

TV TECHNOLOGY

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VOLUME 25, NO. 2 • JANUARY 24, 2007

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What's Next for DirecTV? Malone's purchase opens doors for deals

by Gary Arlen

Special to TV Technology

BETHESDA, MD.

Could John Malone sell a second multi-channel carrier to AT&T? Or will he merge his newly acquired DirecTV into EchoStar now that DBS growth has plateaued?

Does the media mogul's 32 percent stake in WildBlue Communications, the satellite Internet access provider, bode new broadband capabilities? Or will Malone's long-standing interest in interactivity shape a vertically integrated colossus?

What if he ties DirecTV's satellite bandwidth with emerging wireless systems, such as WiMax, to compete with local cable and telco TV? Or will the notorious deal-maker merely want to use DirecTV to distribute the extensive portfolio of digital content from his Liberty Media Corp., which now includes a new Hollywood studio?

Ever since Malone and fellow/rival mogul Rupert Murdoch swapped holdings just before Christmas, speculation has flourished about Malone's plans for DirecTV, the nation's largest DBS (direct broadcasting satellite) operator. Liberty Media, which Malone heads, abandoned its 16.3 percent stake in News Corp. in exchange for 38.4 percent controlling interest in DirecTV Group Inc. plus three regional

DIRECTV, PAGE 8

ANALYSIS

CBS Captures Super Bowl XLI

More than 50 cameras, from high-speed to slo-mo will bring more HD coverage

by Robin Berger

MIAMI

CBS is pulling out all the stops in its coverage of what is expected to be the biggest broadcast of the year: Super Bowl XLI at Miami's Dolphin Stadium, Feb. 4.

"It's a monster show," said Ken Aagaard, CBS Sports vice president of operations and production. "We've added five or six cameras just for our basic coverage—we're going to make sure that we have the game covered properly."

CBS estimated it would use about 50 cameras for game coverage (not including the network's "NFL Today" pregame show). Concurrently, NFL indicated that about 10 foreign rights holders have contracted an HD feed.

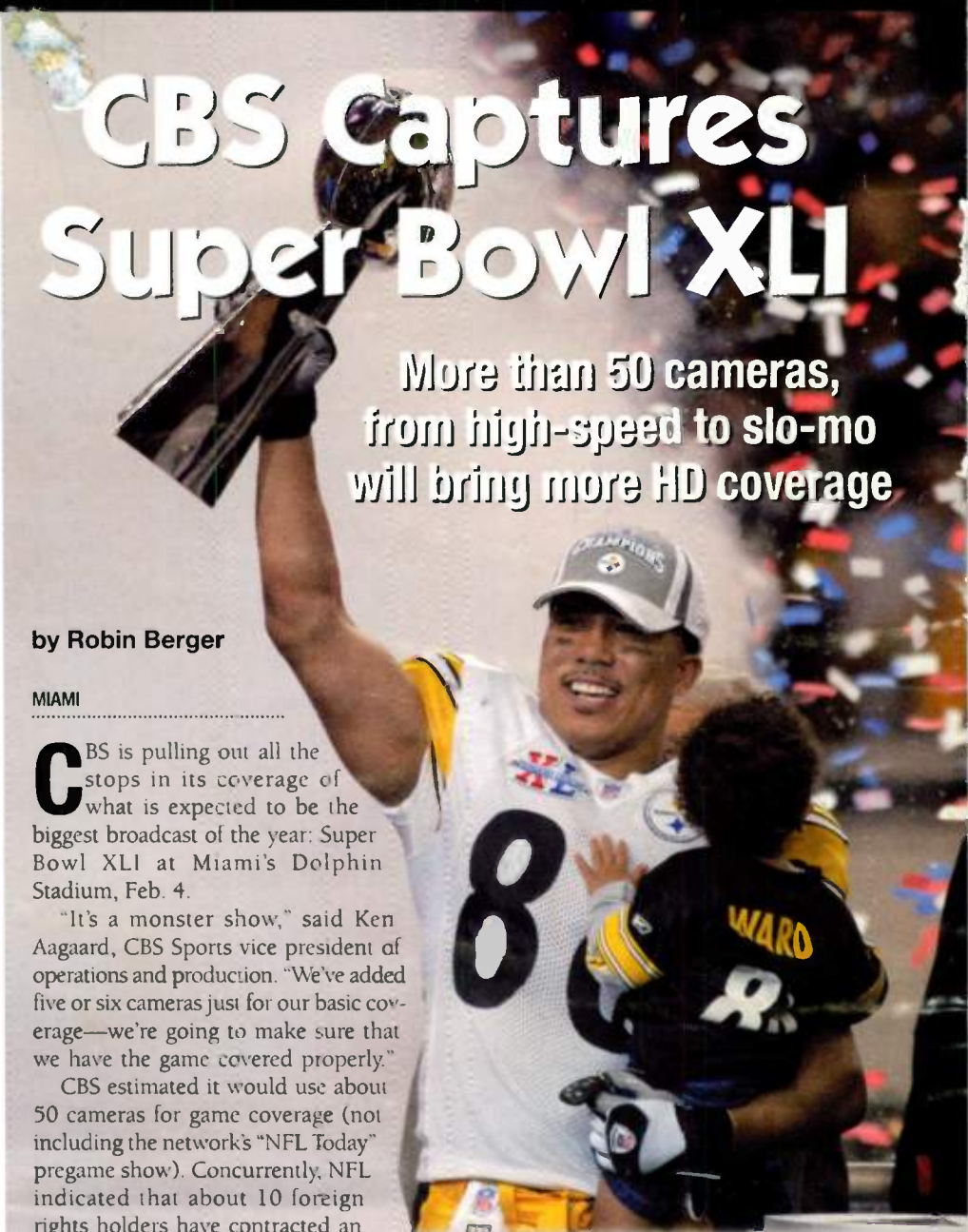
Stateside there's an even greater emphasis on providing details of critical plays.

Six of Sony's HDC3300 3x high-resolution slo-mo cameras will be used (see "NFL Takes Slo-mo Hi Def," in the Jan. 10, 2007 issue of TV Technology for more details).

According to Aagaard, four hard configurations of this model will be in the two end zones, and two handheld versions will roam the field—one on the far side, one on the near side of the action.

CBS will also add two different high-speed

SUPER BOWL, PAGE 16



SUNDAY NIGHT SWITCHES TO SONY.

SONY

Switchers

The Sunday night pro football broadcast has moved to NEP's newest mobile unit, the ND3HD, and the Sony MVS-8000A switcher. "Sony is really staying ahead of broadcaster requirements," says George Hoover, senior vice president of engineering for NEP. "And the MVS is extremely reliable. It's a great machine."

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World Radio History

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when reliability counts.

Panasonic ideas for life

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On the cover: Pittsburgh Steeler and Super Bowl MVP Hines Ward holds the Lombardi Trophy and his son, Jadon, after the Pittsburgh Steelers defeated the Seattle Seahawks 21-10 in Super Bowl XL at Ford Field in Detroit, Feb. 5, 2006. Photo: Pat Benic/UPI/Landov

CONTRIBUTING WRITERS

Focus on Editing

Jay Ankeney



The beginning of a new year is a time to look forward. So for this year's "Editor's Wish List," I was able to harvest some terrific suggestions from a variety of innovative post pros about what they would like someone to come up with to make their post-production workflow... p. 32

The Big Picture

Frank Beacham



One of the more ludicrous side effects of writing this column for TV Technology is that so many people think it qualifies me to fix whatever problems they are having with their home television set. When the actor quips "I'm not a doctor, I just play one on TV..." p. 42

World Radio History

Gary Arlen

Tuning In



As America's newspapers reinvent themselves, broadband video—including high definition—is part of their arsenal, raising prospects of newspapers becoming significant local online HDTV purveyors. From the San Diego Union-Tribune to The Washington Post... p. 44



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Testing Canon's new
HDV camera

Telephone: (703) 998-7600
Editorial fax: (703) 820-3245
e-mail: tvtech@imaspub.com
Online: www.tvtechnology.com

The staff can be contacted at the phone extensions listed or via e-mail using first initial, last name @imaspub.com

Publisher: Eric Trabb
732-845-0004
Associate Publisher: Marlene Lane
ext. 128

Editor: Tom Butts
ext. 122
Managing Editor: Deborah D. McAdams
ext. 177
Technology Editor: James E. O'Neal
ext. 150
Associate Editor: Melissa Sullivan
ext. 149

News Correspondents: Susan Ashworth, Robin Berger, Ken Freed, Mary Gruszka, Craig Johnston, Claudia Kienzie, John Merli and Sanjay Talwani

Production Director: Davis White
ext. 132
Publication Coordinator: Carolina Schierholz
ext. 125
Ad Traffic Manager: Lori Behr
ext. 134
Classifieds/Product Showcase Coordinator: Linda Sultan
ext. 109

Ad Coordinator: Caroline Freeland
ext. 153
Circulation Manager: Kwentin Keenan
ext. 108

President: Stevan B. Dana
ext. 110
CEO: Carmel King
ext. 157
Chief Financial Officer: Chuck Inderrieden
ext. 165
Editorial Director: T. Carter Ross
ext. 120

TV Technology (ISSN: 0887-1701) is published semi-monthly with additional issues in April and May by IMAS Publishing (USA) Inc., 5827 Columbia Pike, Third Floor, Falls Church VA 22041. Phone: (703) 998-7600. FAX: (703) 998-2965. The international edition is published monthly along with the month's second domestic edition. Periodicals postage paid at Falls Church VA 22046 and additional mailing offices. POSTMASTER: Send address changes to TV Technology, P.O. Box 1214, Falls Church VA 22041. Copyright 2007 by IMAS Publishing (USA) Inc. All rights reserved. For reprints contact the author and TV Technology.

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FROM THE EDITOR

A Busy Holiday



It was a busy holiday season for those of us covering media technology. A flurry of FCC decisions, coupled with a mega-takeover of the nation's largest satellite broadcaster, left many speculating about the future of the business as we said goodbye to 2006 (and made a few reporters regret that they left the office early on Friday).

The fun began a week before Christmas when the FCC altered the rules to make it easier for telcos to obtain local video service franchises. This is long overdue. Despite Commissioner Martin's assertion that lack of competition has led to a 93 percent increase in cable rates over the past decade—which were spelled out in the commission's latest video com-

petition report—those figures don't really tell the whole picture. Verizon and AT&T are altering the local media landscape and while it's not yet a tsunami, the sheer size and effort behind their campaigns to launch TV services could begin to make a noticeable difference in 2007.

A week later, John Malone stepped back into the media headlines with his takeover of DirecTV from News Corp. This is the second time in several years that DirecTV has been sold, but something tells me the next couple years will not be anything like the satellite broadcaster's first decade. With Malone at the helm, anything's possible, but his vast knowledge of the cable industry and his reputation as an expert dealmaker is sure to keep his competitors off base.

Finally, to ring out the old year, the FCC issued its long-awaited approval of the AT&T-BellSouth merger, making the company, in effect, the largest potential provider of video in the U.S. While the launch of AT&T's "U-verse" IP-based television service has gotten off to a slow start, combining the AT&T/BellSouth/Cingular customer base will become a media juggernaut, and will enable the company to take the concept of the voice, video and data "triple play" to the next level.

All this took only three weeks, but it was a period that will impact our industry for months and years to come.

Tom Butts
Editor
tbutts@imaspub.com

LETTERS

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

Deliberate Deception?

Dear James O'Neal

Regarding your editorial in the Nov. 1 issue of TV Technology ("Train Wreck"), the difficulty that consumers face in buying both standard analog TVs also applies to DVRs that currently are also sold with analog tuners, is that retailers such as Best Buy and Circuit City and others are deliberately confusing the public.

As I understand it there are recourses for such behavior and I would not be surprised if some far-sighted attorney does not instigate a class-action lawsuit.

If a consumer has gone into a store lured by seemingly low prices, no one in the store is motivated enough to advise that person, that the analog TVs and recorders they buy are going to have a very short life.

While I agree the FCC should do something, the simple solution is to put pressure on on both the CEA and its members to do a little honest retailing.

The manufacturers are just as much to blame as it would not take much effort to place a sticker on the equipment pointing out the limited life if no converter box is installed after the mandated cut off date—if enforced—in February 2009.

We have enough experience with the surgeon general and cigarettes to witness that putting warning notices on cigarette packs does not seem to deter smokers to ignore the warnings. But making electronic retailers more responsible and honest in dealing with its customers would do more to stamp out the present deceptive practices. If you don't believe me go into any electronic store, especially the Wal-Marts and Targets where you will be served by limited knowledge personnel and see for yourself the response you get!

Ask yourself, if you were told that the product you were buying had a very short life, would you still buy? I think not!

Nigel Brent
Studio City, Calif.

Enough is Enough

Dear James O'Neal:

I read with great interest your recent editorial "Train Wreck," and agree with what you had to say. John Q Public is going to be upset, really upset, when reality sets in on or near Feb. 18, 2009. Their air waves, their ownership in those air waves, is being circumvented for the benefit of manufacturers and retailers. And I'm not so sure communications such as you suggested that were done on the war bonds, polio etc, would have or could have a positive effect on what is going to happen in 2009. The American people have been left out of the equation and most don't realize the true meaning of adopting digital broadcasting as now proposed.

In my opinion, "train wreck" is an understatement and we who are mere mortals in this equation may just say enough is enough. The TV we view presently is quality broadcasting/reception. We don't need HDTV, particularly its tremendous cost. I don't have actual numbers at hand but suffice it to say several million viewers are going to be screaming when they find out the TVs they purchase today will not work in two years. And instead of shelling out \$300 for a new one they will be asked to donate \$1,500 in order to view what they are viewing now.

Phil Taylor
Victor, Mont.

Not a Problem

Dear James O'Neal

The train may be a comin' but I'm not on the track. Neither is most of the television viewing public who are on cable and satellite. We already have our black boxes from those companies. February '09 can come and go and our TVs will work fine. But you know that.

Michael Pinhero
Charlotte, N.C.

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Another Format Battle Ahead?

Manufacturers debate pros and cons of HDV, AVC

by Geoff Poister

BOSTON

The Internet is buzzing with speculation that MPEG-2 is dying, and that HDV, the revolutionary low-cost high definition format built on MPEG-2 compression, is about to go the way of Hi8. But as with all video format stories, there are more sides to this one.

It's true that MPEG-2 is getting old. The main profile was defined in 1993 and since then, newer, more efficient codecs have been developed that deliver comparable quality at half the bit-rate.

MPEG-2 also relies on a method that is at the heart of the debate: Long GOP compression. This requires the algorithm to analyze long groups of frames, which slows down the process and makes frame-accurate editing more challenging.

Tore Nordahl, an industry analyst and former vice president of product development and engineering at Panasonic, has proposed that AVC (Advanced Video Codec, aka, MPEG-4 Part 10 H.264), will lead to more efficient low-cost HD cameras that will replace the HDV format.

In fact there are two flavors of AVC currently on the market. AVCHD is the Long GOP version, which has been jointly developed by Sony and Panasonic and is already present in some of their consumer level HD cameras. And AVC-Intra is the intra-frame version that Panasonic is introducing in its new high-end P2 camera, the AJ-HPX2000.

"You can get HDV quality in Long GOP at 12 Mbps instead of 25 Mbps with the AVCHD codec," Nordahl said. "Intra-frame will require 40 Mbps to achieve HDV quality, so you have to pay a bit-rate penalty to get intra-frame."

So what does this mean for the future of HDV level cameras—those that offer HD acquisition in sub-\$10,000 range?

"The question is when AVCHD will migrate up to the professional low end," Nordahl said. "I expect some announcements in 2007."

Another issue of controversy is whether tape is on its way out.

"Tape is going away and that's another indication that HDV will be replaced over the next few years by non-tape formats," Nordahl said. "50 Mbps or more is no problem for memory cards. I think the market will move away from HDV."

This is where Panasonic is pressuring the market. The company chose not to join the HDV consortium, and instead forged ahead with its P2 memory card cameras. This frees them from the 25 Mbps MiniDV tape restraint, enabling low-cost HD acquisition using

DVCPROHD compression, and now AVCHD and AVC-Intra.

While breaking away from tape, Panasonic is also pushing the AVC codec away from Long GOP in its higher end cameras.

"For more professional production applications, Panasonic has decided to offer an intraframe AVC-I codec that offers the greater efficiency of AVC versus MPEG-2," said Bob Harris, vice president of marketing for Panasonic Broadcast & Television Systems Company. "By utilizing intra-frame compression and maintaining the data of each individual frame, AVC-Intra han-

consumer camcorders, does not fully use all the techniques defined by the AVC Long GOP algorithm, hence only producing picture quality good enough for consumer applications at the modest bit-rates they employ. And, he claims that AVC-Intra cannot handle the high compression ratios needed to fit a compressed HD stream to the low data rates and quality levels required by numerous broadcast production applications. The Long GOP compression, although mathematically more complex, can achieve a better picture more efficiently than intra-frame compression, he said.

So Long GOP compression, accord-



The new Panasonic AJ-HPX2000 (L) uses AVC Intra, based on the MPEG-4, Part 10 codec, while Sony's latest HDV camcorder, the HVR-V1U, uses MPEG-2 Long GOP.

dles motion much more consistently, without the temporary change in sharpness and color as result of Long-GOP."

What strategy they will take with their future cameras in the HDV price range remains to be seen.

The future of HDV will depend on what the major camera manufacturers make available in the current HDV price range. The HDV consortium is made up of Sony, Canon, JVC, and Sharp, and Canon and Sharp have joined the AVCHD committee as well. At the moment, they're not showing their hands, but there are hints in the air.

Mitch Glick, assistant manager of product marketing for the Consumer Imaging Group at Canon was mum about the company current product strategies, "however, we always move in the direction of technology. If there is a more effective technology which offers clear benefits to the consumer, we would embrace it down the road," he said.

NOT SO FAST...

Now the other side of the story. According to Hugo Gaggioni, chief technology officer for the Broadcast and Professional Group at Sony, there is nothing wrong with MPEG-2.

"If you are talking about efficiency, MPEG-2 Long GOP is superior to AVC-Intra," Gaggioni said. "Long GOP can achieve better picture quality at lower data rates as compared to the use of Intra-frame only techniques."

Gaggioni says that the AVC Long GOP HD chip, currently in use in Sony's

ing to Gaggioni, is not the enemy. In fact, Sony is working towards a high-quality AVCHD single chip based on Long GOP to one day supersede MPEG-2 in some of its professional cameras.

"We're still developing it," Gaggioni said in regard to an AVC Long GOP HD single device suitable for professional HD acquisition.

But in the meantime, Sony is proud of the results they are attaining with MPEG-2, both in the professional HDV and XDCAM lines.

Gaggioni also challenges the notion that tape is inferior to solid state or optical media.

"If tape excels at something, it is that it can handle higher data rates than solid state or optical storage can," he said. "For example, our HDCAM-SR tape can handle easily over a 1000 Mbps; something that it is impossible to achieve in a cost-efficient manner by any other storage media."

But for lower data rates such as those offered by HDV and AVCHD, alternative storage media may become more convenient.

HDV has some other advantages, such as an established MPEG-2 infrastructure widely supported by current NLEs.

"Encoding and decoding of the MPEG-2 compressed streams can be achieved in real-time or even faster than real-time by software-only computing platforms, as opposed to having to use a dedicated hardware device to accelerate these functions, as is the case with AVC and JPEG 2000," Gaggioni said.

"Because of the wide number of users and manufacturers involved in HDV platforms, I can't foresee HDV going away anytime soon," said Craig Yanagi, national marketing manager, Creation Products at JVC. "Especially from the standpoint of working and editing the material. MPEG-4 [AVC] requires eight times the processing power for encoding and three times for decoding."

Companies are also finding ways to get around what some consider the Long GOP disadvantage of HDV. JVC and Canon offer HDV cameras with an HD-SDI output, allowing one to record uncompressed true HD to a portable hard drive. A Miranda converter translates HDV material to HD-SDI for more efficient editing and compositing.

According to Yanagi, JVC will concentrate on developing its HDV 720p platform for the foreseeable future, with one eye on emerging technologies.

"JVC has taken AVC into consideration," Yanagi noted. "This is evident in the announcement of our prototype handheld HD camcorder that uses the AVCHD codec."

PEACEFUL CO-EXISTENCE

So, are MPEG-2 and HDV dead?

"That is a very naïve claim at this moment," Gaggioni said. "HDV will continue. It's all built around MPEG-2, and that will not change in the near future. Some newer compression techniques are creating havoc within a complete workflow because they are not supported all the way around."

"When the time comes when the level of silicon manufacturing has matured enough for a full utilization of AVC Long GOP for HD, you bet we'll use it," Gaggioni said. "But our main objective is to produce well-rounded products from a system perspective; products that work from production through post production."

Even those predicting the demise of MPEG-2 have softened their edge.

"I have praised HDV in the past," Nordahl said. But, he emphasized, technology marches on.

"At this time the handwriting is on the wall," Nordahl said. "There are new compression systems available from leading manufacturers that are twice as efficient as MPEG-2. As new products come on market, sales of older MPEG-2 products will drop off."

If you listen to all of the voices, one can conclude that MPEG-2 is not dead. HDV is not dead. In fact, they are surprisingly viable and there is nothing immediately poised to kill them. But as with all formats in a technologically advancing world, they will die in due course of natural causes. And their reincarnation is now in development. ■

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DirecTV

CONTINUED FROM PAGE 1

sports networks and \$550 million cash. The deal gave Murdoch stronger control over News Corp.

Few expect that Malone, ever the dealmaker, to run DirecTV as a stand-alone enterprise. The most sardonic view postulates that Liberty might sell the DBS firm to the "new AT&T," which has had a reseller role with DirecTV for several years and could use satellite distribution to bolster its video agenda. Malone sold his previous multichannel operation, Tele-Communications Inc., (TCI), at the time the nation's largest cable TV firm, to the "old AT&T" in 1998.

A somewhat more likely scenario envisions that Malone will push for an alliance with DirecTV's arch rival: EchoStar's Dish service. DirecTV has long been the larger provider (now with 15.6 million subscribers), but Dish has grown steadily to 13 million customers. Cable's aggressive "triple play" campaign offering voice phone service in addition to digital video and data/Internet is starting to retrieve customers who migrated to DBS service during the past decade.

Without sufficient phone or Internet access capabilities to compete with cable, DBS's boom days may be gone—further supporting a consolidation of DirecTV and EchoStar. While it is always hard to handicap such an alliance, the next few years may be a fertile time for such a

merger, given the favorable antitrust climate in Washington for such mega-deals. A quick flip of DirecTV would fit Malone's style, if he can find the right tax terms.

To approve a DirecTV/EchoStar merger, regulators would seek a strong commitment to investing in a nationwide broadband network, according to some analysts.

enhanced DVR technology.

Starz is a centerpiece of Liberty's vast content portfolio, which is critical to the DirecTV operation. Liberty also holds stakes in QVC, Discovery Networks and many other program channels. In November, Starz launched "Overture Films," an ersatz studio that will produce and distribute up to 12 feature

bundled with DirecTV's video delivery to offer an alternative package competing with conventional cable service.

Yet another local distribution possibility comes via a company in which Liberty Capital, another Malone-controlled offshoot, holds a stake. Current Communications Group LLC, a Germantown, Md., firm, is designing broadband over powerline systems—another alternative for local distribution of satellite channels.

As Malone and his Liberty crew develop their DirecTV plans, fundamental changes are inevitable—such as the fate of Chase Carey, who has headed DirecTV since News Corp. acquired it. After nearly 15 years in Murdoch's fold, Carey faces culture shock within Liberty's management. Malone's selections for managing DirecTV may offer strong indications about where he expects to move the company.

Since regulatory and financial approvals of the Liberty-News swap will not be completed until mid-year, Malone and his team have about six months to pull together the first steps for running their new DBS property. ■

Gary Arlen of Arlen Communications Inc. has analyzed the cable, satellite and digital content businesses for more than 20 years.

Since regulatory and financial approvals of the Liberty-News swap will not be completed until mid-year, Malone and his team have about six months to pull together the first steps for running their new DBS property.

RECORDING & PROGRAMMING

Malone—long an advocate of on-demand viewing—will undoubtedly overhaul DirecTV's content agenda. Popular features such as the digital video recording function may change. TiVo got its biggest initial push from DirecTV, only to be supplanted by the DVR technology of NDS, a company owned by News Corp., when Murdoch acquired DirecTV. Now TiVo may find its way back into the set-top roster. But just as likely, Malone may look elsewhere to the growing number of suppliers of

films per year—further feeding the content pipeline.

High-definition TV plans are less clear, although the growing audience of HD-owning households may demand that DBS as well as cable companies expand their high-def lineups.

ALTERNATIVE DISTRIBUTION

One competitive approach for DirecTV is an alliance with the emerging local wireless broadband services. These systems are being developed for Internet access, but conceivably could be

Frank Stanton Dies at Age 98

Former CBS president pioneered the business of television

by James O'Neal

NEW YORK

Dr. Frank Stanton, broadcasting industry icon and longtime president of CBS television died at his home in Boston on Dec. 24. He was 98.

Stanton was fascinated by radio early in his life and while pursuing his Ph.D. in psychology at Ohio State University, developed a device that could be installed in a radio receiver and provide information on the listener's program choices. CBS president, Paul Kesten, was impressed upon learning of the device and offered Stanton a job in the CBS research department in 1935.

Stanton succeeded Kesten as president in 1946 and held that post until his retirement in 1973. He served on the CBS board of directors until 1978 and continued as a consultant to the organization until 1987.

Stanton was responsible for much

innovation within the CBS organization, including the push from radio into television, the CBS "eye" logo



Dr. Frank Stanton (kneeling) appears with William S. Paley, CBS Network founder and a CBS field-sequential color camera in this 1951 photograph.

and the construction of the Black Rock Manhattan headquarters building.

He was a promoter of Dr. Peter

Goldmark, the network's first chief television engineer, and frequently served as the go-between in situations involving Goldmark and the network's founder, William Paley. Best known of these was Goldmark's development of a color television system predating NTSC color.

FCC approval of the system was initially viewed as an impressive victory over RCA and its competing color system. However, as the CBS system was not backwardly compatible with the millions of black and white receivers in use, network viewership declined sharply whenever color was transmitted. This ultimately led to the development of NTSC color.

Stanton is possibly best remembered for his battles involving First Amendment issues and for his support of CBS journalists. In 1971, he was threatened with imprisonment in connection with a special investigative report, "The Selling of the Pentagon."

The program was critical of a \$30 million expenditure of taxpayer dollars on a DOD image-improvement campaign. Stanton rejected demands from the House Interstate and Foreign Commerce Committee for program outtakes, saying that the order amounted to an infringement of freedom of the press. The committee cited Stanton for contempt, but House members later rejected this action.

Following the assassination of President Kennedy in 1963, Stanton kept CBS News on the air for four straight days and ordered that no commercials be run during the news coverage.

Stanton's wife of 60 years, the former Ruth Stephenson, died in 1991. He left no immediate survivors. ■

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Colorado Blizzards Push Stations' Limits

Broadcasters attempt to keep crews rolling

by Ken Freed

DENVER

Denver television stations were stretched to the limits of their capacity with back-to-back blizzards at the end of December 2006. The metro area faced up to three feet of snow in the first storm, Dec. 20-22, then received another foot of snow a week later.

The first storm closed Denver International Airport for two days and closed highways in and out of the city. Major traffic arteries were clogged as residential streets became impassible. The second storm was lighter and shorter, yet snow drifts on the open plains southeast of the city reached as high as seven feet.

Denver area TV stations knew the storm was coming. Most stations in the city use the Weather Central system with four live radar sweeps across the state in real time. The system lets weathercasters zoom in on local conditions and shows the storm track with 24-hour modeling. If Weather Central satellite feeds are interrupted, Vyvx fiber serve as backup.

CAN'T GET THERE FROM HERE

Knowing what was ahead, however, was not the same as dealing with the reality.

"The storms hit right in the middle of vacation season," said Byron Grandy, news director for ABC affiliate KMGH-TV7. "We're usually down to minimum staff during the last couple of weeks of December. There were not a lot of anchors, reporters and producers around. To make it worse, the storm meant that people could not come back to help. I was stuck in Dallas, trying to get back. You can imagine that I was on my cell phone a lot."

According to Carl Bilek, news director for Tribune station KWGN-TV2, getting those staffers who were still in town to the station was a major logistical effort.

"Everyone was running late. Those with four-wheel drive were shuttling those with only front-wheel or rear-wheel drive. With the side streets closed,

sometimes our people had to hike through the deep snow to a main street where they could get picked up."

"Our biggest challenge was logistical," said Don Perez, chief engineer at NBC affiliate KUSA-TV9. "We had to deal with getting people to work from all over the city and then housing and feeding those who could not get home. I became a detective trying to find hotel rooms and finding ways to get food brought in, especially with most of the restaurants and grocery stores closed."

Grandy said KMGH did its best "to get all hands on deck." He housed people in hotels near the station in central Denver, where most of the TV stations are located within a six-block area.

When employees finally reached

the station, the next biggest challenge was getting the crews to the stories, according to Bilek.

"A lot of roads were closed," he said. "So we had live crews stuck in the same traffic and fighting the same blizzard conditions as everyone else. We heard about a major car crash across town, for example, and it took our crew almost three hours to get there. The emergency vehicles had a hard time getting there, too. This is why we sent a crew out to DIA in advance of the storm, so they were already on hand when the airport closed, and we'd reserved rooms for them at a hotel near the airport."

Perez said his team faced a more complex challenge than other Denver stations because KUSA has more distribution channels. Along with Channel 9, the Gannett station now owns KTVD-TV20, formerly a UPN affiliate, and between the two signals, KUSA offered 18 hours of continuous live coverage.

"Sometimes the two stations simulcasted and sometimes not," Perez said. "We stream both stations on the Web with text production, plus we are the only station in Denver now multicasting separately in HD. As a result, from a purely technical perspective, we have challenges most stations in the market do not have."

In the field, the dense snowstorm presented still more difficulties.

"We had trouble getting a clear microwave signal from the remote



9NEWS Meteorologist Kathy Sabine tosses back to anchors Adele Arakawa and Bob Kendrick.

BLIZZARD, PAGE 12

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PBS Confab Now a Tradition

'Tech.Con.07' celebrates 30th anniversary

by John Merli

LAS VEGAS

One of the most successful events to have sprung up around the NAB industry reunion in Las Vegas each spring is an engineering confab that is about to reach its own

milestone. The PBS Technology Conference (Tech.Con.07) is on the verge of turning 30 years old, spanning three of the most revolutionary decades in broadcast history.

When an estimated 700-plus public broadcast engineers, keynote speakers and exhibitors converge

on the ultramodern conference facilities of the MGM Grand (the tech conference home since 2004) on April 11-14, they'll tackle an ambitious four-day agenda that traditionally leads up to the NAB convention.

CUTTING EDGE

The PBS Technology Conference has always aspired to present cutting-edge, relevant information on current and emerging technologies to the professionals who represent the technical backbone of the Public Broadcasting Service—the local public stations. In the past decade, the rate of change has accelerated as engineering staffs have had to deal with increasingly complex equipment and systems for the transition to DTV, the rise of Internet broadband, and myriad other video content platforms.

What began in the mid-1970s as a small informal gathering of the PBS Engineering Committee in a former Las Vegas school building that had

been converted into the studios of pubcaster KLVX-TV, has now grown into what PBS now calls "the most important professional development conference for technology profession-



TECH.CON.07
PBS TECHNOLOGY CONFERENCE

als in public television." Few PTV engineers would disagree.

This year, in addition to informative general sessions and targeted presentations, the first and last days of the four-day conference will be devoted to comprehensive tutorials that already have a proven track record of success: Gary Sgrignoli's all-day seminar on 8-VSB technology on Wednesday (and open to those outside public TV, as well). PBS sessions for traffic managers will also be held on Wednesday afternoon. The ENNES/SBE Workshop on "Everything Audio" is slated for Saturday. (NAB exhibits at the LVCC open on Monday.)

"We get a lot of requests for in-depth tutorials at the conference and we always have to weigh what to include and how to keep people up-to-date with new and existing technology," said Lew Zager, director of the DTV Strategic Services Group at PBS.

PBS, PAGE 18

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Blizzard

CONTINUED FROM PAGE 10

units in some places," said Perez. "Extending the mast was not always enough. Sometimes we had to move the truck to another location to get the shot in."

Atmospheric interference is common in major snowstorms, according to Bilek.

"You have to roll with the punches. This is why we have dual paths open to us. If we cannot get a live shot of road conditions, for whatever reason, we can access the Colorado Highway Department's network of 140 live cameras around the state. We've learned to fly by the seat of the pants, improvising as we go, to work around any obstacle."

"We expected equipment failures," Grandy said. "The first storm featured extreme cold, with our reporters and photographers standing out in wind-chill down to 30 degrees below zero. The second storm featured extreme wet, which actually meant more failures, and the only thing we could do was bring the cameras back to the station and let them dry out. All this

caused incredible frustrations."

Each of the stations contacted mentioned severe cold freezing the masts on the remote trucks.

"Sometimes we could just withdraw the mast, let it warm up, and try again a few minutes later," said Dave Martinez, engineering maintenance supervisor for KWGN, "but the mast on one of our trucks froze so completely that we had to bring the truck back and park it in the garage overnight, so the mast could thaw."

Martinez himself faced a more daunting task. "We have 22 dishes outside in our farm, and I worked 39 hours straight through the first storm keeping all the dishes clear of snow. The majority of our technical operations team worked extra hours, too, some of them doing triple shifts. We all were juggling shifts to keep the operations running."

"Storms like these are not routine," Grandy said, "but this extra effort does come naturally for newsrooms. Some things could have run smoother, but our people are professionals who knew what to do. They just went out and got it done." ■



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Rebecca Campbell

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Addressing the Continuum

Video takes on new forms at the annual HPA Tech Retreat

by Robin Berger

RANCHO MIRAGE, CALIF.

Host Mark Schubin plans to cover all bases at this year's HPA Technology Retreat, scheduled for Jan. 31 through Feb. 2 here at The Westin Mission Hills Resort & Spa.

"There isn't one video anymore," Schubin said. "Video has become a huge continuum from things that appear on a cell phone, to things that appear on a movie screen. So, we're addressing that continuum this year."

Among the hot topics are extended color gamut (aka wide-gamut color), digital audio, MXF interoperability issues, and morphing software.

EXTENDED COLOR GAMUT

The old NTSC color phosphors restricted TV's onscreen colors to an RGB triangle, which excluded possibilities like the saturated turquoise of a packet of Salem cigarettes, Schubin said. But now, he noted, "There's a standard

that's just come out for consumer gear."

This consumer electronics standard—HDMI (high-definition multimedia interface) 1.3—adopts the

defined by Kodak. According to widely circulated reports, the new standard can support 1.8 times as many colors as existing HDTV signals.

In a press release from last June, manufacturers claimed that HDMI 1.3 "will enable the next generation of HDTVs, PCs and DVD players to transmit and display content in billions of colors with unprecedented vividness and accuracy."

Sony demonstrated the first xvYCC-compliant high-resolution signal processing system at CES2006 on an 82-

inch Bravia LCD flat-panel TV.

Schubin plans to have Sony's Dr. Naoya Katoh, one of the people who worked directly on that standard, at the retreat, as well as Jeroen Stessen from Philips Laboratories. They will team up to present "Extended Color Gamut for Consumers" at 4 p.m. on Wednesday, Jan. 31.

The discrepancy between xvYCC and the standards available for production equipment might mean that people at home could see something quite different from what the creator intended, Schubin said.

Grass Valley's Dave Bancroft is slated to host a 7:30 a.m. breakfast roundtable called "Will We Still Get WYSIWIG with New Display Technologies?" on Friday, Feb. 2.

And well-known technologist Charles Poynton will address the overall impact of xvYCC on broadcasters at a half-day seminar starting at 2 p.m. on Jan. 30 at the same venue, for an additional \$225.

Described by Poynton as "the only current standard applicable to the video community," the seminar will show how the graphics arts and movie industries addressed a similar problem, using graphs, diagrams and equations. Then, after answering questions on how xvYCC works, he plans to open the floor to discuss business strategy and philosophical issues, including the likelihood of the studios signing off on xvYCC and, if they did, how the standard would be deployed.

DIGITAL AUDIO & MXF

"People have a hard enough time monitoring stereo," Schubin said. "How the heck are they going to deal with six channels in a live production?"

To discuss the trials, tribulations and (hopefully) solutions to creating 5.1 are

two breakfast roundtables—one for multichannel audio on Thursday, the other for audio post on Friday—presented by Sensurround colleagues Richard Cabot and Tony Dal Molin.

On Friday, Feb. 2 at 11:35 a.m., Discovery Networks' Josh Derby will present his own take on digital sound: "Measuring & Standardizing Loudness."

On the MXF standard, Schubin said that when it was introduced several years ago, "manufacturers said 'all hail MXF, this takes care of everything.'"

Clyde Smith, head of engineering at Turner Broadcasting—described by Schubin as "a guy from the trenches"—doesn't quite see it that way. He will talk about his firsthand experience with "MXF Interoperability Issues," at 2 p.m., Friday.

MORPHING SOFTWARE

Schubin isn't easily impressed, but was completely wowed at IBC2006 by FrameFree Technologies pixel-matching software. The company is a joint venture between a U.K.-based IT holding and investment firm called FrameFree Holdings Ltd. and Japan's Monolith Co., a high-tech venture specializing in IP technology.

The company is taking its morphing software in three directions. For starters, Schubin said it's creating moving image sequences from a handful of still photographs—"an extraordinary tool for production."

FrameFree also retooled distribution by compressing the data needed to transmit. According to Schubin, "they only need to send key frames and instructions rather than video."

Lastly, the company has proposed a new compression standard to SMPTE.

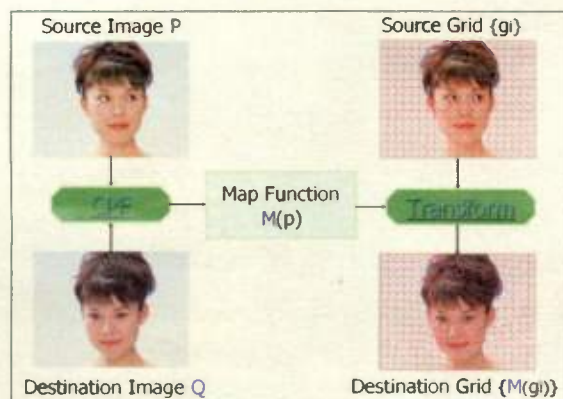
"This is absolutely the first look that anyone's going to have of it in the United States," Schubin said. "They did discuss it very briefly at IBC—but I don't think anyone was listening."

FrameFree's chief scientist, Igor Borovikov, will introduce the company's technology at the Retreat on Wednesday, Jan. 31 at 5:15 p.m.

He'll start with a description of the Critical Points Filter—the patented technique the company uses to match images. The CPF automatically calculates a morphing map between any two images by performing pixel-level matching between them.

"We believe that the natural and efficient image morphing offered by CPF can indeed 'liberate' video from frames and pixels, and thus revolutionize the way video is produced and distributed in a matter of just a few years," Borovikov said.

For more information on the event, visit www.hpaonline.com/mc/page.do. ■



Europe's FrameFree Technologies will be on hand to show its picture morphing technology.

International Electrotechnical Commission's 61966-2-4 standard for color, commonly called xvYCC, short for "Extended YCC Colorimetry for Video Applications;" YCC is a device-independent color range originally



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"Sony was the only supplier to step up to the plate."

— Jason Taubman and Paul Bonar, Game Creek Video

HDemanding

Jason Taubman, VP of design for mobile production company Game Creek Video, faced contradictory demands. He tells us, "Some clients required the highest quality in 1080i and others demanded the same in 720p. Some venues only had fiber and some strictly triax. Sony was the only supplier to meet all these requirements in a single camera."

"We committed to the HDC-1500, Sony's 1080/60p camera before it was even a model number," says Paul Bonar, VP of engineering. "And Sony committed to us. Their engineers heard our input on the large lens 'sled,' which works like a charm. We gave them distressed cable to help design the triax adaptor, which is brilliant. And in service and support, Sony has risen to every challenge and met every need. We're now on our fifth consecutive truck with the HDC-1500, the best HD camera we've ever seen."

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Super Bowl

CONTINUED FROM PAGE 1

cameras and an upgraded suspension system from Cablecam, a Los Angeles-based developer of rigging systems. The network was considering a robotic camera and more special effects at press time.

HIGH SPEED

CBS officially kicked off its "Super-Vision" high-speed camera footage on Jan. 7 during the playoff game between the New England Patriots and the New York Jets. The network first began working the high-speed option into its broadcasts on Thanksgiving, during the Miami Dolphins and Detroit Lions game at Ford Field, according to Aagaard. Two models will be used at the Super Bowl: the Phantom V10, manufactured by Vision Research and supplied by

Image Cam and Inertia Unlimited, and NAC Image Technology's Memrecam Hi-Motion, supplied by Fletcher Chicago Inc.

Once known only for their ability to capture the particulars of car crashes, CBS proved that high-speed cameras could provide notable looks at a golf swing or at a club head hitting a ball off a tee.

But, unlike golf, football doesn't allow for 20- to 30-second playback—eight seconds is more like it.

So, optimal placement and judicious

usage are paramount. Aagaard said he envisioned two handheld Memrecams with 22x lenses in the field, and one Phantom V10 with a 100x lens sitting on a tripod in the CBS announcer booth high above the 50-yard line.

"They're obviously in a position to see the ball crossing a first down or goal line, or a fumble situation," he said. "You put a handheld on the near side and the far side (of the action) because you can be blocked, so you're trying to cover yourself both ways. And then you take the high camera and try to focus that on the quarterback if he's throwing, or maybe on a wide receiver."

Obviously the production crew will further finesse its strategy once they know the contenders.

Although the Phantom claims to shoot 500 frames per second compared to 300 fps for the Memrecam, Aagaard said the latter "matches better with our other cameras." Both are set to shoot at 300 fps, where, he said, "they both look

cam, Sony (to its HDCF950 camera) and gimbal manufacturer Cineflex.

During the regular season, improvements translated into more aggressive coverage for Fox, NBC and the NFL Network.

"On kickoffs, we can park up in the corner and chase the runners down the sidelines," said Rodnunsky, who also noted the system's ability to "fly over the line of scrimmage and behind the quarterback in a faster way."

SHOT, SPECIAL EFFECTS & TIMING

CBS will install a robotic camera supplied by Imagecam in the TV tower used by its local affiliate, WFOR. The camera will provide the requisite establishing shots, shooting back at the stadium via fiber.

"We cannot have a blimp after 4:30 over the stadium—it's considered a Level One security situation," since 9/11, Aagaard said.



CBS will use the NAC Memrecam Hi-Motion camera to provide high-speed HD coverage of Super Bowl action.



ESPN used a Memrecam Hi-Motion camera from NAC Image Technology during the Sept. 25 Monday Night Football broadcast at the Super Dome in New Orleans. The camera on the right is a Thomson LDK6200.

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pretty good."

Lighting is also a consideration. "Whenever you do anything 300 frames per second or up you're always going to have an issue with light," he said.

The Memrecams require a light level of about 190 foot-candles. Dolphin Stadium agreed to provide 175, Aagaard said. It is generally recognized that light levels in the corners are less than that. So, Musco Lighting is providing a secondary source.

"The camera is selectable if you have lower light levels—we can go from 300 [fps] down to 240 and gain an additional stop of light sensitivity," said Fletcher's Dan Grainge. "But, if you have to use it below 180, why use it?"

TRACKING SHOTS

Cablecam President Jim Rodnunsky said the suspension system that CBS contracted for the post season (beginning Jan. 7 at the AFC Wild Card game) operates 35 percent faster than it did a year ago, thanks to improvements by Cable-

He said CBS was also looking to do more virtual graphics.

"If the situation is right, we will use a graphic called the 'Tackle Box' which will virtually show whether the QB has stayed in the pocket or not."

To date, CBS broadcasts have included some virtual stadium signs for billboards, as well as drive charts and target lines "where guys need to get to when they kick," Aagaard said.

The parameters of this work in progress will probably not be determined until completion of the AFC Championship on Jan. 21.

Aagaard is impressed with the amount of cool stuff out there to cover the big game. But, he observed, there are also obvious limitations.

"You still have to find time to get some of these elements in properly [without] missing any snaps," he said, noting the need to balance technology requirements against, for example, the pace of quarterbacks who favor no huddle offense. "Half of our equipment is useless if Peyton Manning gets to the Super Bowl." ■

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PBS

CONTINUED FROM PAGE 12

Zager, former vice president of technology at WETA-TV in Arlington, Va., is overseeing parts of this year's agenda, including the evaluation of technical papers.

"We discovered there was significant demand for solid tutorial presentations on that first Wednesday before our meeting really began, so that's why we have Gary's seminar set to go on the first day," he said.

Zager said 8-VSB continues to develop as a technology.

"It's not a simple or unchanging technology. ATSC standards continue to evolve and there will be new material presented. We will soon be approaching 10 years on-the-air with DTV for some of our stations. Station engineers who have not yet been schooled in the technology will benefit, and others will find Gary's introduction to some new developments advantageous," he said.

(The Wednesday seminar, technically a pre-conference event, has a \$50 registration fee to cover the cost of the 800-page tutorial book provided for each attendee; attendance earns one SBE credit toward recertification.)

Thursday and Friday, April 12-13, will be devoted mostly to general and



A session from Tech.Con.06

breakout sessions, as well as a joint PBS/NPR session on Friday morning.

(At deadline, keynote speakers and topics were still being arranged.) The traditional Friday night social event this year will feature an evening at the House of Blues at Mandalay Bay on the south end of The Strip.

END OF AN ERA

Ann Tucker, PBS director of cable and DBS strategy, said in recent years PBS's annual conference has closely reflected the management of the digital transition.

"Now we face the end of analog transmission in early 2009, along with the rise of all sorts of new consumer electronic devices operating in a cross-platform way," she said. "As systems become more complex and additional

business models emerge, we're working to take technology more to the forefront by using digital as an effective strategic asset."

This year, the PBS meeting will complete the merger of IT sessions with broadcast engineering sessions.

Zager observed how the arrangement reflects an operational assimilation.

"With IT expertise and IT topics becoming an

integral part of the typical broadcast plant these days, the need for 'IT-only' discussions is no longer needed," Zager said. "But needless to say, several of our discussions will have IT components and IT issues certainly will be covered."

Another change that continues to evolve is the meeting's finale on Saturday. PBS merged its events on this last day with the Society of Broadcast Engineers in 2004, and added the ENNES Workshop (where Zager said attendance has tripled in recent years).

Tucker and Zager believe the meeting's current NAB headquarters at the MGM Grand (there have been several "homes" as it continued to grow) is ideal.

The hotel complex boasts an impressive conference facility with plenty of meeting rooms and ample space for

scores of exhibits, which Tucker said has evolved into a major attendee attraction unto itself. Not bad for something that got its modest start only several years ago when a lone exhibitor asked to set up his wares at no charge on a crowded table in the hallway outside the ballroom of a former home, the Alexis Park (one of the very few hotels in Nevada without gambling).

At deadline, many past exhibitors had already re-upped for this year's conference and nearly 20 sponsors—including Sony, Harris, Omneon and Avid—had signed on again for 2007.

Logistically, Tucker said the MGM Grand has its own designated stop on the route of the town's monorail system (most Strip hotels do not). The fully automated monorail also serves the LVCC a few miles away, the home of NAB2007. Also the MGM Grand, the largest hotel in North America, is within walking distance of many other major hotels and restaurants, she added.

True synergy between Tech.Con.07 and the older, larger NAB Broadcast Engineering Conference has also evolved over the years. And as if to underscore both organizations' cooperative efforts, PBS's Zager is this year's chairman of the NAB-BEC Committee which oversees the NAB tech conference.

More information about Tech.Con.07, including registration, can be found at www.pbsconference.org. ■

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The Quiet Revolution in the Newsroom

Economic, competitive pressures driving broadcasters to automate

by Claudia Kienzie

HAMILTON, N.J.

After years of waiting and watching from the sidelines, broadcast news organizations are finally taking the plunge and adopting newsroom automation solutions.

Rather than just stopping at the Newsroom Computer System (NRCS), which helps plan the newscast, they're springing for a complete, end-to-end, digital file-based, IT workflow. They want to be tapeless from acquisition to delivery, including ingest, media asset management, archive, editing, live production, and delivery to traditional and new media outlets.

The incentive behind this transformation is the mounting economic pressure to adopt a more efficient news production workflow. News organizations feel pressure to reduce labor costs to improve the bottom line. There's also growing competitive pressure to maintain a high production standard so that their newscasts will score high ratings.

ECONOMIC REALITIES

"In many broadcast news operations, labor is the highest cost associated with live production. This is driving news organizations to look for efficiencies—either by increasing revenues or by cutting costs," said Brad Rochon, OverDrive product manager for Ross Video Ltd, in Iroquois, Ontario, Canada. "Cutting costs often means being able to do live newscasts with fewer people in the control room, without compromising the quality of the on-air product."

"Today, major networks are laying off hundreds of production people, often in their news divisions. The adoption rate of automated newsroom systems by broadcast news operations has significantly increased this past

year, with more growth to come in the next three to five years," Rochon said. "So while the last few years have been about educating the market, we've now reached the tipping point, and we're starting to see a rapid adoption of our OverDrive technology."

The Over-Drive production control system enables automated control over third-party systems, such as video servers, DDRs, audio mixers, robotic cameras, routers, still stores, and other types of production gear. But it also offers a MOS interface featuring an ActiveX plug-in that integrates directly into NRCS, such as Avid's iNEWS and AP's ENPS. This interface promotes error-free fulfillment of the rundown established in the NRCS.

ABC News Washington has just completed the construction of its new

operation in New York, but it also occasionally goes live with breaking news or coverage of events taking place in Washington.

"Many large market facilities may have only a skeleton crew in the mid-



WBTV Director Of Operations/Engineering Don Shaw uses Crispin NewsCat to preview low-resolution news clips before restoring footage from archive.

dle of the night, but if there is a breaking news story, with OverDrive, they can go live with just one talent and one operator controlling the show. They don't need someone to man the CG, the audio, or video servers,"

"Resistance to change at the newsroom and control room level is the biggest challenge for any news automation system today."

—Scott Blair, Avid

Rochon said.

STAYING FLEXIBLE

Since OmniBus introduced its iTX station automation solution at the 2006 NAB, they've sold over 200 channels worldwide. At NAB2007,

OmniBus will unveil a new version of iTX customized to meet the needs of broadcast journalists. The new iTX for news product will leverage OmniBus' expertise in station automation, as well as its over 15 years experience automating newsrooms.

Rather than basing the news production workflow on specialized, expensive broadcast devices, such as video production switchers and video servers, iTX for news will employ IT technology to streamline the process with a drag and drop interface for ingest, desktop media browsing, timeline-based editing, graphics and audio effects, asset management, real-time video file conversion, and logo insertion for branding.

"Newsroom automation requires a very dynamic approach that's flexible enough to handle breaking news," said Ian Fletcher, chief technology officer for OmniBus Systems. "Journalists and producers need to be able to quickly re-order headline stories, and override the system to make from small to drastic, last minute changes to the rundown."

While the product does not yet have an official name, Fletcher said iTX for news will employ next-generation MOS integration. A decade ago, OmniBus worked closely with The Associated Press to develop the MOS protocol that enables automated integration of third party newsroom computer systems, such as the two market leaders, Avid iNEWS and AP's ENPS, as well as broadcast devices, and station automation systems.

"The nature of news itself is very dynamic today with 'user generated content' coming in from mobile phones, digital cameras, and other consumer devices," Fletcher said. "There's also video captured with the station's professional cameras, as well

NEWSROOM, PAGE 20

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Newsroom

CONTINUED FROM PAGE 19

as incoming video feeds. Our software-based approach is more agile and capable of converting all types of media for delivery via SDTV and HDTV or new broadcast platforms, like the Internet."

TAPELESS TREND

Michael Kroll, marketing communications manager for Crispin Corp. in Raleigh, N.C. agreed that there is a growing desire for stations, large or small, to have a completely tapeless newsroom. But this trend is not without some challenges.

"In a tapeless world, it's imperative to have a fully integrated management system in place. Without one, video could be lost forever through accidental deletion or incorrect filing," Kroll said. "For a news department, we had to look at this process as saving news stories in a digital form, not just saving files. News departments are very dynamic in their workflows and not always disciplined in file naming conventions."

For this reason, Crispin developed NewsCat, an integrated cataloguing and archiving solution designed specifically for the newsroom workflow. NewsCat archives news stories and makes them easily searchable through a browser-enabled system. NewsCat is used by three Lincoln Financial Group stations: WBTV-DT/TV, CBS3 in Charlotte, N.C.; WWBT-TV NBC12 in Richmond, Va.; and WCSC CBS5 in Charleston, S.C.

"Broadcast news operations have extensively adopted nonlinear editing and server-based play-out. But the real movement we've seen recently lies with stations adopting a more com-

plete, end-to-end tapeless workflow," Kroll said.

Crispin also offers a NewsWheel solution that allows broadcasters with an existing news department to add a 24-hour news channel with little investment. Crispin automation also includes NewsPlayX, which provides news element playback control for live news operations, using a MOS interface to the Avid iNEWS and AP ENPS NRCS.

According to Bill Burke, ENPS product manager for Associated Press Broadcast Technology in Washington, D.C., "Being able to easily leverage output for multiple targets—DTV, mobile TV, the Web—is a big part of the reason why people are investing in ENPS. ENPS is an NRCS that gives news producers familiar tools with which they can repurpose output and still have time to address editorial and quality issues."

"The biggest challenge in broadcast news operations today is to figure out ways to increase production without sacrificing quality. One way to do that is to employ technical solutions that minimize the extra work, while allowing a high level of control for news output," Burke said. "ENPS provides a way to get content to multiple outlets, while preserving the ability for those secondary channels to be programmed flexibly enough to respond with breaking news."

HEADING FOR HD

The Harris Nexio Newsroom is an integrated production solution that interfaces today's NRCS with the Harris Nexio Fibre Channel-based server. The Nexio Newsroom enhances newsroom productivity by offering simultaneous access to media in shared storage and supports a wide range of ingest formats. The companion product, Nexio NewsFlash, allows users to edit footage the moment ingest begins. And, finished clips can be played out to air as the media is committed to disk.

According to Fred Schultz, senior marketing manager of news solutions for Harris Broadcast Communications Division, the biggest challenge for broadcasters in the near term will be accommodating the increase in HD viewership in their market, while looking for ways to retain their existing brand loyalty at the lowest cost and dis-

ruption to their existing workflow.

"Nexio servers address this desire by providing complete format flexibility. Our integrated software codecs simplify workflow issues by letting users freely ingest, edit, and air all content that enters the newsroom," said Schultz. (Harris has implemented Best Master Architecture within the Nexio HD/SD servers allowing customers to begin editing footage using the best master available for each shot whether it's SD or HD.)

"Nexio's automatic up- and down-conversion and aspect ratio conversion provides the easiest transition and cleanest possible workflow for a station to transition from today's 'mixed markets' to full HD," Schulz said.

As with many other automation companies, RushWorks Media, a Carrollton, Texas-based company, started out with an automation platform that it adapted to the more rigorous demands of the newsroom.

"RushWorks initially set out to provide a very robust, cost-effective station automation solution called 'MasterPlay,' and then broadened from there to include the newsroom automation front-end, NewsRush," said Rush Beesley, president of RushWorks. "MasterPlay can scale from the smallest station, such as a low power TV station with a limited budget, up to a very large DTV broadcasting operation doing multicasting or centralcasting."

Simplification is an important element to news automation, Beesley says.

"NewsRush was a natural extension of our MasterPlay automation engine," he says. "Our intention was to make automating live news so simple and intuitive that virtually anybody could just sit down and create a news program without the help of legions of journalists and a very large newsroom."

The underlying process to NewsRush is something Beesley calls "Script-o-motion." As users are writing their news scripts, they embed automation commands by selecting "news icons," which instruct and control aspects of the live newscast automatically—such as pan/tilt zoom and camera selection, camera shots, lower third supers and other graphics, among other production elements.

ADAPTING TO CHANGE

Avid has been promoting the tapeless newsroom environment since the early 1990s. In 2006, Avid greatly expanded its newsroom automation portfolio by acquiring Sundance Digital, a leading broadcast automation company. For ingest, Avid offers CaptureManager and Sundance's IntelliSat. For news editorial and editing, Avid offers the iNEWS NRCS and Newscutter editing system; as well as Avid Deko and Thunder

graphics. For play-out management, Avid offers ControlAir, Command, and NewsLink.

"Digital news integration and play-out management [news automation] is a double-edged sword in the newsroom," said Scott Blair, product manager, on-air product management for Avid. "On the one hand, it allows ease of repetitive tasks, such as graphics ordering and repurposing existing video, and provides the ability to use fewer people getting the show to air. But, in some instances, news automation can create changes to current and accepted workflow practices inside the newsroom."

"Resistance to change at the newsroom and control room level is the biggest challenge for any news automation system today," he said. "As automation vendors, our workflow design must keep pace with current newsroom practices while at the same time creating news workflows that are adaptable to the station's circumstances and needs."

CLOSE TO THE EDGE

Live news, especially in HDTV, gives stations a marketing edge. But, most newsrooms must perform under tighter budgets, leaner staffs, and tight lead times. To Grass Valley's way of thinking, newsroom automation should automate every aspect of the news operation; speed up the process; and eliminate inefficiency.

"Journalists want to work as close to the deadline as possible because it gives them the best chance to collect all the facts," said Jeff Rosica, senior vice president, marketing and technology for Grass Valley. "By eliminating workflow bottlenecks—like digitizing from tape in real time; editing onto tapes; and carrying tapes into the studio—journalists have gained a lot of time."

Rosica said that Grass Valley uses IT solutions in lieu of proprietary ones wherever possible. The Grass Valley Infinity digital media camcorder is a network device that uses industry standard REV PRO drives, CompactFlash, FireWire, and Ethernet. The Grass Valley Aurora NRCS uses MOS protocols—so information and metadata can follow throughout the process automatically. Metadata can also be loaded into the Infinity camcorder so it always follows the associated content, eliminating the possibility of errors.

For larger stations, Grass Valley offers the Aurora news production system, a suite of software modules for ingest, editing and playlist management. For smaller stations, the Grass Valley Ignite integrated production system offers all tools for news creation and broadcast in a single MOS-compliant system enabling the news broadcast to be controlled by a single operator. ■



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2 GHz Relocation: Progress in 2007

Most broadcasters have submitted some required paperwork but more needs to be done

by Michael Degitz

Vice President,
Global Development and Spectrum
Management, Sprint Nextel

RESTON, VA

This year will certainly be an important year—perhaps the most crucial year—in transitioning Broadcast Auxiliary Service (BAS) licensees to new channel assignments.

In 2006, Sprint Nextel and the broadcast community made significant progress together toward the FCC mandate to relocate BAS transmission facilities in the 1990-2110 MHz spectrum band. As of Jan. 3, 100 percent of



Michael Degitz

the eligible broadcasters were engaged in 2 GHz relocation activities. Ninety-seven percent have submitted equipment inventories, and 70 percent of the inventories have been verified. We now have approved equipment and labor packages for 25 percent of eligible licensees.

On the other hand, only 15 percent of the affected broadcast licensees have signed a frequency relocation agreement with Sprint Nextel. As we all know, the FRA, or contract, is the cornerstone of a successful 2 GHz transition, as it documents the cost of equipment and services required to relocate a station, and how costs will be reimbursed.

On the positive side, at least one station has signed an FRA in 53 of the 210 total markets, and these stations are submitting purchase orders and installing equipment. But at the current time, now more than 18 months into the relocation schedule, 836 licensees still haven't entered into FRAs. So all of

us—broadcasters, Sprint Nextel, manufacturers and installers—still have a lot of work left to do.

While the 2 GHz relocation project involves a great deal of work, BAS licensees are finding that the end result is well worth the effort. In October, Yuma, Ariz., was the first market to transition its BAS spectrum. The broadcaster in that market is now operating on new digital equipment and within the new channel assignment. The move has made live shots easier and has extended their options for transmitting locations. This exemplifies how the 2 GHz relocation is helping broadcasters enhance their own newsgathering capabilities.

Once a BAS licensee has a contract in place, an equally important phase of the project begins: equipment fulfillment and installation. Here are some important items you should keep in mind:

Once a contract is executed, broad-

casters must submit purchase orders for Sprint Nextel approval to begin the process of shipping new equipment. It's important to remember that purchase order submission is only for the direct-pay equipment that is captured on Schedule D of the FRA; other expenses should go through the reimbursement process, detailed below.

Important considerations to keep in mind:

- Each purchase order must have a unique P.O. number.
- The purchase order must reference the Nextel ID number that is assigned to the old equipment being replaced.
- Do not include sales tax or shipping. Sprint Nextel will pay the sales tax and shipping separately. (In some cases the direct-pay manufacturers will not assess sales or use tax and the broadcaster will self-assess the taxes owed and

PROGRESS, PAGE 29

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Small Market Station Covers the 'BAS'es

Moving into new allocation requires top-notch recordkeeping

by Frederick R. Vobbe

LIMA, OHIO

Our journey into the new world of BAS started when a representative from Sprint Nextel visited us in the spring of 2005.

Our goal was to be transitioned before winter of 2005, and this is our story to cover all the bases.

The first thing your staff should prepare for is lots and lots of paperwork, recordkeeping, and accounting of time. You need someone in your organization who is very organized and is preferably on the management team.

Recordkeeping and accounting are paramount, so someone with a financial background should be in charge of coordinating all the paperwork.

There are tax issues, accounting for assets, as well as tracking employee labor and expenses. Expect legal fees, and teleconferences with your station's lawyers. Your station will require a contract with Sprint Nextel, quotations from vendors, and written purchase orders for all transactions. No matter how small the purchase, you need to have documentation.

Make sure that each transmitter you are proposing to change has a valid FCC license. You should have current authorizations on file, but should you fail to locate a license you will need your legal counsel to obtain a copy. Sprint Nextel

will require copies of all valid licenses.

At the same time you're copying and sending Sprint Nextel your licenses, make additional copies of your licenses for your station's legal counsel. They will need to file with the FCC for new frequencies. This is typically a modification of the authorization specifying new frequencies, power, and emission.

GET A LAWYER OR TWO

After construction is complete, you'll need to notify your counsel that the change has been made and your analog microwave system is now out of service. Contracts are necessary throughout the whole process. This not only includes Sprint Nextel, but also your tower crew, and any installers who will work on the project.

The Sprint Nextel contract is pretty much a boilerplate document, but each facility should obtain counsel to review and make sure it's in the best interests of the station. Labor should be documented.

At WLIO, we required each employee on the project to submit their hours working on the project. Hours were then calculated as straight time and overtime. In the case of a salaried worker, we took the weekly salary and divided by 40 to come up with a figure. Round to the nearest minute, and the total would be all the minutes added together rounded to the nearest 15 minutes.

Before WLIO started the transition

project we carefully documented all the locations where we could do shots with our analog system. Logs included location, azimuth of receive antenna, power output of the truck, and if the receiver's preamplifier was on or not.



Frederick R. Vobbe is vice president and chief operator of Lima Communications Corp.

There was also a small area on the log for the operator to post notes, such as "a little sparkle in the reds," or "deep fades at times during 10 mph winds." This is important as it sets a benchmark for how well your new digital system is performing.

At the least, you should be able to do digital feeds from any location where you did a P3 or better analog transmission.

As you start the process, you're going to be asked for an inventory of all equipment. This includes receivers, transmitters, antenna, line, control wires, positioning units, mounts, etc.

Your complete inventory should include manufacturer, model, when the asset was purchased (you should have documentation), and approximate cost of the asset. Your new gear should be installed by your staff or a qualified contractor. (If you use a contractor, don't forget to include a cost for the labor in your documentation.)

In the case of tower crews, be sure that you select a crew that has sufficient insurance to cover losses of equipment, or even your tower should they have an accident. Although it costs money, have the insurance certificate reviewed by your legal counsel to make sure you and the station are protected.

When your equipment is installed, test it! In our case, the testing paid off as four hours after the antenna on the tower was installed, we had a major breaking news story that we could cover live! Had no tested been done, you could have only guessed to the success.

The testing should be done by your regular truck operators, and using the logs from your analog operation, test from each of the locations. You should also test from various locations where you had no success or P1-P3 quality

SMALL, PAGE 28



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Transition Affords Comparison Shopping

Despite Sprint Nextel restrictions, there are opportunities to compare features

by Craig Johnston

SEATTLE

Thanks to the great 2 GHz relocation gear swap, broadcasters are getting a chance to comparison shop for their new digital microwave equipment.

With Sprint Nextel paying the bill for the spectrum-efficient digital radios to allow broadcast ENG crews to free up precious bandwidth by working with narrower channels, television stations are getting a do-over on equipment and vendor decisions they made decades ago.

Back in the 1970s, most stations moved into live ENG in dribs and drabs, shopping for the best, or the least expensive. There wasn't much to choose from; of the six microwave radio vendors currently working with Sprint Nextel to replace the analog gear, only

one, Microwave Radio Communications existed back then, first as Microwave Associates, then as M/A COM.



The Nucomm ChannelMaster

WIRELESS DEMAND

Today, with vendor prices flattened to meet Sprint Nextel's negotiated exchange price, broadcasters are getting the opportunity to compare microwave products feature for feature, check out performance and ease of use. The six vendors are starting to see some

favorites emerge.

Post 9-11 security measures have limited areas where news vans are allowed to drive, and have meant closing building doors that used to be left ajar for cables tethering the cameras to transmitters outside. Those actions have spawned the need for wireless methods of connecting cameras to trucks.

"There's more and more demand for camera-back radios than for just tripod-mounted or portable transmitters," said Dan McIntyre, vice president at MRC in Billerica, Mass. As a result, MRC came up with its PTX-PRO Transmitter Unit.

McIntyre pointed out that even though the PTX-PRO may be replacing an analog tripod mount or van mounted transmitter, as long as the cost of the camera-back transmitter is comparable to the radio it replaces, the Sprint Nextel agreement allows stations to mix and match.

MRC is also seeing a good demand



The RF Central PHT portable high power transmitter radio

for its CodeRunner 4 Analog/Digital Central Receiver.

RF Central has reported a lot of interest in its PHT Portable High Power Transmitter radio. "It allows stations to make any vehicle a news vehicle on a moments notice, without huge expense," said Jim Malone, chief technology officer for the Carlisle, Pa.-

SHOPPING, PAGE 26

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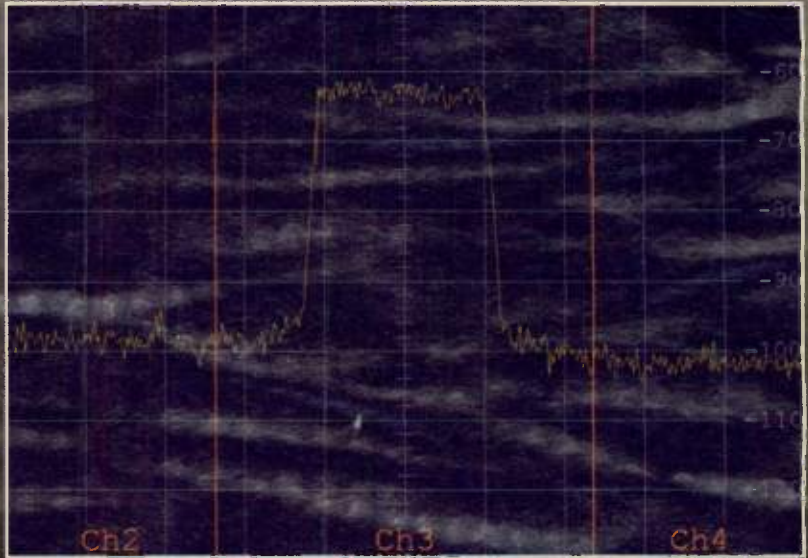
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Shopping

CONTINUED FROM PAGE 24

based company.

Malone said the only modification the PHT requires of a news vehicle is that it be wired up to supply DC to the transmitter. "Hook the transmitter up to that, literally put the antenna through a window to a magnetic-mount, and they're on the air."

Use of a radio such as the PHT would not have been possible in the analog world, said Malone.

"In the digital environment, COFDM, you don't need as clean a path, so you don't need as much of an antenna system as you did in the past, especially like in the 10-15 mile and under category, or in urban environments where you have tons of reflections."

MULTIPLE MODULATIONS

Nucomm said it is doing BAS radio replacement business with its ChannelMaster portable and van-mounted transmitters, and with its CR6D Central Receiver.

"We've integrated multiple modulations into the radios," said John Payne, chief engineer at Nucomm in Hackettstown, N.J. "We've integrated all the latest demodulator chip sets, so we're running fifth generation demodulators for VSB inside the central receiver. Everything auto-selects between VSB and COFDM, so the user really doesn't notice anything."

He said a novice operator would deal with only a standby/transmit and a high/low button, "but it [also] has great advanced configurations for the advanced user, the seasoned guy, that



The BMS Truck-Coder II

he can do right through the front panel," said Payne. "He doesn't need any special software to load, dongle cables and all that sort of thing."

Broadcast Microwave Services (BMS) has found its Truck-Coder II rack mounted mobile truck system

and its CRS-DCII Central Receiver doing good business in BAS equipment replacement.

"They're dual mode, analog and digital, so they give you the ability to continue to operate in the analog mode and then switch to digital when [the market] cuts over to digital," said Robert Bauer, director of sales and marketing at BMS in Poway, Calif.

He also pointed out that the Truck-Coder II's ability to store up to 100 pre-sets makes it easier for less skilled operators to use it in the field.

"Engineers can program the pre-sets... and you can just take them out, hit a pre-set button and then fire it up. For whatever environment you're in, hit a pre-set, and you're on the air."

Moseley Broadcast in Santa Barbara, Calif., took a slightly different path from the other vendors in its ENG microwave products.

Touted as "the hottest product for the BAS conversion," company director of engineering Sunil Naik said that, unlike other radios on the market, the



The Moseley Broadcast HD-2200 High Definition ENG Link

Moseley Broadcast Event HD-2200 High Definition ENG Link "is not a COFDM unit; it's our own version of the modulation scheme. The advantage there is the data rate that is offered is 27 Mbps, which is similar to what's coming out of these Sony [HDV] cameras and the JVC 720p cameras."

Naik said that placing a low-cost Miranda ASI-Bridge CAM HDV to an ASI converter between the FireWire output of the camera and the ASI input on the Event HD-2200 allows the station to pass high-definition video through its microwave system at little extra cost.

"Once it's in the ASI domain you can use any ASI decoder on the receive end," he said. ■

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Keeping an Eye on the Signal

In the digital world, new tools simplify live-shot monitoring

by David P. Otey, CPBE

CENTENNIAL, COLO.

Users of the BAS band at 2 GHz are experiencing a change in band plan and, along with it, a rapid change in microwave technology from analog to digital. Nowhere is this change more acutely felt than in newsgathering operations.

The most obvious change—the one most often mentioned in training sessions the author has conducted—is the way digital ENG systems break the familiar linkage between the quality of the shot and the quality of the resulting picture. Examined from another perspective, this behavior describes the primary user-benefit of such technology: a D-ENG system performing correctly will deliver to the video monitor a nearly perfect picture under a wide range of path conditions. While clearly beneficial in many ways, this characteristic presents a challenge to D-ENG operators at the receive (or studio) end of the system.

Consider a typical “tech monitor” position in a TV news-operations center. Besides a video monitor, it probably includes a waveform monitor, vectorscope and audio monitor. To an experienced operator, these monitors reveal much about the quality of an analog live shot. Noise from a poorly tuned or obstructed shot shows up not only in the picture but also in the sync tips of the waveform monitor and color-bar dots on the vectorscope. Interference from another user can often be identified and traced to its source just by examining the video monitor. Dropouts or noise hits in the audio may indicate multipath degradation affecting the audio subcarriers. In other words, a wealth of information is embedded in the program output of an analog system. A digital system strips this information away.

TWO SOLUTIONS

The key to a successful transition to D-ENG technology is understanding where to find this “missing” information. Two powerful new tools found in most D-ENG systems are intended to do just that. One is the spectrum monitor, a simplified version of spectrum analyzers which have long been used for diagnostic purposes and for tuning in satellite feeds. The other tool goes by different names according to the receiver manufacturer; for our purposes we will call it the quality meter.

A spectrum monitor for use in D-ENG systems consists of two parts,

linked by a data communications channel. The RF portion of the instrument is collocated with the ENG central receiver. Depending on the choice of vendor, this part of the instrument may take the form of a circuit board



A TV engineer monitors multiple signals selectively: 2 GHz RF, L-Band, 70 (800) MHz IF or interference signals.

built into the receiver, an optional module inside the remote-control interface that typically shares rack space with the receiver, or a stand-alone chassis elsewhere in the rack.

The instrument display consists of a computer window located at the control point. The choice of vendor and the user's preference determines whether the spectrum display is windowed within the remote-control interface or in a separate application on the same or a different computer monitor. In any case, it should be readily visible to the receive-site operator.

The most popular configuration is to feed the spectrum monitor with the first IF (intermediate frequency) from the receiver—that is, a signal that has been pre-scaled, or downconverted, from nominally 2 GHz to nominally 800 MHz, with no other processing applied. Monitoring the signal at this point in the path avoids introducing the confusing effects of IF bandpass filtering and automatic gain control. Because of pre-scaling, the first IF is constant in frequency regardless of the actual channel frequency. Thus, monitoring requires almost no operator intervention: the desired signal, if present, will normally appear centered in the display window.

In training sessions with actual equipment from a variety of manufacturers, operators having little or no prior exposure to spectrum monitors quickly make the connection between the height and shape of the spectral display and the quality of the signal path. In the digital world, the uniform distribution of energy across the chan-

nel results in a quasi-rectangular display called a pedestal. (Colloquial names for this waveform include “haystack” or “Bart head” in recognition of Bart Simpson's distinctive profile.) If the pedestal appears tall and

flat, with straight sides, all is well. Sloping shoulders on the side indicate that some amplifier in the system—either the final amp in the transmitter or a low-noise amplifier in the receive antenna, most likely—is being driven into saturation, so the transmitter operator should switch to low power. A tilted, notched, or rippled top to the

pedestal may indicate multipath conditions. While D-ENG systems have some built-in immunity to multipath, such a display may suggest to the operator a need to try a different antenna angle to improve the path.

MILE MARKERS

But what does “improve” mean, exactly, when such impairments cannot be seen in the video? This is where the other new tool comes in. The quality meter can be thought of as a series of mile markers indicating the receiver's distance from the infamous “digital cliff”—the point where the recovered program content changes precipitously from virtually error-free to unrecoverable. While its name and implementation may vary with the manufacturer,

the quality meter is a feature of most current-generation D-ENG receivers.

In simplified terms, the quality meter shows something akin to signal-to-noise ratio. To be more precise, it indicates how accurately the received RF waveform conforms instantaneously with its expected values, taking into account the total effect of added noise, multipath effects, and interfering signals. Unlike bit-error rate, a quality meter reveals path degradation before it reaches the point of penetrating the digital envelope and corrupting the data within.

And how is this information revealed? This is where the vendors' differences show up. Nucomm uses a percentage scale in its CR6D receiver, whereas the MRX4000 digital decoder from Microwave Radio Communications uses a numeric scale from zero to nine, just to give two examples. More important to the operator, the quality meter is clearly displayed as a vertical bar graph in the user interface of remote control systems from vendors such as N Systems and Troll Systems.

Between them, these two new tools—the spectrum monitor and quality meter—more than make up for the loss of subjective quality indications in the program monitor. The spectrum monitor gives the receive-site operator an intuitive, easily interpreted indication of signal strength and channel conditions, while the quality meter quantifies the result in a single number. With experience, the operator quickly learns where his or her comfort zone lies on the quality meter scale, and which range of values mean “better keep an eye on this shot before putting it on the air.” ■

Small

CONTINUED FROM PAGE 22

analog signals.

You might be surprised that those shots hampered by multipath or manmade noise now start to come in just fine.

Training is something to be determined by each station. In our case we elected to go it alone, but our staff is made up of highly technical people, some of whom are amateur radio operators, so it was not too hard to grasp the concept of operation.

The hardest part was getting people to understand that digital is there, or not there. The operators didn't

have the option of determining picture quality by rocking the antenna. With a digital system it is necessary to observe the quality meter, RSL, and BER readings. One thing we didn't think of, (brain still in analog mode), was the latency of the digital signal.

This posed a slight problem when we did a live shot when the anchor, who was listening “off air,” could hear the delay.

The problem was solved by using a 450 MHz remote pickup link to feed program audio to the truck that could be interrupted by director's cues. ■

Frederick R. Vobbe is vice president and chief operator of Lima Communications Corp.



Progress

CONTINUED FROM PAGE 21

obtain reimbursement from Sprint Nextel.)

- Purchase orders should be faxed to Sprint Nextel at 866-221-5959.

Once Sprint Nextel receives the purchase order, Sprint Nextel will confirm its accuracy against the Schedule D in the FRA and will forward it to the manufacturer, who in turn fulfills the equipment order. After you submit your purchase order, you should then begin the FCC's license modification process right away.

NEW EQUIPMENT & PACKING SLIPS

Once your new equipment arrives from the manufacturer, you should immediately check the contents of the cartons for accuracy and check to ensure the equipment has not been damaged. Then confirm delivery by signing the packing slip and sending it to Sprint Nextel. (Packing slips should also be faxed to 866-221-5959.) It's only after this step is taken to confirm receipt of the equipment that Sprint Nextel can release direct payment to the manufacturer.

Once delivery is confirmed, go ahead and install your equipment, or have it installed by your contractor. Because the new equipment operates on both 12 MHz and 17 MHz channel plans, you can immediately begin to operate, "narrowed-in-place," in the old channel plan. That way you can become familiar with the new equipment before transitioning to the new channel plan.

Let your regional Sprint Nextel team know that installation is complete, and once all broadcasters in your market have installed and tested the new equipment, the regional Sprint Nextel team will assist in a market-wide relocation weekend.

REIMBURSEMENT

For certain other expenses outside the Sprint Nextel direct-pay arrangement with equipment manufacturers, there is a separate reimbursement process that functions on a monthly cycle. Such expenses might include integrators, or a station's internal labor costs for installation.

Things to keep in mind for reimbursement:

- An FRA must be in place before any reimbursements are paid.
- Every reimbursement request must be accompanied by a signed receipt and summary cover sheet. You can download the expense cover sheet from the www.2GHzrelocation.com Web site.
- Like purchase orders and packing slips, reimbursements should also be

faxed to 866-221-5959.

- You must submit the reimbursement request by the 5th of the month order to be included with the next month's payment. We're encouraged about the

progress we've made in 2006. Still, there is a tremendous amount of work that needs to be done and we will all have to redouble our efforts in 2007. Sprint Nextel will do so, and it's my hope that our friends in the broadcast

community will match and even exceed that level of commitment. In the end, all parties involved will benefit from the 2 GHz transition, and we're eager to move forward with you to complete this important work. ■

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Broadcast Sports, MRC 'Link' Up

Maryland camera systems provider places largest 2 GHz order to date

by Ken Freed

ODENTON, MD.

In the single largest equipment deal so far in the 2 GHz broadcast auxiliary service relocation transition, Wescam Broadcast Sports recently inked a \$12 million order with Microwave Radio Communications (MRC) who will provide more than 100 remote cameras from Link Research in Watford, England. Both MRC and Link are owned by Visilink, a broadcast equipment vendor in Bristol, England.

Broadcast Sports is a significant provider of microwave transmission and custom remote controlled miniature camera systems. Starting 20 years ago with onboard cameras for NASCAR's Daytona 500, the company today supplies turnkey RF systems for such sporting events as the Olympics, football, basketball, baseball, yacht racing, horse racing, nearly all auto racing, and 70 percent of the professional golf coverage.

"We went with Link Electronics because of the HD video quality of their proprietary encoding system," said Peter Larsson Broadcast Sports general manager. "They also have remote signal latency down to one or two frames, and that's unbelievably critical in sport coverage."

Broadcast Sports expects delivery of the first remote cameras to be delivered by the end this month, according to

Larsson. "We already plan to use these RF cameras for the CBS coverage of the Buick Invitational," a golf tournament in San Diego slated for Jan. 26-29," he said.

THE RIGHT TIME

Buying the new RF equipment was necessary because the FCC mandated that television broadcasters, fixed-link users and others operating within the 1990-2110 MHz spectrum band (BAS channels 1-7) must replace or upgrade their 2 GHz transmission facilities to operate within 2025-2110 MHz.



A cameraman uses a Link HD wireless system to transmit HD video during NBC's "Sunday Night Football."

In a deal with the FCC, Sprint Nextel will be given part of BAS Channel 1 in exchange for relinquishing spectrum at 700 and 800 MHz; plus Sprint Nextel has offered to cover broadcasters' costs for upgrading or replacing microwave transmission and

reception gear affected by the entire 2 GHz relocation. As the transition coordinator, Sprint Nextel must authorize purchase orders placed with approved microwave equipment vendors.

"[Sprint] Nextel's timing is phenomenal," Larsson said. "We're now making the transition to HD, but without Nextel, it does not make economic sense for broadcasters to replace their microwave equipment now. Nextel has given us an opportunity to do replacements on a one-to-one basis. Of course, we still have to pay extra money for products that can be upgraded to HD."

Larsson agreed that the BAS transition process has been much slower than the broadcast industry expected.

Larsson said that because of the size of the order and the exacting requirements of Broadcast Sports, Link developed a brand new RF camera for them instead of offering gear in their existing inventory.

"I assume Link will make this camera available to others to recoup their development costs for us, but I don't think it has a part number yet."

According to Warden Newlin, the Los Angeles-based director of Link Research in the U.S., "Broadcast Sports came to us

because of our ultra low delay encoding technology for HD systems."

Newlin said the Link ULD transmission system with the L2132 receiver/decoder offers only a 45 ms delay from video in to video out at true 720p, 1080i and 1080p with no downsampling. The system complies with MPEG-2 4:2:2 and 4:2:0 at 6 Mbps to 80 Mbps, with contribution quality at 18 Mbps and high quality HD as low as 8 Mbps.

Compatible with DVB-T, the Link Modulation Scheme uses the L1403 transmitter operating at 1.95 to 2.7 GHz with 100 mW. The system has two HD-SDI and ASI inputs and outputs, plus two stereo mic/line pairs.

Newlin said the proprietary LMS-T Advanced COFDM Modulation HD wireless system is "as rugged" as SD wireless, and it functions at 9.4 MHz (versus DVB-T at 7.61 MHz), "which offers a 2 percent higher throughput from this alone. Our proprietary LDPC error-correction scheme provides the most powerful error correction currently existing, and it supports a further 33 percent throughput improvement with deeper interleaving for greater burst error resistance. Overall, our LMS-T has 65 percent more throughput than DVB-T with more reliable RF performance."

AKIN TO WIFI

Newlin noted that as broadcasters integrate wireless technology into their productions, they need a next-genera-

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tion system with a wider data pipe that's akin to the WiFi system for computers.

"The difference is that when video comes out of the spout at 18 Mbps minimum, you can't slow the data rate like you can on the Web, or else you end up with video pixilation," he said.

When Broadcast Sports came to Link through MRC, Newlin said, "we looked at what was on the market and our own inventory. We realized that if we're going to do sports wireless, we need a more robust way to make the RF links work in the new 2 GHz environment.

"We'd already started working on a software-based video encoding solution back in 2000, a solution that would work with the encoder board we make for MRC. We stepped up this effort in 2005 for Broadcast Sports, and by the end of 2006 we felt confident that we had something that would meet their needs."

The chief challenge was being able to handle 20 to 30 RF links within a single event, Newlin said.

"We developed a fully agile bandwidth plan that lets the user program a frequency into each unit ahead of time, but also lets them change frequencies on the fly, like if there's unexpected interference from some outside source, which seems to happen every time."

This allows Broadcast Sports to adjust its RF frequencies for events in markets that have not yet relocated their BAS bandwidth, he said. "They still must go through the local assigned frequency coordinator for each venue, but this lets them choreograph each production, so they have the agility to adapt as needed to every venue."

According to Dan McIntyre, vice president of the 2GHz BAS Relocation Project at MRC in N. Billerica, Mass., "We have been working with broadcasters for more than two years to evaluate the 2 GHz BAS relocation needs, designing and quoting systems to meet their needs. Many customers are taking advantage of the transition to enhance the equipment that Sprint Nextel will pay for, such as higher bit-rate transport and better positioning themselves for future HD broadcasting. The platforms that broadcasters select now will greatly determine what they will be capable of doing over the next five years, that is, unless they are willing to wholesale replace their systems, at their expense, in a couple of years."

McIntyre noted the vast complexity of the BAS relocation project.

"Broadcasters had to determine the impact of the transition. Inventories acquired over decades had to be verified. Contracts had to be negotiated. Equipment suppliers had to expand capabilities. New end-to-end systems

had to be designed, quoted and approved. This made for a slow start. The project has picked up considerable speed in the last few months, and MRC has seen a significant increase in orders from broadcasters."

Larsson said the change would be "very interesting. The new systems from Link will make our transition more simple, yet we'll have to learn to work differently. I expect there to be logistical and technical problems that

will require a lot of cooperation and understanding between ourselves and the local frequency coordinators." I'm not saying how exactly we'll do it, since we're operating in a very competitive environment." ■

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FOCUS ON EDITING

Jay Ankeney

What Editors Wish For in The New Year

The beginning of a new year is a time to look forward. So for this year's "Editor's Wish List," I was able to harvest some terrific suggestions from a variety of innovative post pros about what they would like someone to come up with to make their post-production workflow easier. Later this spring, system manufacturers at NAB2007 will be telling us how they intend to mold the future of editing. But this month, it's our turn to mount the soapbox.

Leslie Allen is an editor using Adobe Systems software who also owns Cin-

ergy Creative, a full service production and design studio in the Hollywood area creating visual imagery and effects for broadcast, film, and new media. Considering the high cost of renting

chores.

"This would provide smaller facilities with a pseudo machine room on call 'round the clock," Allen said, "and editors could send in their timeline to



Leslie Allen, owner of Cynergy Creative in Hollywood

"Editors could send in their timeline to the facility over the Internet."

—Leslie Allen,
Cynergy Creative

HD decks for mastering digital projects, he'd like to see an external facility that could handle those record-to-tape and digitize-from-tape

the facility over the Internet. That company would then lay the material off onto a chosen tape format and deliver it to clients wherever in the world they

people are tempted into going with overloaded big name NLEs when they could get along just fine with far simpler systems that would be easier to use. Sort of like the old days of basic machine-to-machine tape editing; give them the ability to create high-quality masters and their lives would be much simpler."

HI-RES PODCASTING

Michael Cioni wears an editors hat among other responsibilities at Plaster City, an Apple-based independent filmmaker's post facility in Los Angeles. He'd like to put high-rez video podcasting on his wish list.

"Lots of productions want to have real-time editorial capabilities on their set, but editors prefer working out of their own bays and many of these NLE jockeys don't like being crammed into hotel rooms near on-site locations," Cioni said. "So we would like to stream dailies to the editor's preferred workroom with iTunes-style organization and get the edited results back to the remote location as fast as possible. A high-resolution video podcast could maintain the production-to-post link in real time."

Paul Nesmith, who is in charge of editing at Pixel Blues in North Holly-

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Michael Cioni, an editor with Plaster City in Los Angeles

"Many of these NLE jockeys don't like being crammed into hotel rooms near on-site locations."

—Michael Cioni, Plaster City

may be. Think of the savings on shipping tapes alone!"

Allen would also like someone to come up with a backup process that not only preserves an entire project, but is intelligent enough to individually save the work of each artist involved.

"Sometimes the graphics specialist may get so involved he or she forgets to save their work to a central storage system on a timely basis," he said. "My 'editors wish' would do it for them."

KEEP IT SIMPLE

Up in Canada, Andy Stinton cuts videos on Media 100 at Event Studio in Toronto specializing in staging special events.

"I think the over-sophistication of many edit systems is actually slowing down the workflow," Stinton said. "Let's face it, the vast majority of editing is simple cuts and dissolves, but entry-level prosumer editing approaches can't output to professional media. Too many

wood, enjoys using his Autodesk powerhouses, including flame and smoke along with several systems from other manufacturers. But he sees a need for client education to inform producers how to make best use of a new advanced technology capabilities.

"Because of the way software-oriented approaches keep getting cheaper, we need tutorials to teach clients to appreciate the fact that the lowest session charge for equipment may cost more in the end," Nesmith said. "I can do more in one hour on a smoke than could be accomplished in a whole day on a desktop system. So clients could cut their bottom line if they knew how to appreciate the appropriate technology to solve their problems, and manufacturers should constantly be providing DVD tutorials to help them figure it out."

When Peter Flack is editing high-definition projects with clients on his Quantel eQ system at Buzz N.Y., his partner,

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AUDIO BY DESIGN

Mary C. Gruszka

5.1 Source Channels for Digital Audio Consoles

Last time we looked at some general characteristics of digital consoles. Now we will look more closely at those specifically needed for surround sound mixing.

As Andrew Wild, vice president of marketing for Euphonix noted, "There are three areas of the console that have to fully cope with the surround signals—source channels, busses and monitoring."

Let's start with the source channels.

It may be stating the obvious, but the number of physical inputs to your surround sound digital mixing system (sur-

EVS channels do you expect to use and how many audio channels are associated with each video channel? How many sources from routing switchers?

And don't discount surround-sound microphones either. While they may not be needed for many typical day-to-day productions, there can be times when they're the best choice. When counting talent mics, remember to include any backup mics.

If you don't wish to frame-out or card now for future source requirements, ask prospective console manufacturers how

changes and how flexible the layers can be. Ask yourself how much scrolling through layers do you really want to do during a live production.

Today, many of the newer console systems offer flexibility in the way the channel strips can be operated. If you have a mono source, the strip is assigned to be mono. If stereo or surround, then the strip is assigned for these purposes. These assignments not only determine how many elements the fader controls, but also sets up the way the channel strip will function, like for panning and "spill."

or apply dynamics to all elements in the surround source from a single set of linked controls," he said. The spill feature "allows the operator to instantly spill out all six elements—L-C-R-Ls-Rs-LFE—of the 5.1 onto the console surface so that the individual elements may be adjusted if necessary. Metering of the channel should also be able to show all the six elements as a 5.1 meter. Euphonix allows the operator to work in mono, stereo, LCRS, 5.1 or 7.1 format. This is important, as there will always be differing number of different format sources for each show. The console must be flexible enough to allow the operator to work with any combination of sources encountered."

Next, Kevin Emmott from Calrec:

"A true surround-capable desk should provide comprehensive control of all the independent legs on a 5.1 channel. On a Calrec, surround channels use the resources of two stereo channels—for L/R



Euphonix Max Air

Now that you've got a handle on the number of required physical inputs, how many faders (channel strips) are you going to need? A lot will depend on the topography of the console system.



Euphonix 5-M 96-channel curved console

round console for short) will increase dramatically compared to stereo or mono. Instead of one or two channels per source, you'll be dealing with five or six channels.

Start by taking a survey of your sources. How many of your existing stereo or mono sources are likely to become 5.1 (that's six channels) in the next year, two years, five years and beyond? How many new surround sources do you expect to add within the same timeframes? Consider the complement of sources not only for typical productions like nightly news, and also for the most complex ones like election night coverage.

Surround sources may be more readily available sooner than you may think. As Kevin Emmott, marketing coordinator of Calrec said, "the reality of high-definition programming is that it will continue to create more demand for 5.1 content. We already see our customers needing more and more signal paths to create 5.1 channels even though HD programming with 5.1 audio is only just taking off."

DON'T FORGET THE REST

Of course, add up the expected stereo and mono sources as well. And don't forget graphics devices with their audio effects outputs. How many VTRs and server or

easy it is to add physical inputs to the console in the future. What are any limitations? How flexibly can a console handle your complement of analog and digital sources? And how easily can that ratio be changed in the future? (The same questions apply to outputs as well.)

Now that you've got a handle on the number of required physical inputs, how many faders (channel strips) are you going to need? A lot will depend on the topography of the console system.

A console could use six faders to accommodate one 5.1 source, or perhaps two stereo—for front and surround left and right; plus one or two mono—center channel and LFE channel if needed.

These faders can often be controlled as a group, but this scheme uses up a lot of channel strips for even a few surround sources, and you would end up needing a very large control surface.

One approach to reduce the number of faders is to use layers, letting one fader control multiple layers, which would be "hidden" underneath the fader. This keeps channel strip count to a reasonable number. But you'd want to make sure if there's enough layers to do the job, ascertain how easy it is to access the layers to make individual channel

Signal processing like gain, dynamics, equalization and delay, can be easily applied with a single set of controls to all of the channels comprising one source. But often, the audio operator needs to gain access to the individual elements as if they were independent channels. Perhaps the center channel needs boosting. Maybe the surround pair needs some brightening.

GO CONFIGURE

So here are some more things to consider when deciding on a surround console. How easy is it to handle the mix of mono, stereo, and surround sources, and how easy can this configuration be changed from show to show? Can fader strips be assigned to different types of sources, mono, stereo or surround? How easy is it to spill out the channels to make adjustments on individual elements? And what functions can be done while in spill mode?

To get a better idea of how this applies in real world consoles, let's hear from a couple of manufacturers.

First, Andrew Wild of Euphonix:

"The console must be able to cope with different format sources, each from a single channel strip and fader. The operator must be able to route, add EQ,

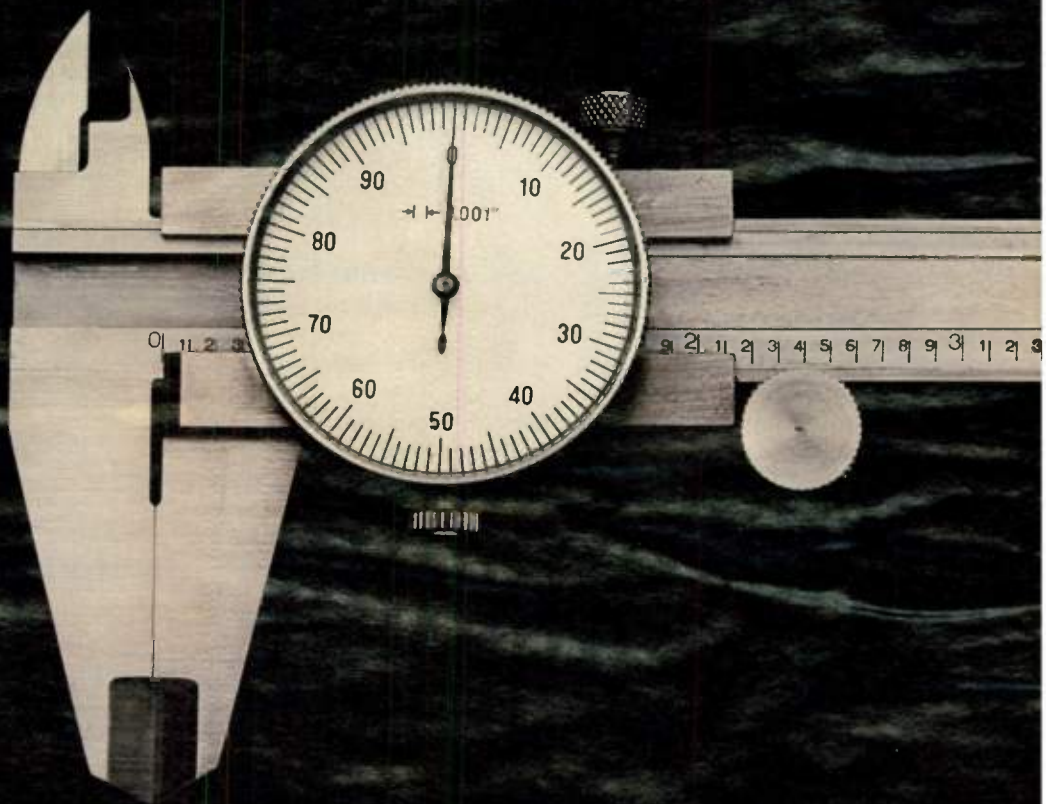
and Ls/Rs—and two mono channels—for center and LFE. These resources will be allocated from the available mono and stereo channels as the surround channel is assigned, and can be individually controlled on a dedicated surround spill panel on the control surface.

"The advantage of using stereo channels for the L/R and Ls/Rs rather than four monos is that it allows faster operation when the signals need to be adjusted separately from the surround channel. It also ensures that during adjustment, the overall balance of the surround channel is not upset, for example, by adjusting the EQ of the left and then the right channel. It also allows adjustment of the front and rear width of the surround signal which would not be possible if they are treated as mono signals."

We'll pick this up next time with some discussion on panning, delay and other DSP functions.

(Thanks also to Niall Feldman of Solid State Logic and John Gluck of Calrec, for valuable input for this series on surround sound consoles.)

Mary C. Gruszka is a systems design engineer, project manager, consultant and writer based in the New York metro area. She can be reached via TV Technology.



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THE MASKED ENGINEER

Mario Orazio

A-1 Broadcast Quality?
Here Comes Trickle Up

You might not have noticed that we don't all keep our personal helicopters in our garages. But, then, January is the coolest month, if not temperaturewise, at least at the great Las Vegas event, so I'm about to rant about consumer electronics.

I mean, wasn't the future grand? Methinks that by 1980, 50 years into the future for folks writing in 1930, we were all supposed to be commuting by air.

The 1939 World's Fair introduced us to the robots that were supposed to be our personal assistants by now. I'm still waiting for the shrunken doctors who can fix me from the inside the way they did in "Fantastic Voyage" in 1966, and I gave up holding my breath until I could book a Pan Am flight to the moon.

That last tidbit was from Stanley Kubrick's 1968 look into the distant future, "2001: A Space Odyssey." It wasn't just those commercial space flights that were supposed to be commonplace five years ago. We ain't yet got giant space stations with artificial gravity, bases on the moon or suspended animation.

There's a scene in the movie where an astronaut needs to get from a work pod into the main spacecraft through the vacuum of space without a pressurized suit. Now, then, in any other sci-fi movie, you'd just chortle at the asininity. But this was Kubrick. He researched it and found that the consensus of opinion in the space-medicine community was that the guy could actually survive.

So I'm willing to figure that the reason I can't fly Pan Am to the moon is that the airline went out of business 10 years before 2001, not on account of any lack of foresight on Kubrick's part. But then there's all the other wrong stuff in the movie.

In one scene, someone pops into a Bell System phone booth on the space

station and makes a videophone call home. Okay, so there's no more Bell System, but some of you may be wondering what a phone booth is and what the big deal is about a call with pictures. Heck, that tiny mobile in your pocket comes with a color camera and a color screen.

AND ANOTHER THING

Then there are the computers. They're mainframes.

"But, Mario, what's a mainframe?"

Exactly. If I told you Pan Am used to operate giant Boeing 314 flying boats, you'd probably ask me what sci-fi movie that came from. But flying boats were real, and so were mainframe computers—immense, centralized beasts with probably less calculating power than your digital-TV receiver. And that brings me around to my point, if I've got one.

In almost every area—transportation, building materials, food processing, sexless reproduction, world peace—the good old future ain't come to pass yet. But, in one area, it's so far behind the present that it's unrecognizable, and that area, dear pals, is consumer electronics. Moreover, that's getting to be a problem for those of us accustomed to having the best that TV technology offers.

Case in point: the broadcast-quality monitor. You used to be able to lord it over the poor schnooks who had to watch stuff on their home TVs. If only they could have seen it on the studio monitor!

Now, a bunch of you might have \$40,000 Grade 1 broadcast HDTV monitors that offer maybe 900 lines of resolution. And what do the poor schnooks have?

At the CEATEC (Combined Exhibition of Advanced Technologies) consumer electronics show in Japan, Sharp showed a 64-inch LCD TV with 4,096x2,160 resolution. Yes, that's the same as what the top-

of-the-line digital-cinema projectors have, and one whole heck of a



I love watching folks in our business trying to make their big walkie-talkies work over any sort of distance while nearby some kid is shooting the breeze over a cell phone that weighs less than a remote mic

lot better than the best monitor you own (unless you've got a Frontniche 56-inch LCD, in which case the Sharp consumer screen has only a little bit better resolution than yours).

Sony's new HVR-V1 HDTV camcorder is pretty cool; it's based on their consumer HDR-FX7. The technology eventually trickled up to broadcasters. When the little plane hit the building in New York last fall, Fox News got pictures on the air via a Treo smart phone. Heck, if you ain't prepared to put mobile-phone skills, video, and sound on the air, you're going to be scooped by some elementary-school blogger.

I love watching folks in our business trying to make their big walkie-talkies work over any sort of distance while nearby some kid is shooting the breeze over a cell

phone that weighs less than a remote mic. Or maybe our folks are dragging a CRT-based monitor over near where some toddler in a stroller is amusing herself with a portable DVD/LCD combo.

SOUNDS PRETTY COOL

Thank goodness we've got HD-SDI, so we can connect equipment with just one piece of coax that can handle almost 1.5 Gbps. Consumers just have HDMI, which, in version 1.3, goes to 10.2 Gbps. Oh, did I mention all the systems for wireless HDMI, so you don't need any cables at all?

Then there are the folks who think Rec. 709 color offers a wider gamut than Rec. 601. Nope. But, if you're looking for wide-

range color, check out IEC Standard 61966-2-4. It covers the consumer extended-gamut xvYCC system.

Struggling with your tape library that needs to migrate to a new medium every few years? Maybe you don't want to hear about Panasonic's new consumer optical disc with a 100-year-plus life-

time (it plays on consumer players, too).

I ain't saying you shouldn't visit Las Vegas in April to see what's new in "broadcast" equipment. But, for getting your socks blown off, you should've scheduled your trip three months earlier and attended the International Consumer Electronics Show. Heck, the National Academy of Television Arts & Sciences moved its Engineering Emmy Awards to CES this year.

Plan now for next year. Maybe, if you're lucky, some kid there will give you his 3 Gbps router when he spots a new one on the show floor.

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

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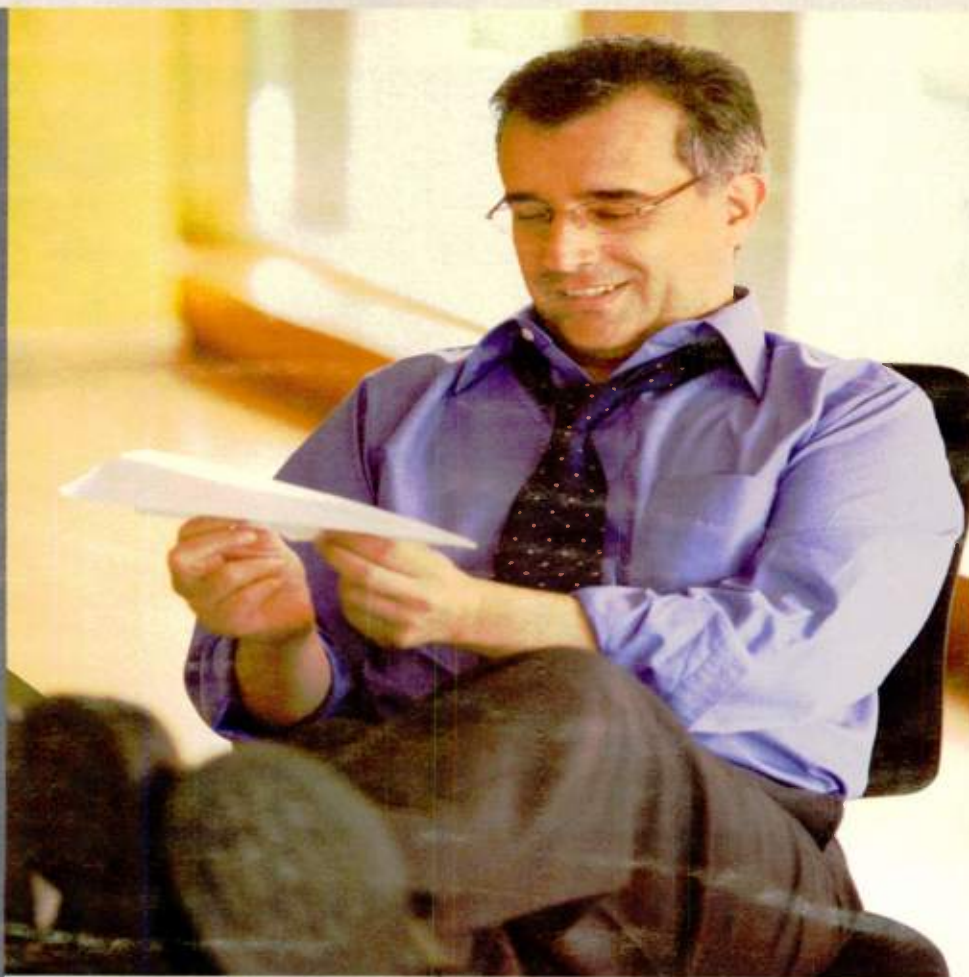
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Engineering The Broadcast Future

World Radio History

Wish

CONTINUED FROM PAGE 32

Michael Marinelli, is often polishing the 5.1 surround soundtrack in a separate Digidesign Pro Tools HD suite.

"I'd wish for the ability for my NLE to monitor those 5.1 tracks in the sound field Michael has created," Flack said. "I can always play the individual

audio channels for my clients, but I really need to import that mix from ProTools with all the tracks' spatial designation intact. If every NLE could have this uniform audio file exchange capability, it might also encourage the different networks to standardize their requirements for audio deliverables since the 5.1 specification is inherent in HD broadcasts."

Digital asset management has

become an increasingly important part of post production facility's services, but Michael Suggs, president and editor at Milagro Post in Southfield, Mich., where they service a lot of Detroit's video needs, thinks DAM should be a more open system.

"If our clients could access proxies of their own stored assets, they could jump-start their own projects," Suggs said. "Then the facility could be more

pro-active to their clients needs by providing higher-resolution functions on the same material. With a secure, shared asset management system, clients could instigate their own billing orders, order more mundane chores like extra dubs by themselves, and feel they have more control over their ongoing projects."

CUT THE CLUTTER

Mark Tyler, an editor at Home NYC on the 11th floor of a building overlooking Soho in New York, wants to cut the clutter with one universal format for all uses of high definition.

"I'd go with 23.98, 24p if I had my choice," Tyler said. "That would make it all a lot easier for a small shop like us to keep everything straight."

Once an editor's project approaches the completion stage, there is a growing need to get multiple levels of approval before finishing. Michael Kolowich, who edits at his DigiNova-

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"I think the oversophistication of many edit systems is actually slowing down the workflow."

— Andy Stinton,
Event Studio

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tions facility in Concord, Mass., wishes he could capitalize on the fact that almost all of his clients have broadband Internet connectivity.

"I would like to see every NLE have a one-button ability to convert a project to Flash video and then send the encoded FLV files to anyone who has a Adobe Flash Player for review. Just FTP it up to a server, send the clients a link, and collect and collate all of their comments. This would greatly facilitate our getting to a finishing point when lots of eyes have to collaborate on approval."

I received a flood of great ideas from many editors, and apologize that not all could be included. We'll check back as the year progresses to see if any of these ideas takes seed.

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

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THE BIG PICTURE

Frank Beacham

How HDTV Is Being Botched

One of the more ludicrous side effects of writing this column for TV Technology is that so many people think it qualifies me to fix whatever problem they are having with their home television set.

When the actor quips that "I'm not a doctor, I just play one on TV," I get it instantly.

This TV repairman thing goes back a long time—so long, in fact, that it once included a call to help a friend install a new rooftop antenna. Somehow he thought, with all my "inside" knowledge of television, I could help him get a better off-air picture.

These days the topic has shifted from antennas to HDTV. A couple of years ago it was mostly "which kind of display should I buy?" These days I'm hearing comments like "what a mess" or "this is more complicated than my computer."

Just as the actor who is not a doctor, I'm not an engineer. As a writer, however, I learned long ago to pay attention to the random comments of ordinary people. Very often, buried in such idle chitchat, are the seeds of a story.

With an ear to the ground, I sense trouble with HDTV. There's a grassroots discontent whose rumble is getting louder. It's not that people don't like HDTV. When they see it, they are impressed. So impressed, they are buying HD sets by the thousands.

The problem with HDTV is making it work satisfactorily at home. In a nutshell, the installation process is too complicated. It's a bit like a novice trying to set up a new PC. There are too many gotchas.

Before I saw hard evidence of this, I

HDTV owners don't even subscribe to a high-definition programming service. Of those that do get some HD service, most are not enamored with their programming choices.

Only 47 percent of people who bought

Once the HD display purchase is made, technology-phobic owners often find themselves in a spaghetti of wires trying to interconnect the display with a cable box, DVD player, and surround audio system.

heard about it from friends. In fact, I know personally of a couple of cases where embarrassed buyers of HD receivers went for substantial amounts of time watching standard-definition programming without knowing it.

CAN'T GET NO...

Because of these personal anecdotes it came as little surprise to learn of a recent study by Frank N. Magid Associates that found many HDTV owners dissatisfied with their program choices and confounded with the complexity of HDTV technology.

Magid found that about 30 percent of

HD sets in the past year did so looking forward to watching TV shows, Magid's data revealed. That percentage is down from 63 percent two years ago.

Enthusiasm for HD programming is dampened by too few program choices and incomprehensible pricing plans from service providers, the study determined. With so many HD set owners feeling "not tremendously satisfied" with their program choices, Magid suggests that potential buyers "are not hearing any word of mouth or buzz" about HD programming.

The other big problem is that many HD buyers find the technology too daunting. Once the HD display purchase is made,

technology-phobic owners often find themselves in a spaghetti of wires trying to interconnect the display with a cable box, DVD player, and surround audio system.

Incompatible standards have made simple plug-and-play systems a myth. A maze of remote controls can make system operation a ridiculously complex task for many people who simply want to watch TV.

Once the system is installed, what do most HDTV owners most watch? You guessed it, DVD movies. Not Blu-ray or HD DVD. Good old upconverted standard definition. Those movies look great, and many viewers—including myself—don't notice the difference with the higher resolution versions.

With the recent purchase of a new Macintosh personal computer, I unknowingly acquired a "stealth" HD viewing device with Apple's Cinema Display. Figuring I'd sample some off-air HD reception in New York City, I purchased an EyeTV Hybrid, a USB digital/analog tuner made by Elgato. I hooked it to a Terk indoor HD antenna.

As a truly plug-and-play device, it was probably simpler to set up than any standard alone HD system. When it works, it works well. The off-air images were quite nice, though local TV news, I found, was just as vapid in HD as in SD (that's another story).

The problem with this off-air reception, I learned quickly, is that it's not reliable. I get frequent demonstrations of the cliff effect, the "no signal" display when a station's signal is too weak to receive. This, unfortunately, is about half of the time in my Upper West Side Manhattan apartment. Fortunately, those SD DVDs I get from Netflix work 100 percent of the time.

Not including this past holiday, estimates were that about 15 percent of U.S. homes have purchased an HDTV set. Those sales were no doubt driven by attractive prices, space-friendly thin displays, and plenty of marketing hype.

Starting back in the 1980s with the technology greedfest called "the Grand Alliance" through the incompetent "DTV transition," the corporate and government backers of HDTV have managed to do everything possible to kill a potentially golden goose.

Now, mired in an incomprehensible maze of standards and formats, it's difficult for viewers to even know what is and isn't true HDTV. Retail sales people don't help, spreading a level of disinformation that is often shocking in its scope.

The time, however, is long overdue for the proponents of HD to get their act together and fix this mess. Confused and frustrated HD set owners are not good for business.

In a few years, of course, true and dependable HD delivery of all premium entertainment will arrive by default. But until that time, the proponents of HDTV—the ones who have botched the job at every turn—are getting exactly what they deserve.

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

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TUNING IN

Gary Arlen

Beyond B&W and Read All Over

As America's newspapers reinvent themselves, broadband video—including high definition—is part of their arsenal, raising the prospects of newspapers becoming significant local online HDTV purveyors.

From The San Diego Union-Tribune to The Washington Post, newspaper Web sites are producing HD video content, exploiting ways to leverage their local brands and add to their archival resources.

Newspaper HD production efforts reflect an array of approaches to broadband video, and publishers are developing alliances with local broadcasters and cable TV operators to share HD productions during this transitional period for both industries.

It's all part of the reconfiguration of the media landscape, with newspapers aggressively seeking to protect their role as young audiences defect to the Web. Moreover, the HD capability is a future-proofing feature as advertisers evaluate Web relationships.

Chet Rhodes, deputy multimedia editor for breaking news at Washington Post/Newsweek Interactive, or WPNI, the unit that runs WashingtonPost.com, foresees a day—"maybe within two years"—when HDTV will be the primary format of newspaper Web sites.

"The question is how soon can we afford to stream those files," Rhodes said, adding that MPEG-4 will make the process more feasible.

In the meantime, WPNI is accelerat-

ing its HD production and archiving via two routes. Rhodes is responsible for the unit that handles live feeds and reporter videos. The Washington Post has equipped 40 of its print reporters with Panasonic mini digital video cameras and asks them to feed video interviews and images to the Web editors in conjunction with their newspaper stories.

Separately, the Post's documentary unit has six professional videographers who accompany print reporters doing longer articles. The shooters generally come from a broadcast background and create more traditional documentary pieces, using Sony HDV cameras. Rhodes says that some of the still-frame grabs from the HD cameras are so clear that they have been used to illustrate articles in the newspaper's print editions.

That kind of crossover synergy is what newspapers want in today's belt-tightening environment.

The Post "began shooting everything in 16:9" format starting in 2001, Rhodes said. Originally, the company used Canon equipment, but was "floored by Sony's demo of HD cameras" at a NAB convention, he said.

Because it is shooting in HD format, many of the Post's Web site images show



Sign On San Diego, the Web site of The San Diego Union-Tribune, jumped into the HD world to provide video for use by TV nets, according to Ron James, content manager of the site.

up in widescreen format, even if they are not truly HD. A dedicated segment of the site called "Camera Works" exclusively displays widescreen pictures. (<http://www.washingtonpost.com/wp-dyn/content/photo/>) Segments shot with the Panasonic DV cameras are masked for widescreen, Rhodes said.

The Post's HD production process resembles that of local TV stations. Field video is captured onto Sony HDV decks, which lets editors tinker with it on laptop computers, using Final Cut Pro. The edited material is run through Sorenson Squeeze compression software from Sorenson Media, Inc. to turn it into Web video.

Like many other newspapers using Web video, WashingtonPost.com, collaborates with TV partners. MSNBC (both the Web site and cable TV channel) share video with WPNI. Rhodes said that Public Broadcasting Service and other networks have used WPNI video when it covers "big stories."

He acknowledged that "it's a pretty big step" to move into HD, involving a revision of the whole production chain including cameras, decks and tapes. And, Rhodes said, "It takes longer to do everything."

But that has not dissuaded the WPNI from pursuing HD.

"The next step is replacing tape altogether," Rhodes said, indicating that he is eyeing an upgrade to HD hard drive cameras.

IN SAN DIEGO

On the other side of the United States, Sign On San Diego, the Web site of The San Diego Union-Tribune, jumped into the HD world "primarily so that we can provide video that would be used in cable and broadcast situations," said Ron James, the Web site's content manager. The newspaper's content is being used for downloaded and on-demand projects.

James acknowledged the same major challenge to HD Webcasting as the Post's Rhodes cites:

"For online, it doesn't make much difference right now, and we wouldn't stream hi def simply because of the bandwidth and bit-rate necessary," James said. "We do shoot some of our video in hi def and then encode it into flash or Real or Windows Media which produces cleaner streaming video on the net."

The Post and Union-Tribune are among the dozens of U.S. newspapers accelerating their use of video on their Web sites. In a recent study of the 40 largest local papers, Broadband Directions, a Boston-area research firm, found that almost half the sites incorporate a mix of original video and third-party content (such as video from The Associated Press). Broadband Directions President Will Richmond points out that many of the sites have "suboptimal navigation"

and their storytelling is not yet well integrated. But he adds that the newspaper video is "essential" for newspapers to "re-energize their brands and importantly, to reconnect with younger audiences and offer compelling opportunities to their advertisers."

Newspapers' plunge into HD video coincides with the expectations of other organizations about the opportunities on the hi-def Web. In its year-end summary, research company In-Stat predicts that HDTV programming will become mainstream on the broadband Internet during 2007.

In-Stat cites a combination of technology developments and product introductions, such as Intel's quad-core central processing units that can easily handle HDTV and Apple's launch of HD versions of "download-to-own" iTunes movies. In addition, portable PCs powered by AMD and ATI chips that can include HDTV tuners and graphic accelerators open new doors for HD Web video—and for local newspapers.

The dinosaur publishers, best known for their dependence on dead trees and ink by the trainload, are trying to leverage their local skills into next-generation HD broadband publishing. Their efforts open opportunities for digital alliances—and/or competition—with broadcast and cable companies as well as new markets for technology suppliers who can support their broadband video agenda.

But don't expect kids on street corners to wave a portable media device and screech, "Extra, Extra. See All About It!" The HD image will beat them to it.

Gary Arlen is president of Arlen Communications Inc., a Bethesda, MD, research firm; he can be reached at GArlen@colum-nist.com.

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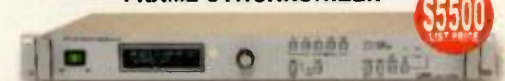
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EQUIPMENT REVIEW

Equipment and product reviews from professionals in the video industry

CAMERAS & ACCESSORIES

Canon XH A1 and G1 HDV Camcorders

by Carl Mrozek

HDV camcorders are getting smaller, better and cheaper, with more options that can be customized by users. It is now feasible, while in the field, to adjust parameters such as gamma, skin detail and paint and save the settings for later recall and reuse—all with an HD camcorder retailing for less than \$5K! One such marvel is Canon's new XH A1 HDV camcorder.

The XH A1 is actually one of a pair of new HDV camcorders from Canon. The other is the XH G1, which is essentially the same, except for a "Jack Pack" that includes genlock, timecode and HD SDI output.

FEATURES

The XH G1 and XH A1 should look familiar to anyone who owns or who has used the Canon XL G1 or XL G2. They have similar form factors and a similar menu of operational modes.

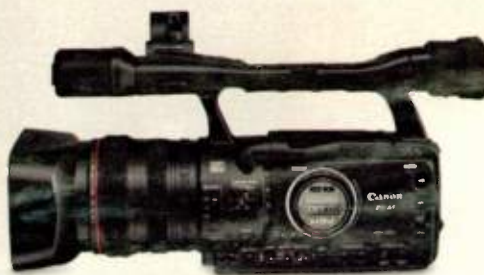
The XH A1 and G1 have a long list of distinctive features including 3 and 1/3-inch 1440x1080 native 16:9 CCD imagers. The cameras provide true 1080

image capture at several frame rates and use the new DIGIC DV II HD image processor that provides advanced noise reduction and accurate color reproduction, especially for skin tones, and which gives enhanced latitude for clean HD imagery.

Both the XH A1 and G1 have identical built-in 20x HD lenses. Focal lengths range from 4.5 mm to 90 mm, equivalent to a 32.5 to 650mm zoom on a 35mm camera. The optics provide high contrast, resolution and clarity and optimal color reproduction, and come with 16 different pre-set zoom speeds. There's also a high speed and variable zoom setting. Maximum aperture is f1.6 when zoomed out to 35mm.

The lenses feature Canon's enhanced optical image stabilization, which compensates for operator hand shake, vibration and general bodily movement (although it doesn't correct for sudden, sharp movements). The resulting images are much steadier and smoother. The autofocus feature has been improved, giving faster focusing and the ability to hold

focus better than with previous technology. The manual focus ring is also tight enough to hold focus when not being manipulated, yet it still rotates easily and smoothly. The same is true for the iris ring, which makes it feasible to continually adjust exposure from a max aperture



The Canon XH A1 HDV camcorder

of f1.6 to a minimum of f9.5. This facilitates manually fading in and out. There's also an exposure lock button to hold a preferred f-stop.

The cameras are equipped with two high resolution color viewfinders—a fairly typical adjustable eyepiece with a rubberized eyecup, and a flip-out widescreen 2.8-inch LCD external viewfinder/mon-

itor. The latter rotates in a continuous 270-degree arc, which greatly enhances utility in extreme angle shooting.

A new feature from Canon is "total image control," with 23 different image control variables, 21 custom display functions and 32 custom operational functions to achieve the desired "look." Key variables include knee, gamma, master pedestal, setup level, sharpness, color matrix, color gain and color temperature. In addition, there are new tools for adjusting key video parameters in hue, chroma, brightness and spectrum (area). Skin detail and sky detail functions make it convenient to heighten or attenuate details in these areas as well.

Up to nine customized camera setups, with the full range of modified parameters, can be stored in memory as presets. Two presets are instantly accessible via buttons. Presets can be easily transferred to other XH G1 and A1 camcorders via memory cards and the new software. This software includes Canon Console Image Control and Storage Software Version 1.1. Both run on a laptop or desktop computer and provide remote control over camera settings and operations. They include some new functions not feasible



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FAST FACTS

Applications

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Features

1080i video; 20x zoom; super range optical image stabilization; 23 image parameter presets

Price

XH A1 - \$3,999; XH G1 - \$6,999.

Contact

Canon USA Inc.
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within the camera menu, such as vectorscope and waveform monitoring.

Audio recording in the camcorders is handled with a built-in stereo microphone. The audio recording pattern can be adjusted, and there's an internal windscreen. Onboard mic sensitivity is

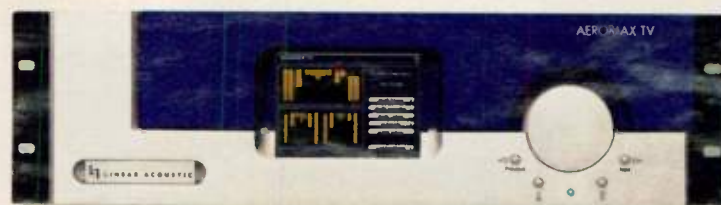
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LA-5448 Synchronizer



The Model LA-5448 AC-3 Frame Synchronizer and Rate Shaper can accept up to four independent AC-3 programs, re-synchronize them to a local reference, protect against bad frames by repeating or inserting known good silent frames, and selectably rate shape outputs up to a fixed rate of 384 or 448 kbps regardless of input data rate.

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Canon

CONTINUED FROM PAGE 48

adjustable and the record level for channels one and two is adjustable via thumb dials. These adjustments are also available when using external mics.

IN USE

I received the XH A1 along with Canon Console Image Control software pre-installed on a laptop. The camcorder was essentially straight from the factory—

including all settings. After inserting a battery, I turned the familiar Canon power dial to the first position—automatic—and aimed at my dog. In the viewfinder I saw his head and shoulders properly focused and exposed in living, natural color.

With the A1's 4.5 pound weight, comfortable handle and rotating flip-out color viewfinder, it seemed second nature to use the camcorder for low angle shots, including extended tracking shots I typically wouldn't try with a larger camera. I continued with the canine theme, grab-

bing more shots of my dog from ground level. Suddenly, I could see the world from his perspective, with startling color and clarity. Outdoors, with help from Canon's Optical Image Stabilization system, I was able to smoothly follow him down a twisting trail. I was particularly impressed with the A1's ability to find and hold focus on my dog as we ambled down the path.

While it doesn't replace a Steadicam for long continuous shots, the onboard gyro-stabilizer does a creditable job of smoothing out pans, tilts and short tracking shots on

flat ground. Moreover, along with the flexible viewfinder, it allows an entirely different style of handheld camera technique—with more fluid vertical, horizontal and diagonal movement. While hiking along a trail in snowy woods I was able to transition from tracking shots to tilts and zooms, often without resetting the shot.

I tried some of the custom presets in the menu, including the Cine 1 and Cine 2 gamma settings. Cine 1 is recommended for video being telecined from film, while Cine 2 is geared for video being transferred to film. Before reading the man-

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ual, I was unaware of these differences and assumed that both were geared to deliver a film "look." Hence I was a bit underwhelmed with the Cine 1 setting, even though it is warmer and more intense than the factory or custom video modes. Later, I learned that with the Cine 1 preset, gamma is not highly elevated and doesn't really emulate Kodachrome.

By contrast, the Cine 2 settings were more intense and more like film, with warmly saturated colors, especially the reds and greens of Christmas. Even when shooting indoors in ambient light, the warm tones, richly saturated colors and crushed blacks yielded imagery much more film-like than the typical video. Actually, it was a unique blend of film and video, as I elected not to shoot in 24 fps. The result was rich, vibrant film-like color, but with video's 30 fps tempo.

Occasionally, I tweaked the film-look settings on the laptop with the help of Console, or abandoned them entirely for one of the video presets. I wanted to emulate the intensely saturated Kodachrome "look." This generally worked well outdoors, under both blue skies and lightly clouded conditions.

Surprisingly, it even worked fairly well under ambient street lighting intermixed with halogen lighting and quartz stage lighting too. Does this sound familiar? If so perhaps you probably attended an urban New Year's Eve ball drop. This year's event in Buffalo also included a car drop—a new Ford Edge being lowered from a monster-crane. The car was bathed in halogen lighting. The big challenge here was to balance for the halogen lamps, streetlights and quartz stage lighting without switching settings. In this shoot, the prime subjects were the crowd, the car, stage-lit dignitaries and intense fireworks. Each was illuminated with different color temperature lighting, and throwing extra light on the subjects to unify color temperature was not an option. Instead, I had to rely on the camera's image processor to average it all out.

The processor did a pretty good job of this, delivering video with subtly different hues in different areas, but with proper overall color balance, or nearly so. The net result was lots of intense color with subtle hues sometimes only faintly visible to the eye. At times, the crowd was slightly greener or redder, but always with accurate primary and secondary colors underneath the tint. This was evident in close-ups in all sections of the square. With the plethora of vibrant colors and hues, this nighttime event hardly seemed nocturnal.

For audio, I used the built-in mic, which had to cope with blaring music and crowd noise. In general, I was satisfied with the resulting audio.

SUMMARY

Although I evaluated many of the XH A1's features, I only scratched the surface in terms of its custom settings and new features. The A1 passed every one of my critical performance tests, including its "trial

by drowning" in the intermittent downpours at the New Year's Eve event.

The camcorder's color reproduction, resolution, exposure and latitude, optical stabilization, flip-out viewfinder and tape transport all performed well. The ability to manipulate so many picture parameters and view them instantly on the computer screen with Console adds a new dimension of image control in the field.

The great imaging capability, coupled

with light weight, solid ergonomics, accurate auto focus and a flexible LCD monitor allowed me to shoot HD in an exciting mobile, yet even-keeled manner. Results are key with any camera. The XH A1, and presumably its cousin, the XH G1, easily make the grade. Anyone who needs a light, reliable HD camcorder for standard, special and even extreme applications should take a good look at these cameras. Having road-tested Canon's first HDV

camcorder, the XL H1, a year ago, I was truly impressed with the number and scope of refinements incorporated into these new camcorders. Now if only the otherwise identical 20x lenses were interchangeable!

Carl Mrozek operates Eagle Eye Media, based in Buffalo, N.Y., which specializes in wildlife and outdoor subjects. Contact him at eagleeye@localnet.net.

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VIDEO PROCESSOR

Teranex Mini Digital Video Processor

by Michael Hanish

Moore's Law confirmed: faster, smaller, cheaper. The Teranex Mini is a marvel of digital video processing power, including real-time format conversion, image control and noise reduction, all packed into an extremely small footprint (5.5-by-10-by-2 inches).

Teranex made a big splash at NAB several years ago when they showcased pristine scaling and noise reduction systems on custom chips. They have recently been made a division of Silicon Optix, and one of the first fruits of that union is the Mini series of converters, designed for production trucks, projection systems, camera monitoring systems and, in general, any situation where high quality demands meet space limitations.

FEATURES

The Mini comes in several flavors, with the price varying slightly, based on the feature set. The full package includes up, down and cross-conversion, along with aspect ratio conversion, color space conversion, image processing, detail enhance-

ment and noise reduction. Input (and loopthrough) and two outputs are for SDI (SD or HD) signals, with optional DVI-I and/or HDMI available on the output side. Embedded audio is passed along with the SDI stream. There is no power switch, just a 12 V wall wart-type power supply.

Front-panel controls are sparse but sufficient: indicator LEDs for power, status and I/O format selection, and selector buttons to engage on-screen display, select input and output formats, and navigation and selection buttons for the OSD menus. There is also provision for infrared control, but that option was not made available for this review.

I/O formats are set on the front panel (480, 576, 720, or 1080); all other controls reside in the menus. The Picture Settings menu, aka Proc Amp, allows the usual adjustments: video gain (-6 dB to 6 dB), black level (-30 mV to 30 mV), saturation (-6 dB to 6 dB) and hue (-179 degrees to +178 degrees).

In addition, there are controls for sharpness and detail enhancement (soften to sharpen). The Aspect Ratio control pro-

vides four scenarios for addressing scaling possibilities: Common T&B ensure that the top and bottom edges of the input image match those of the output image (a 4:3 image scaled to 16:9 would appear in the center of the frame with pillar bars); Common Sides (similar to zooming into the scaled image—the screen is filled but approximately a third of the vertical information is cropped); Anamorphic (common top and bottom, but the image is stretched horizontally to fill the 16:9 frame); and Flexview (this leaves the center of the image intact, but applies increasing amounts of stretch toward the edges to fill the 16:9 frame). The names of the functions require some getting used to, but the output, which is extremely clean, more than justifies the effort.

The Advanced menu provides access to source selection controls, which optimize all the Mini's internal algorithms for either film or video originated source material, and compensate for cadence or interlace issues. The menu also allows access to the noise reduction controls. The noise reducer works by classifying each pixel as noise, motion or no-motion, and treating it accordingly. Pixels in motion are not touched, so as to avoid



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introducing processing artifacts. Noisy pixels are replaced by spatial processing; and no-motion pixels get their noise reduced via a weighted averaging over successive frames. There are three levels of noise reduction available, as well as none, and a split-screen mode to show before and after comparisons of the noise reduction processing.

Further menu controls allow the user to place the OSD menu at one of five pre-defined spots on the screen, save or recall all the Mini's parameters in one of five presets and select the frame rate of the incoming signal (59.94 Hz or 50 Hz). In addition, the Mini auto-detects timecode in the incoming SDI stream, delays it to match the time consumed by the currently running conversion process (either two or four frames), and then places it into the outgoing stream. In SD modes, a menu selection controls the placement of the timecode into a particular line.

IN USE

I plugged the Mini directly into the input path of my Media 100 HD system, from the output of a Kona analog-to-SDI converter to one of the SDI inputs on the Kona 3 (the OEM hardware used by the Media 100 HD). At this point in the signal chain, it was easy to see that the Mini, when not performing any conversion, image processing, or noise reduction, was 100 percent neutral to the signal, neither adding nor taking anything away.

FAST FACTS

Application

Processing, conversion and cleanup of video signals

Key Features

Small footprint, full range of conversions, accommodates all SDI video formats

Prices

\$2,995 to \$6,495 depending on functionality and options

Contact

Teranex
407-858-6000
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I used the noise reduction features extensively to clean up and reprocess some old Hi-8 and VHS tapes needed for a documentary. One important and historical VHS tape of a cable access show benefited greatly from the Mini's noise reduction and proc amp features. While digitizing the entire hour-long program from the VHS, I used the strongest noise reduction, along with a reduction in chroma saturation, phase correction, contrast boost and addition of back shadow detail. The results were on par with the original U-Matic tape when it was new. Using the presets, I was able to do comparisons of several noise reduction and proc amp settings and compare them inside the Media 100, choosing the best setting (also the ones preferred by the executive producer) to process the entire tape.

In other tests and uses, I found that the up, down and/or cross conversions were very clean and artifact free (both image and motion). All parameters were clear and simple to adjust, and the unit in general was extremely straightforward to install and use. I have a longstanding preference for power switches on all my equipment, but the absence of one on the Mini is not a big deal. The unit does have a fan, so it will add some noise to

your equipment environment.

SUMMARY

I would love to add the Mini to my setup, even though it duplicates (but easily exceeds and expands) some functionality already present in my signal path. After three weeks of extensive use and testing, I was nothing short of amazed by its excellent signal processing, noise reduction and scaling, along with its clean

and artifact-free output, and ease of use. It is a great integrating tool for multi-format systems, and a great problem solver in remote trucks, field production and HD shoots. I heartily recommend it to anyone needing these features.

Michael Hanish runs Free Lunch, a video/audio/multimedia production house near Guilford, Vt. He may be contacted at mhanish@sover.net



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HANDHELD ANALYZER

Hamlet Flexiscope Signal Analyzer

by Michael Hanish

The future has a lovely way of catching up with us. For years we have all watched sci-fi movies where someone flipped open a handheld device and analyzed the atmosphere or the state of someone's health. Some of what was imagined in those shows has come home to roost in the form of the Hamlet International Flexiscope, a handheld multifunction video and audio analyzer and picture monitor.

FEATURES

The Flexiscope can work with either SD, HD, or composite video depending on the module installed in the base unit. Changing the input module involves only removing two screws and then plug-and-play. Both modules feature a loopthrough and an external reference port, the latter of which doubles as the AES audio input. In addition to the power supply input, there is a USB port for transferring logged analysis information to a Windows PC and a headphone jack for audio monitoring. The internal batteries can be either

rechargeable NiMH or NiCad, or disposable alkaline, and provide the needed 12 V power for approximately four hours of use. Recharging takes about 12 hours.

Visually and functionally, the main feature of the Flexiscope is the 320x240 TFT liquid crystal display. The roughly 2-by-3-inch display is remarkably crisp and readable, both as a picture monitor and as a display, although it doesn't have a particularly wide viewing angle. Picture display aspect ratio can be set for 4:3 or 16:9, or even set to show the blanking area.

At the bottom of the display is a row of icons corresponding to the double bank of buttons below the display. These buttons allow the user to navigate among all the functions and parameters. It's all very clear and easy, once a small amount of time has been spent getting familiar with icon meanings and abbreviations.

This unit slices, dices and does everything in between. It has waveform and vector displays, of course. Display persistence can be set to single frame, infinite, or freeze; and the display can be magnified, shifted, ranged and/or recentered. Sync reference can be set for inter-



The Hamlet Flexiscope video and audio analyzer and monitor

nal or external, or to a unique Hamlet-trademarked function, "Hands Free Timing," which automatically shifts the display between internal and external sync, to clearly show timing errors.

The audio submenu is probably the most complex and is full of choices.

FAST FACTS

Application

Monitoring and analysis of video and audio signals

Key Features

Very portable; handles audio and video signals; built-in speaker

Prices

Base unit \$3,900; SDI SD/HD input module \$2,595; composite SD-only SDI input module \$1,095

Contact

Hamlet International
866-442-6538
www.hamlet.co.uk

Metering and monitoring are in stereo only, through either the headphone jack or a small speaker mounted in the lower front of the unit. Source selection can be from the four groups of embedded SDI audio, and stereo pair one or two from within each group, or from a discrete digital audio stream via the AES audio input.

HD Production Work Flow



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Metering can be set for one of six scales: BBC Type II, EBU, VU, Nordic, Digital, or DIN. Peak hold time can be set for off, or one, two, or four seconds, or it can be set for "infinite" hold. There is also user selectable two, three or four KHz de-emphasis. (or no de-emphasis.)

A menu item called "alarms" allows the user to select what error conditions should trigger an audible alarm and/or log entry, depending on whether the logger is running (about which more below). The nature of the errors recognized is different, depending on whether the input is SD or HD, but they fall into similar categories.

These include illegal values in the incoming video data stream; out of gamut values in the incoming video data stream; unit not locked to incoming video; illegal values in the ancillary data packets of the incoming video stream; full field, active picture, chroma, or luminance errors; EAV and/or SAV value errors.

The Flexiscope features an error logger, which can maintain a downloadable (via USB to a Windows PC) log list and/or display errors in the status bar at the top of the display. In fact, the Flexiscope can be operated remotely, to a limited extent, via USB and a Windows remote application, which unfortunately was not available for this review. With this application, you can get, print, or erase the error log, and download the currently selected Flexiscope display, either a single frame or continuously.

IN USE

For this review I used the SD model Flexiscope in a variety of situations in both my studio and on two shoots. In the studio, I kept the Flexiscope plugged into the composite output of my Media 100 board.

On the two shoots, I fed it composite video from my Sony HDV camera, once in an interview situation outdoors, and again while shooting landscape B-roll.

Usage, for the most part, is simplicity itself. Once you get a sense of the menu structure and the meaning of the icons and three-letter abbreviations, the operation of this unit is self-explanatory, which is a good thing because the manual is pretty much bare bones.

The menu structure is nicely designed—a back button on each screen allows you to reverse navigate the hierarchy; settings for each display are remembered, allowing you to easily jump between custom setups.

SUMMARY

This unit is constructed quite solidly within a milled aluminum case, and weighs in at about six pounds. It is perhaps a little heavy and fatiguing for prolonged handheld use, but if I had to trade off solid construction for a slight weight decrease, I would opt for the more solid construction. I didn't try the drop or bounce test, but I have a strong feeling this unit would survive quite a bit of rough handling or abuse. Still and all, a bit of rubberized handling grip would be welcome.

Analysis is quite accurate; in fact it's

more detailed than that provided by my current standalone waveform monitor/vectorscope. Rechargeable battery life is quite reasonable (and the unit operates just fine from an external AC power supply), and this is a good thing, as changing out replaceable batteries means removing four screws on the back of the unit—a time-consuming if not daunting task.

The display is quite crisp and in most conditions, easy to read, but there were

a couple of moments in several locations when I would liked to have been able to adjust the display to compensate for lighting conditions. There were also a couple of moments when I wished I'd had waveform, vector, or audio displays supered over the picture input.

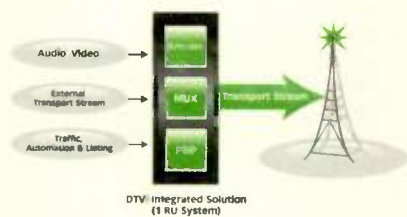
Aside from these small quibbles, the Flexiscope is a well-designed, highly functional and easy to use piece of test equipment. While the price is on the high side

for test/analysis equipment, the unit is built to last and will be useful long into the era of high definition. It should be of interest to operators in any remote ENG or EFP situation, or anywhere where space is at a premium.

Michael Hanish runs Free Lunch, a video/audio/multimedia production house near Guilford, Vt. He may be contacted at mhanish@sover.net.



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VISION + INNOVATION

LCD HD MONITOR

Panasonic BT-LH1700W HD Monitor

by Geoff Poister

Panasonic has introduced a line of affordably priced LCD high-definition broadcast monitors suitable for use during production or post-production. They currently come in three sizes: 8.4, 17 and 26 inches. The smallest is designed primarily as a camera monitor. This article examines the 17-inch unit, because it is a size that is convenient for both camera monitoring and postproduction.

All models are SD- and HD-compatible and have similar specifications. The advantage is that these LCD monitors are much more compact, lighter, less fragile and expensive than CRT versions, yet provide comparable image quality—delivering more than 16,700,000 display colors.

FEATURES

The Panasonic BT-LH1700W uses a liquid crystal display that has been engineered to meet broadcast specifications and applications. It has wide multiformat

image capability, supporting SD in NTSC and PAL, and virtually all HD formats: 1080i, 1080p and 720p in all possible frame rates. It also has all necessary input connections: two SDI inputs, com-

FAST FACTS

Application

Professional video picture/waveform monitoring

Key Features

Accommodates multiple video standards; split-screen with video freeze; wide viewing angle

List Price

\$3,400

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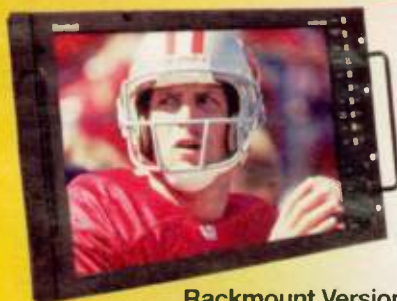
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Price: \$1999

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ponent, Y/C and composite. (The component input will also accept RGB signal compatible with a computer display.) And finally, it is also equipped with GPI and RS-232C terminals to provide external control. The native resolution is 1280x768.

Of course, it is image quality that is crucial for production and post-production monitoring. Here, Panasonic has focused on new technologies to meet or exceed broadcast standards. A new converter circuit transforms interlaced signals into progressive without any field length delay.

When receiving a video feed in professional broadcast applications, response time of intermediate gradations is a matter of concern. With this series of monitors, Panasonic has reduced response time to 8 ms, which is half the rate of its predecessors.

Diagonal lines from digital inputs are susceptible to geometric distortion. The BT-LH1700W employs a new method of diagonal interpolation that removes the stair-step effect that is sometimes seen in other monitors.

To ensure that the LCD performs to the same specifications as comparable CRTs, Panasonic has addressed two other areas of concern. First, gradation is compensated independently for red, green and blue channels across 256 steps to provide the correct gamma curve and color tracking. Second, the color range is matched to that of CRT standards by utilizing a color space conversion to closely approximate the chromatic gamut.

As a production monitor, the Panasonic BT-LH1700W has some very useful addi-

tional features. First, it provides a waveform monitor display that can be positioned in any corner of the screen. The monitor can also create a split-screen display. The left screen can freeze the frame to allow for matching the image of an additional camera, or for matching a live camera to a previously shot image. The monitor also provides frame markers for TV safe areas in both 4:3 and 16:9 aspect ratios. These features can be programmed into two user-defined buttons on the front panel, allowing users to select desired features instantly without having to go into the menu. Additional functions that can be assigned to the buttons include blue screen for calibrating to color bars, aspect ratio, and gamma control. The high-intensity LCD display provides a viewing angle of up to 176 degrees horizontally or vertically.

One feature that is refreshing in the digital age of menus and embedded functions is that the Panasonic BT-LH1700W has physical knobs and buttons right on the front panel for quick and tangible access to essential functions. For example, you select the input by pressing a clearly labeled button, and you're able to rotate physical knobs to adjust phase, chroma, brightness and contrast. Also, the monitor reminds you if the settings have been adjusted away from standard position by displaying a light above the knob.

Those of us who grew up with CRT monitors may have a slight aversion to replacing them with LCDs. Early LCD monitors lacked the brightness, color and contrast range that CRT monitors had. But technology truly has progressed, and Panasonic has engineered this monitor

Despite the advanced internal technology, Panasonic has preserved familiarity in operation. It is very easy to access the desired inputs on the back panel, and the front panel allows easy access to the most used functions, eliminating the need to enter the menu except to access advanced features.

I easily connected the monitor to several sources: a computer to view output from an Avid Media Composer, a DVD player and a DVCPRO HD deck. Switching between sources is as simple as pressing a button. And it's nice that every input has its own labeled button, rather than a single button that scrolls through the options. This monitor is straightforward.

I entered the menu to see what's there, and immediately decided to program the two function buttons on the front panel. I set one to "blue-only," because I like to calibrate often, and the other to waveform monitor, because I always want to know my exposure range when shooting or editing. Now, with the push of a button, I could enter these modes. There are other options that are useful in different situations. As examples, there are the split-screen and aspect ratio modes. Programming one of these buttons for aspect ratio allows you to quickly toggle between 16:9 and 4:3 when working with different source material.

I tested some of the monitor's other features, such as its ability to display a film-style gamma curve. It also has a setting specifically designed to display footage shot on a VariCam. As either of these settings departs from the standardized display the monitor is designed to deliver, a warning sign appears in the upper corner to let you know that you are seeing a display with a film gamma curve.

rial from the DVCPRO HD deck and the Avid Media Composer. I viewed 720p video transferred from film, and it faithfully captured the nuances of the original film. The monitor displays a wide contrast range, allowing you to see a broad gradient in darker areas, whether they are black or colored. The color rendition was faithful to the source material and equivalent to what one would expect from a CRT monitor.

This is an efficient, straightforward monitor that offers a number of distinct advantages. The LCD design makes it much lighter and more portable than a CRT monitor, yet it does not compromise image quality, resolution or color fidelity. It handles all popular HD and SD formats and this model is light enough to be used as either a production or post-production moni-

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

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TRIPOD HEAD

Manfrotto 503 Pro Video Fluid Head

by Carl Mrozek

The proliferation of small, lightweight DV camcorders has been instrumental in popularizing the MTV "shaky-cam" look. In my view, the scarcity of sturdy, lightweight tripods with truly professional fluid heads, in the early days of MiniDV may have been partly to blame for the co-evolution of the "shaky" aesthetic with MiniDV, despite onboard shake-free technology. However, what was embraced for squarish 4:3 MiniDV is not likely to be widely accepted for widescreen HD acquisition.

At this stage in its evolution, the HD viewing experience is more theatrical and demands a more classic shooting style—slow, smooth pans and tilts. These usually require pricey pro fluid head tripods.

Over time, tripod manufacturers have responded with various digital or DV series fluid heads and tripods, priced lower than those for 2/3-inch cameras,

but still not affordable for many pros struggling to upgrade to HDV.

True to form, Bogen-Manfrotto has set down new markers of affordability for pro HD quality fluid heads with their new 503 Pro Video Head that interfaces with most of their 75-mm ball tripods and is being packaged with some of those.

FEATURES

At 4.1-inches high, and 3.5 pounds, Manfrotto's 503 Pro Video Head is compact and portable. Its design is fairly basic, with a squareish camera base plate on top, about four inches on each side. The base plate is bisected by a slot, approximately two inches across, for the camera quick-release plate. Hence, the quick-release plate itself is 2-by-4-inches, and slightly broader on the bottom than on top—think of a pyramid decapitated close to its base.

When the camera's attached, this protruding edge enables the release plate to slide neatly and securely into the slot

in the fluid head's quick-release plate slot. As long as the camera is well secured to the release plate, the only way to detach it from the 503 head is to slide it backwards and release the safety catch. The beveled edge of the

knob located on the right



The Manfrotto 503,351MVB2K package, including the 503 pan and tilt head

quick-release plate and the safety catch help prevent the camera from accidentally detaching from the fluid head when carried around or bumped.

The quick-release sliding plate attaches to the base of the camera primarily by a 3/8-inch bolt, which is backed up by a smaller pin, fitting neatly into a machined hole on the camera's underside. The upper side of the quick release plate is rubberized to ensure a better grip on the camera's underside and to keep it from loosening and sliding around.

A small fastening knob on the right side of the base plate locks it in place, while a bright red plastic push button, protruding from the base plate on the opposite side, releases the safety pin which prevents the works from sliding off the 503 head in case the fastening knob is accidentally loosened.

The Manfrotto 503 head also features a nonadjustable spring counterbalance for use with cameras weighing up to 5.5 pounds. While the degree of counterbalance cannot be adjusted, the camera's center of gravity can be shifted backwards by sliding the quick-release plate backwards, with a travel of up to two inches.

The 503 video head also features an extendible handle, with a hard foam grip. The handle attaches to the upper rear corners of the 503 head by means of a furrowed circular grip with a threaded socket in the middle. This allows a handle to be attached to either or both sides. The handle provided telescopes from 15- to 25-inches. It can also rotate 360 degrees and can be firmly locked. There's a tilt-drag adjustment

side of the head, and the tilt lock is on the opposite side. Unlike some other fluid heads, the 503's tilt drag is continuously adjustable, rather than in discrete, numbered stages, and runs the gamut from quite slack to "nearly frozen," when using a 10- to 12-pound camera. Its tilt range extends from 90 degrees forward to 60 degrees backwards.

By contrast, the head can pan a full 360 degrees. The panning drag is also continuously adjustable, from quite slack to ultratight. The pan-lock knob is situated next to the leveling bubble, while the pan-drag adjustment knob is hidden from view underneath the head. The latter features an especially broad range of adjustment.

Manfrotto packages the 503 fluid head with three different tripods—the single-stage 3182 aluminum tripod, a newer two-stage aluminum tripod, the

FAST FACTS

Applications

ENG, EFP

Features

Light and sturdy, continuous drag adjustment, economical

Price

Tripod package 503,351MVB2K, list \$702; 503,351MVCFK, list \$1,562; 503,3182K, list \$991

Contact

Manfrotto
201-818-9500
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351MVB2; and a two-stage carbon fiber model, the 351MVCF. The 503 head and 3182 tripod, plus a midlevel spreader, tripod feet and bag are sold as the 503,3182K package, weighing 12 pounds and adjusts from 37- to 63-inches high. By substituting the 351MVB2 for the 3182, the package becomes the 503,351MVB2K, weighing 12.5 pounds with a height range of 20- to 63-inches. With the carbon fiber tripod, the package becomes the 503,351MVCFK, which weighs 11.7 pounds and has a height range of 20- to 63-inches.

MANFROTTO, PAGE 65

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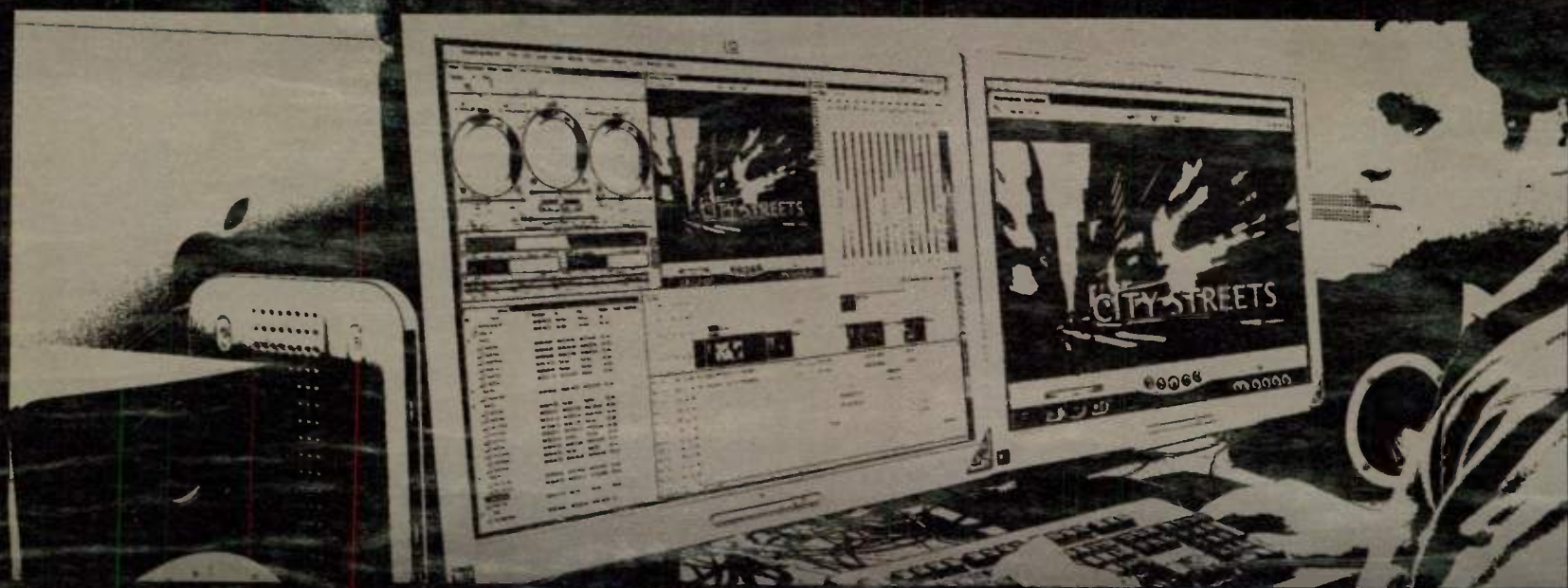
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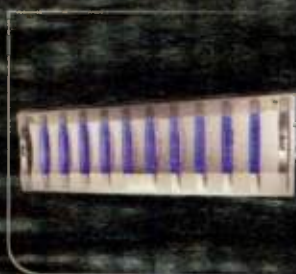
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CONTINUED FROM PAGE 58

IN USE

I tested the package with the 503 pro video head and the 3182 aluminum tripod and spreader. Attaching the quick-release plate to the Canon XL H1 camcorder was fairly quick and straightforward, requiring only a coin to tighten

the single threaded fastening screw. This was much easier than other quick-release plates I've used.

Manfrotto uses a second fastener—a pressure pin—which pokes into an unthreaded hole on the camera's underside and is held there by the torque of the single fastening screw. Rubber strips on the inside of the release plate further strengthen the bond between release plate and camera, reducing slippage in

normal use.

Mounting the camera with release plate attached to the 503 head did require a little practice, as it must slide into the beveled track of the base-plate adaptor. This wasn't problematic, just a matter of learning a new trick.

I usually clutch the camera strap whenever walking with a camera attached to a tripod. I did the same with the XL H1 on the 503 head, but was

able to relax a bit after observing how solidly camera and tripod were connected. This feeling of confidence came in handy when shooting man-burro marathons in the Colorado Rockies. I needed to change camera positions and angles fast and frequently to make the most of the limited opportunities to capture the action streaking past me and often had to trot with camera and tripod on my shoulder to get the shots I wanted.

I usually set the continuous drag adjustment between midpoint and max or pan-and-tilt. This helped me achieve smooth slow camera movement, particularly critical when panning vistas or tracking movement. While shooting, I could quickly adjust the drag according to the subject's speed and the desired effect. That's virtually impossible with a head having discrete drag levels, as there is usually a slight hesitation when shifting from one level to the next. With the continuous adjustment, I found it easier to find a sweet spot for really slow,

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yet fluid, pans and tilts with a setting well below maximum. This is something I've had difficulty doing on much pricier heads with calibrated drag levels.

I was also able to achieve buttery smooth tilts with the continuous drag adjustment, something that typically requires a high-end fluid head. Often it wasn't necessary to use maximum drag to achieve these slow and smooth tilts with the XL H1 camcorder on the 503 head. In shooting live concerts with a single camera, I used less drag to facilitate fast framing changes—some of them done while shooting. In reviewing the footage, I had great difficulty distinguishing where I changed drag in mid-shot. The spring counterbalance also helped with the smooth tilts and to keep the camera from drooping. The Canon XL H1 exceeds the 5.5 pounds limit of the fixed-spring counterbalances, but by sliding the quick-release plate backwards, I was able to offset the weight, at least while at rest. This allowed it to sit unlocked when not being handled.

MANFROTTO, PAGE 65



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Manfrotto

CONTINUED FROM PAGE 60

Moreover, I was able to comfortably move the tripod package and camera modest distances in this mode without fear of dumping the camera.

When mated with the Bogen/Manfrotto 3182 tripod, it provided the solid base needed for slow, dramatic pan-and-tilts required for quality HD productions.

Even though the 3182 is an older, slightly heavier tripod, the weight increased stability and facilitated fast setups, as I was able to use it without the

mid-level spreader. By slightly over-tightening the bolts connecting the legs to the ball base, I found a workable level of joint tightness that kept the legs from slipping outwards when placed on a sidewalk or similar surface.

I also found the plastic flip-locks handy for adjusting leg lengths quickly and easily—even blindly—during shooting. They locked securely but were eas-

ily unlocked and flipped up with only the touch of a finger, and re-locked just as easily. The leveling ball was also fairly reachable and adjustable, in spite of my fairly large hands. The ball also locked and unlocked easily, yet stayed locked most of the time. I say most of the time, as it did unlock by accident, but this was the result of my being in a hurry and only half-tightening it. Even so, the solidity of the 3182 tripod, with its double-clawed feet, prevented any serious harm to both camera and tripod.

SUMMARY

Manfrotto's 503 head handled impressively in the field, even in run-and-gun situations. It enabled me to get smooth slow pan and tilts and proved to be rugged and no worse for wear after plenty of knocking around in the field. When mated with the 3182 tripod, it provided the solid base needed for slow, dramatic pan-and-tilts required for qual-

ity HD productions.

For the price, the 503 under-promises and over-delivers, measuring up to Manfrotto's claim that it has the best price/performance ratio of any tripod on the market today. The package I tested is a no frills, but very professional, combo that delivers well on all key parameters and doesn't drive up costs with unneeded bells and whistles. With it and the two-stage 531.351MV2B aluminum package, most professional requirements can be met, including ENG and FFP HDV shooting. For shooters who carry their gear for hours at a time, the carbon fiber tripod 531.351MVCF package might be a wise investment. ■

Carl Mrozek operates Eagle Eye Media, based in Buffalo, N.Y., which specializes in wildlife and outdoor subjects. Contact him at eagleye@localnet.net.

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TV TECH BUSINESS

FCC Approves AT&T-Bellsouth Merger

WASHINGTON

Late last month, the FCC gave the go-ahead to AT&T's \$86 billion takeover of Bellsouth. The deal folds together the country's largest national and regional wireline phone companies as well as the largest cell outfit, Cingular Wireless. Cingular was a joint venture between the two entities before the merger.

Cingular has about 59 million cell subscribers, \$34 billion in revenue in 2005, and employed 70,000 people as of last year. Bellsouth reported \$20 billion in revenue in 2005 and employs about 63,000 people, while AT&T pulled in \$44 billion in 2005 and employs more than 300,000.

First announced last March, the proposed merger was attacked by consumer groups and antimonopolists. Just 15 months prior, SBC had swallowed AT&T for \$16 billion and renamed itself AT&T. In the preceding decade, SBC had been Southwestern Bell and which acquired Pacific Telesis and Ameritech upon making certain promises to the FCC. The combined companies became SBC.

To gain merger approval, the new AT&T has promised to bring 3,000 overseas jobs back to the United States; build broadband out in its entire territory by the end of 2007; offer 768 kbps of broadband for \$10 for a 30-month period within six months after the

merger closing date; and abide by some basic tenants of network neutrality for two years.

The FCC approved the merger with a vote of four ayes and one abstaining. Commissioner Robert McDowell, a former phone lobbyist, remained recused from the vote. The concessions, offered by AT&T on Dec. 28, were enough to sway the two Democrats on the commission.

AT&T's corporate headquarters will remain in San Antonio. The new AT&T Southeast (formerly Bellsouth) and Cingular will continue to be based in Atlanta.

New York Times Sells TV Stations

NEW YORK

The New York Times Co. confirmed its long-awaited exit from the television broadcasting business earlier this month, announcing that it is selling its Broadcast Media Group to Oak Hill Capital Partners, a private equity firm headed up by Robert M. Bass.

The deal, valued at \$575 million, includes nine stations, their associated Web sites and the Digital Operating Center and is expected to close in the first half of this year. The nine stations include WHO-TV, Des Moines, Iowa (NBC); KFSM-TV, Ft. Smith, Ark. (CBS); WHNT-TV, Huntsville, Ala. (CBS); WREG-TV, Memphis, Tenn. (CBS); WQAD-TV, Moline, Ill. (ABC); WTKR-TV, Norfolk, Va. (CBS); KFOR-TV, Oklahoma City, Okla. (NBC);

KAUT-TV, Oklahoma City, Okla. (MyNetworkTV), and WNEP-TV in Scranton, Pa. (ABC).

"These are strong, well-situated stations with very talented employees," said Janet L. Robinson, president and CEO of The New York Times Co. "Over the years they have provided their communities with high-quality programming and have contributed significantly to our financial performance. We believe, however, that our focus now should be on the development of our newspapers and our rapidly growing digital businesses and the increasing synergies between them."

IABM Issues Bullish Outlook

READING, U.K.

Broadcast and media technology suppliers in North America and Europe are experiencing 40 percent year-on-year profit growth, according to a quarterly index reported by the International Association of Broadcasting Manufacturers.

The organization represents broadcast and media technology suppliers and tracks financial data of about 50 private and public companies predominately from North America and Europe. It said European manufacturers had better return on sales than its North American counterparts over the period.

The companies it tracked represent more than \$6 billion of sales over the last year, the organization said. Companies

based in North America account for 58 percent of this figure and companies registered in Europe, 42 percent.

The group said that "overall the broadcast and media technology supply industry is experiencing a healthy 14 percent year-on-year sales increase. Growth rates in North America and Europe appear to be converging, with the former's growth rate one or two percentage points in the lead."

In other association news, Nigel Spratling was recently appointed the North American representative, a first step in expanding IABM's membership support efforts on the continent, according to the association.

Spratling is currently president of Mavens Television Industry Consultants and is based near Philadelphia.

LIN TV, Verizon Strike Deal

PROVIDENCE, R.I.

LIN TV Corp. recently inked a deal to allow Verizon to retransmit programming from its stations on Verizon's FiOS TV service.

The agreement allows Verizon to distribute LIN TV's locally produced content, including newscasts, in both analog and HD in LIN markets where FiOS service is available. The deal also gives Verizon permission to distribute LIN content as video-on-demand offerings.

LIN TV owns and operates 31 television stations in 18 U.S. markets and also in Puerto Rico.

The new service will be available first in the Norfolk, Va. area, with LIN's WAVY-TV and WVBTV being carried.

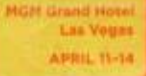
Tandberg Television Inks \$8M DirecTV Order

OSLO, NORWAY

Tandberg Television has received an order worth more than \$8 million from DirecTV for its second-generation MPEG-4 AVC HD EN8090 video compression system.

The contract is a continuation of DirecTV's deployment of HD content to local markets. The revenue is expected to be recognized in the fourth quarter of 2006 and the first quarter of 2007.

Tandberg Television offers digital TV solutions including IPTV, HDTV, on-demand services, and interactive TV applications to customers in the Americas, Asia Pacific, Europe, Middle East and Africa. The company is headquartered in the U.K. and has offices in Atlanta and Hong Kong.



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