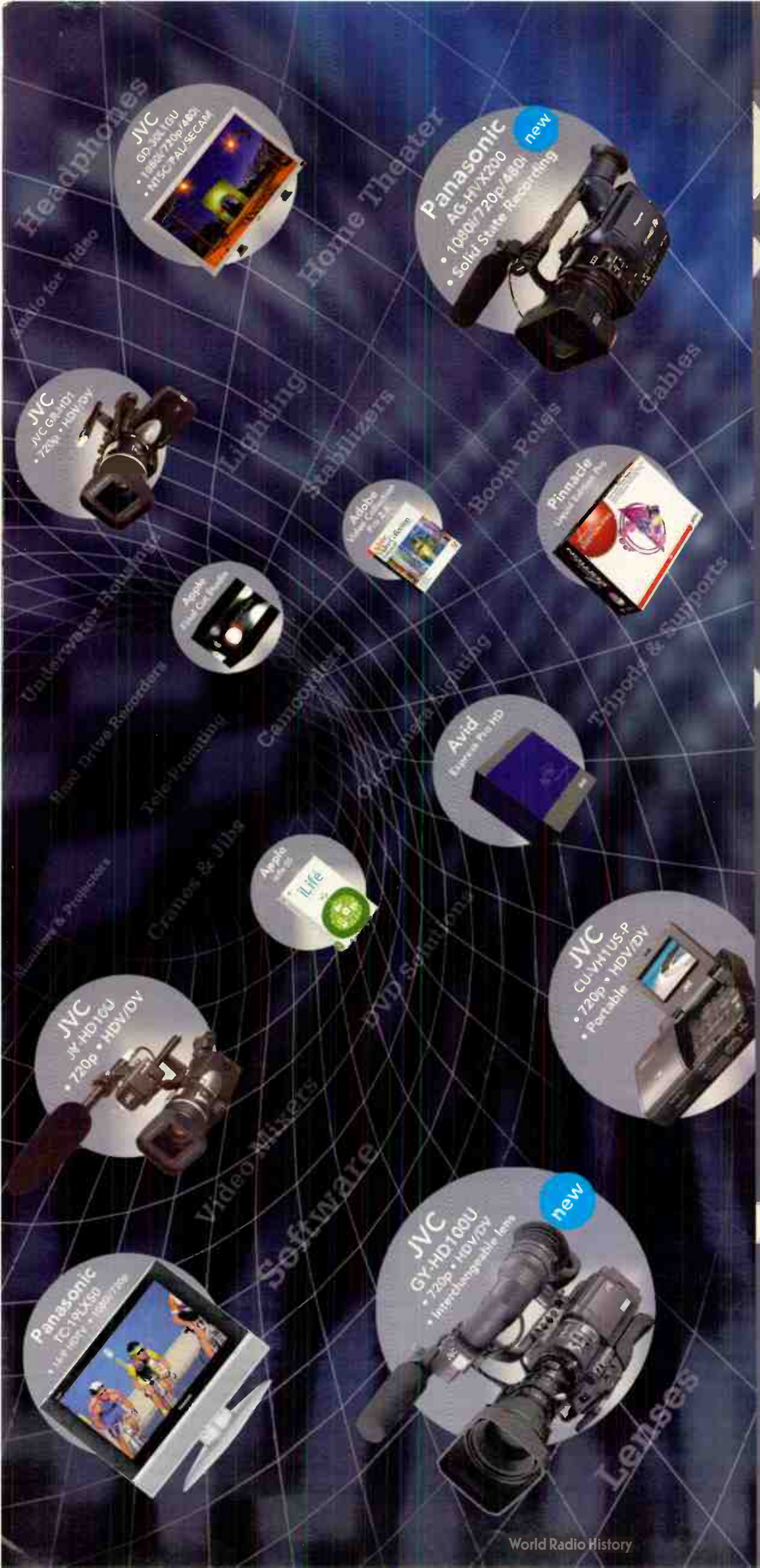
The Frontline engineers, fabricators and salesmen faced many challenges to integrate all these systems. One solution involved building an interface for the truck NSI antenna controller that would also control a television camera mounted on the roof rack for use during drives to live shots.

When the crew arrives, they power up and deploy the antenna. Then they can go shoot the story or set up the live shot. The ENG control point turns on the transmitter and aligns transmit and receive antennas. They can also select the roof camera on the switcher and move it to a scene shot if needed. They can also power it down until that live shot is needed.

We have two more of these trucks under construction at Frontline right now and are looking forward to getting them on the road and into the daily fight.

Tom Heidinger has been with KTVK since 1986 and has worked in the Phoenix market since 1982. The opinions expressed are those of the author alone. He may be contacted at tom_heidinger@azfamily.com.

For additional information on the KTVK vehicle, contact Frontline Communications at 727-573-0400 or visit www.frontlinecomm.com. *For additional information on the KTVK ENG microwave equipment and systems, contact N Systems Inc. at 510-964-8400 or visit* www.nsystems.com.



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USER REPORT

Moseley Makes Digital Easy

by J. D. Bruffy
President
DBK Communications Ltd.

SCOTT DEPOT, W.V.

The transition from analog to digital operations is foremost in our minds and finances. We recently received a request from KMVT in Twin Falls, Idaho, to provide a system for transporting four program sources to the transmitter plant and also providing a return for ENG purposes. The path was approximately 10 miles long and RF congestion at the site was fairly high.

This was a replacement for an older system and was to be fully digital. Another consideration was for the system to be component based to allow expansion by a simple change of encoders and decoders. A diversity of data input types (ASI, DS3, and SMPTE 310 streams, as well as Ethernet/LAN) were to be incorporated into the basic design. Easy integration into existing systems was important to minimize downtime and complications.

The Moseley Associates DTV Link

MOSELEY DTV SYSTEM SELECTED

We investigated several microwave systems before identifying a supplier that could provide a simple and cost effective system with excellent reliability. The choice was the Moseley and Associates DTV Link. The system met all of the criteria and provided excellent flexibility for future technology changes.

The Moseley system accommodates SMPTE 310, 2-ASI, or a DS-3 input at up to 45 Mbps throughput. Depending on channel conditions and path length, the system could operate at a much higher data rate. This option allows maximum performance for dollars invested.

The desired system configuration was set for 19.3 Mbps and the multiplexing of three video sources with stereo audios into one ASI stream. The ASI encoders were set at 7.5 Mbps, with excellent 480i operation. These three channels feed the existing NTSC channel and two LPTV transmitters. The system was set for 55 Mbps to allow ample channel capacity.

When we received the Moseley equipment, we first set it up for bench testing. Just as expected, everything worked straight out of the box. We left everything running overnight to spot any problems. Perhaps a longer period for this would be better, but many stations do not have the time.

QUICK AND EASY INSTALLATION

The equipment was racked up quickly and with the simple connection of a single flex cable, we were ready to make pictures.

The system went on line without a hitch. Some adjustment of transmitter plant equipment had to be done, but there were no difficulties. It might seem an exaggeration to state that everything worked perfectly over the next few days, but it did.

A few gremlins did appear after a few days, but the manufacturer was quick to respond and resolve the issues.

The biggest difficulty was the latency between source and final product, but this is normal and will be something we adjust to. It's a product of the encoders and decoders. As the technology advances, I would expect that the latency would be reduced.

The Moseley radios provided a complete digital solution with excellent performance, fair price and quality workmanship, and carriy one of the most revered names in broadcasting.

J. D. Bruffy is a veteran telecommunications and broadcast engineer with more than 40 years experience. He is president of DBK Commmunications Ltd. He may be contacted at jdb@dbkcom.com.

For additional information, contact Moseley Associates Inc. at 805-968-9621 or visit www.moseleysb.com

BUYERS BRIEFS

Modular Integrated Broadcast Systems from **Radyne** are a series of portable and fully redundant C-or Ku-band satellite or terrestrial SD or HD video transmission terminals for broadcasting applications. The systems are packaged in flyaway containers for convenience in transport, set-up and operation. The packaged systems have integrated confidence monitoring and patchable configurations for quick and convenient troubleshooting and re-configuration in the field. The MIBS units are optimized for reliable delivery of HD MPEG, DVB or ATSC video signals over either satellite or terrestrial circuits.

For more information, contact Radyne at 602-437-9620 or visit www.radn.com.

The D-TECT AC field detection system from **Will-Burt** is a safety device designed to provide indication of AC fields, object proximity detection and tilt sensor detection for ENG van applications. The unit provides critical safety information to operators when extending masts. The D-TECT features a spotlight for illuminating overhead objects. It offers immediate warning to operators if AC power lines is detected. A tilt sensor ensures awareness of non-level vehicle conditions. The system also includes a sensor that automatically stops mast deployment if potential for mechanical interference is detected.

For more information, contact The Will-Burt Company at 330-862-7015, or visit www.willburt.com.

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TV TECHNOLOGY

Shure A268 new rack mount kit for Shure M267 mixers, $10; Altec 1594A (2) 100W solid state amplifiers w/manual, mint cond, $100/ea.

CAMERAS

Want to Sell

Sony DXC-D30 w/PVV-3 docking camcorder, $8500; Sony DXC930 color video camera, $2995; Sony DXC990 color video camera, $3995. 818-788-4700 or 212-564-9933 or www.tvprogear.com.

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Amp'd Mobile Truck Streams Live Sports To Mobile Phones

In January, Amp'd Mobile hired TV Pro Gear, to design and build the first video truck optimized for streaming video to cell phones. The truck had to be completed in only three weeks in order to shoot the West Coast leg of the AMA Supercross Series in Phoenix, Anaheim and San Francisco.

The all digital truck features a Panasonic MX-70 switcher, two Panasonic AJ-SD93 DVCPRO 50 recorders and a Miranda Kaliedo screen splitter feeding a 50" Panasonic Plasma display. Editing, graphics and effects are handled by multiple Mac G5's running Final Cut Studio tied via fiber to an Apple X-Serve Raid.

MICROWAVE/STL

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MISCELLANEOUS

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Leitch FR-684 Dual PS 2RU Frame, $295; Leitch FR-884 Dual PS 2RU Frame, $295: Leitch Mix-7001 Multi-function digital frame, $400; Leitch 6804 Mounting Frame w/Pwr sply, $250; Leitch SPG-2602N Pulse Gen, $1,250; Sony BVX-D10/BVR-11, $3,990; Leitch DPS-290 Component TBC, $1,800. 818-788-4700 or 212-564-9933 or www.tvprogear.com.

Videotek VDA-16 (3) video DA 1x6 in rack frame, $125; Dynair Mini-Mop video EQ, can equalize up to 4000' of coax, $40; Dynair 1510B, 1 in 4 out video DA, xlnt cond, $40. A Ross, 425-775-8853.

STATIONS

Want to Sell

LPTV CP, channel 59. Rehoboth Beach, DE. Investors wanted. 478-741-1710 or wrecktech@yahoo.com

SWITCHERS

Want to Sell

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

TELEPROMPTERS

TEST EQUIPMENT

Want to Sell

Lenco PVS 430 videoscope, displays SC/H relationship for system timing, w/manual, $75; Tektronix rack frame for 2 waveform monitors, $75. A Ross, 425-775-8853.

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

Want to Buy

Low cost spectrum analyzer for FM band, Tek plug-in okay. Chris Hood, 5 Harrison St, Crafton, PA 15205.

TEST AND MEASUREMENT

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.

VIDEO TAPE TRANSFER

VTRs/VCRs/ RECORDING MEDIA

Want to Sell

Sony PVW 2800 Betacam SP edit deck, great working cond, looks good too, $3900/BO. Video Graphics Inc, 724-836-0566.

Sony UVW-1800 BetacamSP, $4850; Sony PVW-2800 BetacamSP, $4950; Sony BVW-70, $5000; Panasonic AJ-SD93 DVCPRO 50, lw hrs, BO; Sony DSR-2000, B-stock, $13500; Sony VO 9850 w/timecode, $1200; Sony VO 9800 w/timecode, $1000. 818-788-4700 or 212-564-9933 or www.tvprogear.com.

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AZCAR, a major system integration firm, seeks highly motivated individual to run Business Development. Experience in system engineering and sales management important. Staff of about 10. Marketing and advertising responsibilities along with personal involvement in major accounts. Salary, commission, override and bonus plans. Excellent benefits. Relocation Allowance. Commitment to growth, client service, and solid team work important. Communications skills and public speaking must be strong suits. Modest travel required. Position filled before NAB. Send expression of interest, resume and references to VPBD@AZCAR.com.

Broadcast Maintenance Engineer: WMCN-TV in Atlantic City is seeking an individual to perform diagnostics, trouble-shooting, routine and preventive main-tenance on all broadcast and other systems at TV station. Associate's degree and two years experience required. Bachelor's degree preferred. Valid driver's license. Full-time. Salary plus benefits. Evening and weekend hours required. EOE. Send Resume and salary history to; WMCN-TV, attn: Gen. Mgr., 19 S. New York Ave., Atlantic City, NJ 08401. Or fax to: (609) 441-9559. E-mail to blund@wmcn.tv.

National Mobile Television, a leader in sports entertainment broadcasting, has openings for engineer in Charge (EIC) in Miami, Florida and the New York/New Jersey area.

About the Position

The EIC is responsible for the overall management, operation and quality of a mobile broadcast unit. 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.

Do you have what it takes?

This position requires a comprehensive understanding of Analog/SD/HD video and audio broadcast systems. 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.

Are you interested?

If you meet the stated qualifications and are interested in applying for consideration, 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.

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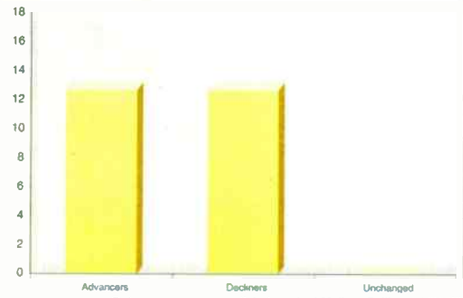

TOP ADVANCERS BROADCAST STOCKS
(Feb. 3 - Feb. 17)

Univision	+ 8.35%
Tribune	+ 5.77%

TOP DECLINERS BROADCAST STOCKS
(Feb. 3 - Feb. 17)

Emmis	- 7.32%
Paxson	- 6.38%

TOP ADVANCERS TV STOCKS
(Feb. 3 - Feb. 17)

Tektronix	+ 8.46%
LSI Logic	+ 5.18%

TOP DECLINERS TV STOCKS
(Feb. 3 - Feb. 17)

Belden	- 4.53%
Harmonic	- 0.85%

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

TV Tech STOCKS as of February 17

Company Name	52-Week Range	Feb. 3	Feb. 17	% Change
Avid	35.78 - 68.35	47.42	47.50	0.17%
Belden	17.65 - 27.72	26.94	25.72	-4.53%
Ciprico	3.70 - 6.06	5.74	5.96	3.83%
Harmonic	4.08 - 11.70	5.85	5.80	-0.85%
Harris	27.25 - 48.79	46.76	47.83	2.29%
LSI Logic	5.01 - 10.75	9.08	9.55	5.18%
S-A	26.73 - 43.90	42.79	42.91	0.28%
Scopus	5.80 - 8.35	6.96	7.14	2.59%
SeaChange	5.07 - 14.30	9.02	9.39	4.10%
Tektronix	20.97 - 31.69	28.96	31.41	8.46%

Broadcast STOCKS as of February 17

Company Name	52-Week Range	Feb. 3	Feb. 17	% Change
Acme	3.30 - 6.19	3.75	3.57	-4.80%
Belo	20.74 - 24.96	22.46	21.70	-3.38%
Emmis	15.29 - 24.49	18.30	16.96	-7.32%
Entravision	6.80 - 9.50	7.00	7.25	3.57%
Fisher	41.43 - 52.60	42.64	43.25	1.43%
Gray	8.24 - 15.45	8.89	8.55	-3.82%
Hearst Argyle	23.15 - 26.34	23.83	23.77	-0.25%
Nexstar	3.93 - 8.25	4.45	4.23	-4.94%
Lin TV	9.77 - 18.15	10.62	10.12	-4.71%
Paxson	0.37 - 1.56	0.94	0.88	-6.38%
Sinclair	7.35 - 10.07	8.15	7.86	-3.56%
Univision	23.52 - 35.65	31.24	33.85	8.35%
Young	1.70 - 9.53	3.65	3.56	-2.47%
Tribune	28.40 - 42.02	29.28	30.97	5.77%
Meredith	44.51 - 55.67	53.85	55.41	2.90%
EW Scripps	44.85 - 52.91	49.94	49.88	-0.12%

Tandberg to Acquire SkyStream for $80M

SOUTHAMPTON, ENGLAND; SUNNYVALE, CALIF.

Tandberg Television is purchasing IP technology developer SkyStream for $80 million in cash and stock. The acquisition, which is expected to close in April, will expand Tandberg Television's technology and services for IPTV, cable, satellite and on-demand markets.

"The sands are shifting in the digital media market and there is an inevitable level of industry consolidation taking place. In a marketplace with a number of acquisition opportunities to pursue, we chose to acquire SkyStream because of the company's best-in-class technologies and its strong culture of building revenue and profitable growth," said Eric Cooney, president and CEO of Tandberg Television.

SkyStream's products include high density Mediaplex-20 and iPlex switched digital video headends for MPEG-2 and MPEG-4 AVC encoding and transcoding. The company has about 100 employees in North America and the United Kingdom, China and Korea. It has more than 300 customers worldwide including Safeway, Reuters, EchoStar Communications Corp. and Comcast.

Scientific-Atlanta to Buy UB Video

ATLANTA, VANCOUVER, B.C.

Scientific-Atlanta has acquired UB Video Inc., a Vancouver, B.C.-based provider of advanced compression technologies for digital video encoding. Financial terms of the agreement were not disclosed.

The deal unites the two companies who have collaborated over the past two years to develop an advanced digital video encoding technology. The codec, called "UBLive-264MP-C64" is optimized for the H.264 (AVC) standard, providing up to 50 percent bit rate savings compared to MPEG-2 and giving service providers a choice in rolling out advanced interactive services and HDTV programming.

"Broadcasters and service providers alike are looking for ways to deliver high-performance, high-quality video, and the market for this need is expanding at an accelerated pace," said Dr. Faouzi Kossentini, founder of UB Video. "The combination of UB Video's cutting-edge software and Scientific- Atlanta's proven leadership in video delivery is a win-win technology combination, which will give service providers a world-class solution for today's complex networks."

"This combination will provide significant benefits to our customers worldwide as they roll out new and advanced standard- and high-definition programming services to satisfy consumer demand," said Dean Rockwell, vice president and general manager of Digital Media Networks, Scientific-Atlanta.

Scientific-Atlanta is being acquired by Cisco Systems. The—deal—announced in November is undergoing scrutiny by federal regulators and authorities outside the United States.

Despite Q4 Loss, LIN TV Posts Overall '05 Gain

PROVIDENCE, R.I.

LIN TV Corp.'s latest financial returns point to a mixed revenue picture for 2005. Although the company posted a fourth quarter loss, it reported an overall gain in revenues for the year.

The company lost $27.8 million in Q4 or 54 cents a share compared to a year earlier net income of $62.2 million. Net revenues rose to $111.5 million over 2004's fourth quarter results of $108.1 million.

For the year, the company posted a slight increase in net revenues of $380.4 million compared to 2004 net revenues of $376.7 million. LIN TV executives attributed the mixed results on its purchase of seven TV stations last year.

"The increase in revenues was driven principally by the acquisition of the UPN affiliated stations in Indianapolis and Columbus we acquired in March, as well as the five stations we acquired for Emmis Communications in November," said Gary Chapman, LIN TV's chairman, president and CEO.

The company completed its acquisition of the four Emmis stations in December for $257 million and agreed to buy a fifth station for an additional $3 million. The company owns 30 TV stations in all.

Chapman said he may not convert LIN's WB and UPN affiliates to the new CW network, a joint project between CBS and Time Warner. He said there may be better revenue opportunities elsewhere and is considering taking the seven stations independent. The stations account for 9 percent of LIN's revenue.

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