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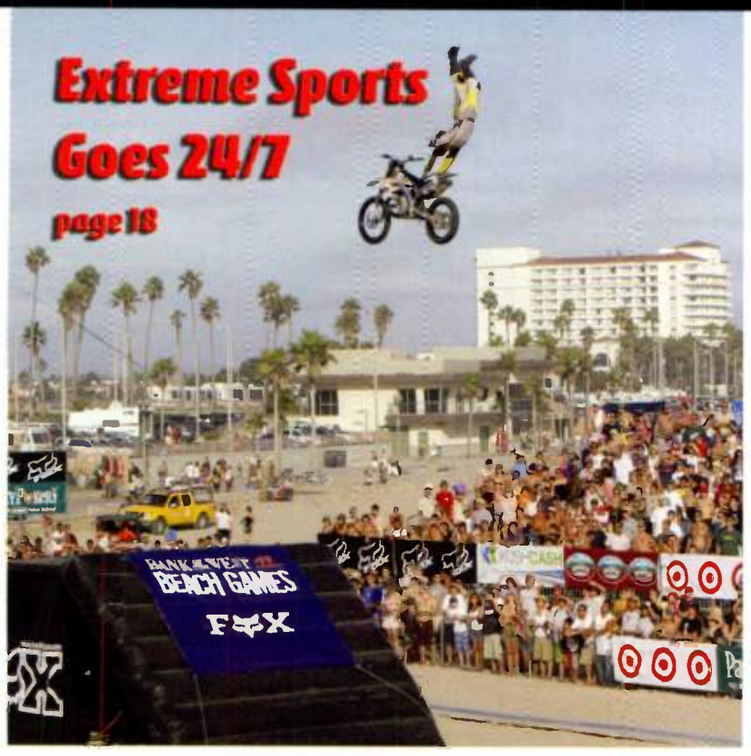
WWW.TVTECHNOLOGY.COM VOLUME 25, NO. 9 • APRIL 16, 2007

WHAT'S INSIDE



Stations Await A Final Answer

Uncertainties delay shutoff plans

by James E. O'Neal

Editor's note: In Part I of this two part series, **TV Technology** *reported on the ability of transmission equipment manufacturers to meet projected demands by the Feb. 17, 2009 deadline for the analog TV shutoff. In this second part, others involved in the digital shuffle offer their views.*

WASHINGTON

While equipment manufacturers are confident that they can deliver the required equipment, there are concerns that some stations still may not be able to make the deadline.

Doug Lung, **TV Technology** columnist and director of technology for a major station group, says it's not that easy for some stations, as they don't know with certainty what

STATIONS, PAGE 12

NAB2007 UPDATE • NAB2007 UPDATE • N

NAB Honors MSTV's Victor Tawil

Industry vet to receive NAB Engineering Achievement Award

by Claudia Kienzle

LAS VEGAS

At NAB2007 this week, Victor Tawil, senior vice president of the Association of Maximum Service Television (MSTV) will receive the 2007 NAB Engineering Achievement Award.

The award, to be presented at the NAB Technology Luncheon sponsored by Samsung on Wednesday, April 18, recognizes outstanding achievements and contributions in the broadcast engineering profession.

Prior to joining MSTV in 1987, Tawil worked for 14 years at the FCC in the Office of Science and Technology where he specialized in spectrum management, tropospheric propagation, and system engineering. He holds graduate degrees in electrical engineering and bio med from the University of Rochester and has expertise in RF spectrum management, broadcasting, satellite, wireless, and other new telecommunications services.

Founded 51 years ago, MSTV is a technical trade

TAWIL, PAGE 28

Victor Tawil, senior vice president of MSTV

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Don Jarvis, VP Engineering
Lifetime Entertainment Services

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IN THIS ISSUE

NEWS

FEATURES

EQUIPMENT REVIEWS

EQUIPMENT

NAB 2007 UPDATE

CONTRIBUTING WRITERS

Mark Turner

Count on IT

Are you a CTO? Is the title "CTO" printed on your business card? Do you have a business card? Regardless of your answer, if your job has anything to do with technology, then you may be a CTO. Technically speaking (pardon the pun), a CTO is a chief technical... p.32

Will Workman

Inside Broadband

It's a real treat to teach bright undergrads at one of the nation's finest public universities.
Here in Madison, Wis., the university is renowned for its Midwest academic excellence, top athletic programs in football, basketball... p 36

Frank Beacham

Net Soup

Iwas delighted to get word that my alma mater, the University of South Carolina, had finally made the top rankings of the nation's colleges and universities.
The RIAA, that collective of wizards who represent the world's commercial music industry, ranked... p.44

FROM THE TECHNOLOGY EDITOR

The Morning After

We've all had our share of reality checks on the road to digital television. Some of us have waited longer than others to get in step and march to the digital cadence, but with a little effort, it looks as if everyone will be ready on that February morning in 2009 when we look longingly over at the cold analog transmitter and realize that it won't be turned on any more.

A few things are givens that day. The telephone will ring incessantly with calls from (former) viewers who aren't receiving a signal any more. The CFO will be in a much better frame of mind, now that the power bill is going to drop and the station can really start seeing a return on its very substantial digital investment.

But one thing will be a bit more subtle.

At many stations tons and tons of transmitters (and perhaps antennas and even towers) are going to be just that much dead weight.

It's a fair guess that many engineers have been too busy taking care of digital and high-definition upgrades to really face the issue of what to do with their defunct analog main and auxiliary transmitters, associated power supplies, heat exchangers, monitoring equipment and more, none of which will be needed once that big switch is pulled for the last time. Some stations are also going to have to deal with useless antennas and maybe an older tower.

The majority of this transmitting equipment will probably have quite a bit of life left, as broadcasters have been conscientious about replacing older energy hogs and rigs no longer supported by manufacturers. However, with the shift to digital and the move to UHF, selling unneeded gear to smaller stations isn't likely to be an option this time.

One way of dealing with these large trappings of a bygone era in television is to just "abandon in place," as government jargon describes the process of writing something off and forgetting it's there. Let someone else worry about it! Sure, a lot of transmitter plants are remotely located, and "out-of-sight, out-of-mind" is a plan requiring minimal effort. However, the piper is going to have to be paid eventually.

Some time ago, a friend recounted to me his visit to an electrical generating plant in an area where mining was once big business. Several decades earlier he had toured the plant and was impressed by a gigantic 60 Hz to 20 Hz rotary converter installed to accommodate mining equipment. With the passage of time, 20 Hz power demand dropped and the utility needed extra space. Unfortunately, the behemoth mechanical device had been boxed in by expansions and couldn't be just unbolted and put on dollies. The only solution was to chop tons of converter into small pieces—a very costly, involved and messy process.

There's a similar story associated with a very large 1930s radio transmitter. Years after it was last on the air, oil in a basement modulation transformer was found to be over the limit for PCBs. Tons of transformer had to be removed, necessitating special rigging and the disassembly and removal of a lot of other gear. The operation did not come cheap.

Perhaps the disposal headache shouldn't be left for the next generation of engineering people.

The same goes for unused antennas and unused towers. They'll have to come down eventually, and buying time with long-term maintenance is not exactly cheap either.

If copper prices continue to rise or even hold steady, then the spring of 2009 would be a good time to take down some no-longer-needed transmission line.

Some of the really classic transmitters should be preserved in museums. The rest, unfortunately, will likely find their way to landfills and recycling centers.

Many people in the industry have been kept busy moving everyone over to digital. Perhaps there's another post-analog business opportunity that will come into being—a removal and disposal service for transmitters and antennas!

James O'Neal
Technology Editor
joneal@imaspub.com

LETTERS

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

You're Both Right

Dear Editor:

In response to Frank Beacham's Net Soup column ("Corporations Co-opt Citizen Journalism," Feb. 7) and Harlan Neugeboren's Newsroom Technology column ("The Customer is Always Right, Feb. 7), you are both right.

The stuff I have seen that was shot by amateurs would hardly make it on to my programs, and I'm certainly not a large market. Frank, you are right… they are not going to replace professionals.

However, Harlan is also right. Either we change or we disappear. That sentence about NY1 is on target. Maybe all news should be managed that way. Get the professionals out of the studio and on the street.

Jerry Jones
Mid America Productions
Hot Springs, Ark.

Sorry I Asked

Dear Mr. Butts:

Regarding your editorial in March 7 issue of TV Technology ("The White Space Debate"), I am compelled to ask: If it is such a great idea to allow unlicensed devices in the television broadcast band, why is it not an equally good idea to allow unlicensed devices in those portions of the spectrum that are set aside exclusively for government use?

I imagine, in my mind's eye, two reply comments from the FCC: 1) The FCC does not have authority over this spectrum, therefore cannot allocate it, and 2) Don't be silly.

Yes, my point exactly.

Tom Norman, CPBE
Centennial, Colo.

TV TECHNOLOGY

Vol 25 No 9 April 16, 2007

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TV Technology (ISSN: 0887-1701) is published su additional issues in April and May by IMAS Publi 5827 Columbia Pike, Third Floor, Falls Church VA 22 703-998-7600. FAX 703-998-2966. The inter lished monthly along with the month's secon Periodicals postage paid at Falls Church VA 22046 mailing offices. POSTMASTER: Send address ch Technology, P.O. Box 1214, Falls Church VA 2204 by IMAS Publishing (USA) Inc. All rights reserved. Re tact the author and TV Technology.

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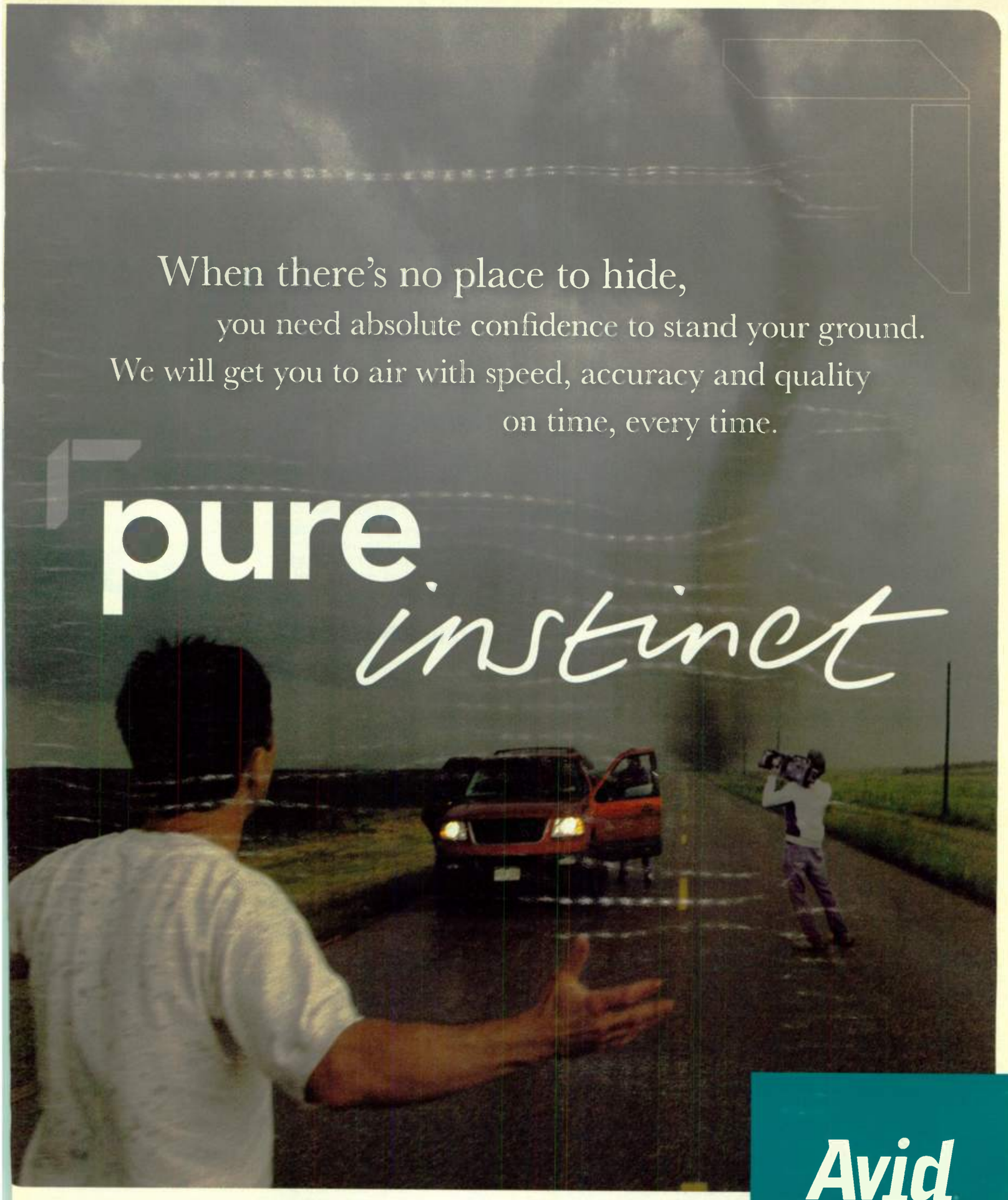

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'NBC Nightly News' Makes HD Debut

NEW YORK

NBC began airing the "NBC Nightly News with Brian Williams" in 1080i high definition on March 26.

The launch was conducted with a minimum of fanfare, merely flagging the new era with a quick lower-screen graphic at the beginning of the program. Anchorman Williams only mentioned the event in passing near the end of the show, reflecting on the 1965 jump to color of The Huntley-Brinkley newscast, and suggested that the HD transition was not as momentous.

Both NBC and ABC air their morning news and features in high definition; however, the March 26 broadcast marks the first time a traditional network half-hour news has gone HD.

In the studio, NBC uses the Sony HDC-1500 HD camera, but at present, most field reports will continue to be captured in standard definition and upconverted to match the studio video, and with the amount of contribution material being captured by even cell phone cameras, it is unlikely that the program's entire content will be entirely HD in the near future.

An NBC New York video control room

HD News

HD News

Verizon's FiOS Goes 'Hyperlocal'

WASHINGTON

Verizon has launched FiOS1, a channel that will provide local weather, traffic, news, sports and community features to FiOS TV subscribers in Northern Virginia and parts of Maryland.

FiOS1 is Verizon's first owned and operated television channel and is available on Channel 1 in the FiOS TV lineup. An example of the FiOS1 local programming includes a new program called "Push-Pause," a Verizon original production in collaboration with HyperLocal News Productions. Push-Pause features hyperlocal news and community stories shot by locally trained citizen video journalists.

Michael Rosenblum, head of HyperLocal News Productions said the goal of hyperlocal is to "broadcast stories that average people really are concerned about."

Rosenblum, who built New York's 24-hour news network NY1, trains the citizen video journalists on the latest digital camcorders. FiOS1 currently has five citizen video journalists working in the Washington D.C. area, and it also plans to invite viewers to submit their own local community stories to include in the program.

Verizon spokesperson Sharon Cohen-Hagar said, "FiOS1 will not only have information and features about the Washington metro area, it will have information about the communities in the region."

Michelle Webb, executive prtoducer and general manager of FiOS1, and a former ABC news producer, said the plan is to have traffic, weather and news in the morning followed by Push-Pause and then sports in the evening.

FiOS TV has formed a partnership with WUSA9, the Gannett-owned local CBS affiliate, to create the news content. FiOS1 will feature 20 hours of sports programming a week, including college and high school games, as well as professional baseball games. Verizon has partnered with Georgetown University Athletics and George Mason University to cover its sporting events.

Verizon said it will launch similar channels in other markets this year, but would not specify which ones. FiOS TV is also available in California, Delaware Florida, Maryland, Massachusetts, New Jersey, New York, Pennsylvania, Texas and Virginia. According to the company, there are about 207,000 FiOS TV customers with service available to 2.4 million households.

In Washington, FiOS is available in the Maryland counties of Anne Arundel, Howard, Prince Georges and Montgomery, plus the towns/cities of Annapolis, Laurel, and Bowie. Virginia counties include Arlington, Fairfax, Loudon and Prince William, as well as the cities of Leesburg, Dumfries, Herndon and Falls Church

IPTV

IPTV

NFL to Allow Local Sideline Coverage

WASHINGTON

During league meetings last month, the National Football League agreed to allow local TV stations to cover NFL games from the sidelines.

The change alters a previous rule that was adopted in March 2006 that banned local station video cameras from the sidelines during games. The new rules will allow up to 10 video crews, five from the local market of each competing team, to cover games from the field. Participating stations would be expected to provide pool coverage, with details to be worked out between the teams and the local stations that cover them.

The Radio and Television News Directors Association has led opposition to the original rule, claiming that it discriminated against television journalists and impeded the media's right to gather and disseminate public information. During the 2006 season, teams permitted local stations to deploy one pool crew per team at each game. Legislation to assure access to games in publicly funded stadiums has been introduced in state legislatures in Michigan, Missouri and Arizona.

RTNDA President Barbara Cochran applauded the decision.

"This change represents a major improvement over last season's restrictions," said RTNDA Barbara Cochran. "Now local television stations will be in a better position to provide fans with excellent game coverage."

Sports

Sports

Arctic Film Shot with AG-HVX200

SECAUCUS, N.J.

Filmmaker Art Howard recently shot a documentary project supporting the ongoing International Polar Year (IPY) with a Panasonic AG-HVX200 DVCPRO HD P2 camcorder.

Howard spent a month aboard a Russian icebreaker in Arctic waters, documenting the work of scientists studying climate change and its effect on the thickness of ice there. Sponsor of the documentary is the North Carolina Museum of Natural Sciences, which is planning to use the 15-minute production as a theatre presentation on the IPY.

Filmmaker Art Howard stands outside the Russian icebreaker Dranichin with his Panasonic AG-HVX200 camcorder.

Howard used the AG-HVX200 camera exclusively for capturing scenes in the documentary.

"The HVX200 was a great choice for the icebreaker project," Howard said. "I needed quality in a small package. I was working by myself, and weight and flexibility were issues. I like how light the camera is and how mobile I can stay. I love to work close to people, and the camera is not intimidating.

Howard explained that he needed to be able to shoot in confined spaces within the icebreaker and that he also had to go back and forth between extremes of temperature and humidity when he moved to outside shots.

"The camera was subjected to extreme cold temperatures, blowing ice and snow, and it never failed," he said. "The performance of the HVX200 was even better than I'd expected in terms of the cold and its ruggedness. I stayed outside for hours at a time in the harshest conditions, and the camera didn't blink. A shooter on-site for another organization had a tape-based camera, and even with a cover it had head and humidity issues."

Howard shot in 1080i, using two 4 GB and one 8 GB P2 storage cards, then transferred the P2 files onto external hard drives. He used the HVX200 in 720pN mode for maximizing time during interview shooting.

Documentary

Documentary

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Public TV Links With Public Safety

First phase of the Digital Emergency Alert System launches June 1

by Sanjay Talwani

WASHINGTON

While various industry players jockey for spectrum made available by the DTV transition, public TV stations are contributing more and more of their own resources to the nation's public safety communications infrastructure.

A handful of pioneering DTV programs across the country are linking local public safety offices to information from training modules to scheduling programs and routine data to live video. And DEAS (the Digital Emergency Alert System) is expected to have its first phase to be running across some 53 public television stations in the nation's hurricane belt by June 1.

"We're building a backbone of an alert and response system that could be built out with a wide range of state and local capabilities," said John Lawson, president and CEO of the Association of Public Television Stations.

Launched in 2006, DEAS gives FEMA an avenue into PBS' satellite feed, so that a message may be sent to selected channels as well as to the states' emergency operations centers. States can then deal with the info as they see fit, likely triggering the traditional analog EAS across all channels. SpectraRep Inc., based in Chantilly, Va., is providing systems integration and project management services for DEAS.

GROWING PAINS

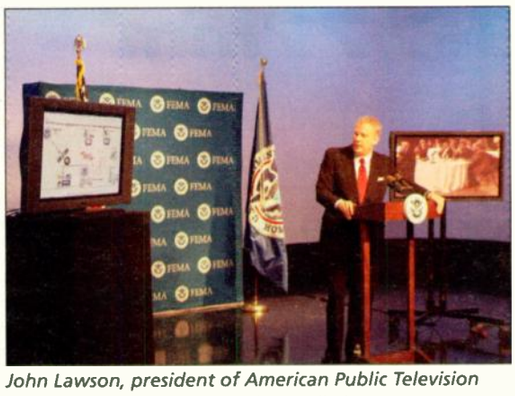
Meanwhile, funding remains a central issue for several local communities, seeking to unite their far-flung public safety agencies with a single emergency information source.

In Rochester, N.Y., the ETIN (Emergency Training and Information Network) has receivers in more than 100 locations, with six channels (police, fire, etc.) operating. Lt. Dan Bender of the Rochester Fire Department, who conceived much of the system and provides it with content, says the system, using a SkyScraper datacasting system from Princeton, N.J.-based Triveni Digital at public station WXXI, is up and running and used every day, although some bugs—mostly now ironed out—have accompanied the rollout.

Among the lessons learned: Likening the system to a tree that grew a bit fast for its roots. Bender said the initial implementation involved many receivers and locations—more than 100.

"We tried to get too many sites in under the initial grant," Bender said. "We had to skimp on hardware and now we're revisiting that."

Looking ahead, Bender notes that his region still has hundreds of sites that ought to be tied into the system.



John Lawson, president of American Public Television Stations, unveiled DEAS to the media last summer.

He's planning a major demonstration, involving local congressmen and local media, to turn them on to the system and to show the Department of Homeland Security what he did with their grant money.

"Funding is always the biggest obstacle with technology that I've found," he said.

Bender is also using third-party applications; one local company, Pictometry, provides mapping data that satellite imagery can be integrated with the system. He's also exploring mobile wireless applications for the system to reach vehicles.

He's enlisted some of the local agencies as "subscribers," paying for the content—putting the heat on Bender to keep his content worthwhile.

Kent Hatfield, vice president of technology and operations at WXXI, said he uses a Terayon DM6400 CherryPicker muxer and the Triveni to get efficient signals and flexibility across various bit-rates. Reception problems—namely receivers crashing from the datacasting signal—were due to receivers that were not ATSC-compliant, he said.

Now, he said, other cities are coming to Rochester to see how to adapt the model to their own needs.

Hatfield compares the process to "inventing the wheel."

"Our goal was to invent a framework which could be rapidly deployed, and we've done that," he said.

The staff at KPBS in San Diego visited Rochester and are now also using the Triveni SkyScraper Emergency Services Network in a multi-agency project with the San Diego Police Department—to deliver training and emergency information to the various agencies in that vast metropolis in a new Regional Emergency Services Network. Features include capability for live video feeds from a helicopter.

Officer Sandi Lehan, SDPD special projects manager said the setup will include portable "suitcases" of receiving gear so that outside agencies that come in during a major event—say, out-of-area firefighters, or the Red Cross—can also be in the loop on the DTV-driven information.

Lehan said that in the Cedar Fires of 2003, mobile phone networks were

SAFETY, PAGE 10

Cyren Call Says Broadcasters Shouldn't Worry

WASHINGTON

Morgan O'Brien, the founder of Nextel, has a vision for a futuristic, nationwide public safety and commercial broadband network on the spectrum to be vacated by broadcasters at the end of the digital transition in February 2009.

O'Brien and his new company, Cyren Call Communications Corp., see a state-of-the-art system with near-universal coverage, reliability, and interoperability among its various users.

Along with the new technology, O'Brien is pitching a new business model, a hybrid commercial and public safety system in which commercial operators would build out the network to the superior standards under licensing by the public safety community, as empanelled in a new Public Safety Broadband Trust.

The dream, which has the backing of major public safety organizations, would apparently require new legislation to assign 30 MHz (of the 60 MHz now slated for auction) to the PSBT, which would in turn license the spectrum out to commercial users—not necessarily Cyren Call—who would build the new according to the standards of the PSBT.

But critics—especially those who would use that spectrum for their own commercial enterprise—aren't buying it.

The wireless industry and an economic study commissioned by the Consumer Electronics Association and the DTV Alliance say the Cyren Call plan could upend the carefully constructed compromises around the DTV transition. Under current law, some of the funds expected from the auction of broadcasters' vacated spectrum is already pegged to deficit reduction, public safety interoperability grants and the DTV converter box subsidy.

Jeff Eisenbach, CEO of Washington-based Criterion Economics, which wrote the CEA/DTV Alliance study, said he can't imagine putting all the those legislative apples back on the cart if it's upended.

The plan's critics also say the 24 MHz in the 700 MHz range that is already slated by Congress for public safety and interoperability is plenty for that purpose, an assessment Cyren Call and its allied police and fire organizations strongly dispute.

The PSBT would ultimately find $5 billion to pay the government for the 30 MHz. The Congressional Research Service has estimated the take for the entire 60 MHz could be $10 billion to $15 billion, so budget watchdogs and others have charged that the Treasury—and the programs relying on the auction proceeds—could be shortchanged.

Cyren Call disagrees and notes that it's the wireless companies, not broadcasters, mainly fighting this fight. "It's an argument trumped up by commercial wireless so they can stop us from having some of that additional spectrum made available to public safety," O'Brien told **TV Technology**. "We haven't heard a peep out of anybody else."

Critics also say the plan anticipates wireless companies and their customers are willing to pay a premium for the extra reliability and near-universal coverage demanded by the pubic-safety community.

Cyren Call says the network's special features demanded by police and firefighters should not be viewed as a burden. "There's a great opportunity to build a very robust network that has the highest quality, the highest level of availability, the highest coverage," said O'Brien. And it goes beyond that, he said, to others with high-end needs, such as utilities and hospitals, and more users who also demand the network's features.

The company initially proposed its plan to the FCC as it took comment on interoperability and public-safety uses of the 24 MHz Congress set aside for that purpose. The FCC rejected the Cyren Call proposal as being far outside its authority. Cyren Call has rebutted the FCC decision, but has also taken its case to Congress to try to change the law, and has circulated proposed legislation among lawmakers of both parties.

Sen. John McCain (R-Ariz.) has taken many of the elements of the Cyren Call plan in draft legislation that "goes to the precipice" of establishing the PSBT trust as envisioned by Cyren Call, according to O'Brien. But the McCain draft stops short and instead would auction the spectrum off with certain public safety encumbrances. Cyren Call doesn't support that plan, saying the proposal fails to give enough control of the buildout and operation to the public safety community.

Sanjay Talwani

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A Plan for Orphaned Transmitters?

Broadcasters face another 'weighty' DTV transition problem

by James E. O'Neal

FALLS CHURCH, VA.

After the official Feb. 17, 2009 analog shutoff, are there any large scale plans to deal with the transmitters that are no longer needed?

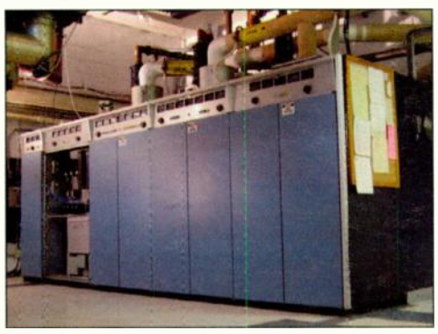
Virtually all stations are providing analog and digital services until the cutoff, and this has meant the installation of additional transmitters and antennas, transmission lines, power distribution and other equipment. While some broadcasters have added sidemount antennas or gone to dual-channel models, others were faced with towers that couldn't support additional loading and new sticks have had to be erected.

At last check, there were more than 1,750 full-power stations in operation and it's a good bet that many of these have at least one transmitter that can't be put on the air after the last analog sign-off. (In some cases there may even be more analog remainders at transmitter sites—backup transmitters, and even redundant towers and antennas.

A check of several transmitter manufacturers indicated that none really had any sort of buyback or retroactive trade-in programs.

Jay Adrick, vice president of broadcast technology at Harris Corp., offered some figures and scenarios on the post-2/17 transmitter situation.

"We have 306 television stations currently broadcasting in UHF that have elected, or have been designated, to move back to their [analog] VHF channel assignment," Adrick said. "These stations own both U and V transmitters and will need to come up with a digital VHF transmitter. It's Harris' understanding that 25 to 40 percent of these analog VHF transmitters could be repurposed for digital. Our newer Harris Platinum [analog] transmitters can be converted to digital, but this is not a simple overnight conversion."



An RCA TTU-60 transmitter from the 1960s—one of many destined for landfills or recyclers.

CUTTING IT IN HALF

Adrick said that some Harris customers have asked about literally "cutting their transmitters in half," to allow analog VHF transmissions to continue while the "amputated" half is converted to digital off-line. The idea is to have a digital-capable transmitter waiting in reserve for the morning of Feb. 18. Later, then-idle analog sides could be refitted for digital.

"On transition night, the station engineers would just throw a patch for digital V capability," Adrick said. "Post-transition, the remaining half of the transmitter could be converted to digital and become a redundant transmitter."

While addressing the issue of what to do with the older analog VHF transmitter, Adrick admits that this fix does not address disposal of the newer UHF transmitter, which, pretransition, had been carrying the station's digital schedule.

Another group of stations operating on different interim frequency assignment will move to a permanent "in core" assignment on moving day.

"In almost every case, there will not be the issue of replacing the transmitter, but just replacing components such as the output mask filter and amplifier combiners," Adrick said. "These transmitters will live on."

Richard Schwartz, vice president of marketing and management at Axcera believes it's a fair bet that stations broadcasting DTV on an interim UHF assignment will have a disposal problem on their hands.

"I think that any U that is going back to V will have a used transmitter to deal with," Schwartz said. "There's not going to be a big market for used transmitters. We're not making any offers."

He added that some stations have purchased analog transmitters from his company with the intent of converting them to digital when the time came.

"We've converted a fair number of our units, but these were purchased with the intent of converting at a later date," Schwartz said. "Some customers purchased full-power analog and digital transmitters and will have us retrofit the analog as a backup to the digital side. With our transmitters, the analog and digital models are pretty much the same."

Schwartz said that his company would do what it could to help customers dispose of unneeded equipment.

"If they have one of our transmitters, we'll keep an eye out for someone who might be in the market for a used transmitter among our customer base," Schwartz said. "If we can match them up, we will."

Brett Jenkins, U.S. video transmission product line manager for Grass Valley, said that for any manufacturer to offer a trade-in or buyback program there has to be a demand for the older technology.

"We do not have a program in place at this point," he said. "It's certainly something that has been discussed internally. However, there has to be a market for manufacturers to offer a buyback program.

"The industry is still trying to sort out the market for these used transmitters—some customers have been nursing old transmitters that probably shouldn't be on the air anymore," Jenkins said. "A lot of these probably will be retired."

Jenkins expects that once the transition is closer there would be some shuffling of transmitters within group-owned stations, but believed that this would not be a complete answer.

"Yes, we do believe that there will be a large amount of used transmitters on the market," Jenkins said. "The question remains on how they can be repurposed."

Eddy Vanderkerken is director of sales and marketing of broadcast products at Rohde & Schwarz and says that probably isn't much of a market for retired transmitters.

"In the last few years the efficiencies have gone up very much and the footprints have gotten smaller," he said. "There's also SNMP Web control—these are the things that today's buyers want. I'm not sure who would be interested in older technology anymore."

Radio stations have no digital mandate, but many have going digital. A fair number of existing transmitters weren't suitable for passing the new signals and have had to be replaced.

Paul Jellison, regional vice president of engineering at Clear Channel Communications oversees operations at WLW and other radio stations in the Cincinnati market. Some transmitters replaced at his company's stations have proven very difficult to remove due to later building renovations. However, he is not a fan of leaving a problem for someone else to solve later, especially regarding older transmitters that may contain PCB-bearing components.

"The rules are pretty clear about PCBs—you can keep transmitters with PCB-bearing transformers or other devices as long as they are in service [and] are not leaking," Jellison said. "A transformer's oil could be 100 percent PCB, and so long as it is in good repair and in service, it's OK."

The rule changes when a piece of contaminated equipment is taken out of service.

"Our 500 kW WLW transmitter was not in service and we were stuck with a disposal problem," he said. "The rule

TRANSMITTERS, PAGE 20

Safety

CONTINUED FROM PAGE 8

overwhelmed, so the reliability and penetration of the DTV signal became clear as a major asset.

MAKING HEADWAY

Triveni has more projects in the works in various cities. Out west, for example, the Utah Education Network (UEN) is installing Sky Scraper to datacast educational media for its Youth In Custody program, helping teachers of about 1,200 youth at 13 facilities across the state.

Ralph Bachoven, director of product management and marketing at Triveni said he's making headway in expanding SkyScraper technology to mobile applications.

"People would like to have all this information in their squad cars, fire trucks and so forth," he said. 8-VSB is not the best environment for mobile, he said, but often the "mobile" users are in vehicles parked still at emergency sites. Also, he said, Triveni's algorithms are optimized to allow the smooth resumption of downloads that get interrupted.

He said other trials in are underway in different cities to prove the usefulness of the DTV signal as a pillar of emergency response.

"When Hurricane Katrina went through the New Orleans area, the PBS stations were up and running," he said. "If you want to have, in the case of an emergency, a reliable network, I think DTV/PBS are a great network to utilize, and that network is in place today."

Lawson says efforts are underway in Washington to enable broadcasters to do more in public safety. Among other things, under provisions of the Warning Alert and Response Network (WARN) Act, the FCC has established a committee to help enable users of any device, including mobile phones, to receive emergency information.

A grant program associated with this cause was stripped out of the bill before passage, but Lawson said public broadcasters are circulating draft legislation informally called "WARN 2" to take care of some more issues, including funding. ■

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Stations

CONTINUED FROM PAGE 1

life will be like after Feb. 17, 2009.

"It's very difficult to order equipment without knowing what your post 2009 authorized facility will be," Lung said. "Right now a number of stations are limited by antenna patterns or ERP in order to protect analog stations that won't be there after 2009. It's very important for the FCC to get a filing window in place for facility maximization.

"Right now there's still a freeze on applications. You don't want to order a customized antenna, and then two days before the transition the FCC gives you authority to operate non-directionally. Stations don't want to have to rebuild a new DTV facility."

FIELD WORK

Even if equipment is identified and ordered in a timely manner, there could be problems in installing it.

Brett Jenkins, U.S. video transmission product line manager for Grass Valley, is confident that his company has the production capacity to crank out the necessary digital transmitters and the manpower to get them installed, but expressed concern that this may not be a universal situation.

"In connection with RF systems involved, there's going to be a lot of field work that has to be done," Jenkins said. "I think that this is where the industry is hurting. There's a shortage of skilled RF and antenna people. Broadcast engineers aren't that focused on RF issues anymore—other concerns have been getting their attention. There's been a decline in really knowledgeable high-power RF engineers."

"There's a shortage of skilled RF and antenna people. There's been a decline in really knowledgeable high-power RF engineers."
—Brett Jenkins, Grass Valley

Brett Jenkins, U.S. video transmission product line manager at Grass Valley

If a new tower is needed, Quentin Ellis, director of business development at United States Tower Services, wants customers to be aware that television towers don't happen overnight. Plans, permits, foundation work, staging of heavy machinery and erection crews and delivery of materials all take time.

"We can put up the steel work for a 1,000-foot tower in a week or two," Ellis said. "However when you figure in everything else, you're looking at about six months start to finish."

ENGINEERS SPEAK OUT

Just getting a digital signal on the air doesn't necessarily mean that a station's job is done.

"You have to recognize that a certain percentage of viewers watch your programming via cable or satellite," said Joey Gill, chief engineer of WSPD-TV in Paducah, Ky. "You have to make sure that they are ready too."

Gill reported that a majority of area cable systems could receive the station's digital signal.

"It's good to know that if we turned off our analog transmitter tomorrow, 70 percent of the cable customers could receive us," Gill said. "However, you also have to remember that 30 percent couldn't."

Gill is especially concerned about the readiness of the satellite delivery companies for "D-Day."

"The satellite people are still receiving our analog signal," Gill said. "If we turned off our analog transmitter tomorrow, then the satellite-delivered local service around here goes dark."

This doesn't seem to be an issue in other parts of the country, however.

"DirecTV is certainly taking our digital signal," said Dale Cassidy, chief engineer at KTBS-TV in Shreveport, La. "They've been carrying it for about a year and a half. We've just reached agreements with Dish Network."

Cassidy's station has been transmitting digitally for about four and a half years and he feels that other area stations were probably ready for the transition.

"In our market, almost everyone is already operating DTV—right now it's just whether or not everyone is HD-capable," he said. "Cost-wise, it would be great to turn the analog transmitter off now, but we don't have any plans to flash cut before the deadline."

Cable is not really an issue either. Cassidy says that some 20 cable companies carry KTBS-TV and estimates that nearly all are using the station's digital signal.

He's also gratified by viewer interest in receiving off-air television service.

"People are certainly putting up antennas," he said. "There are a lot of people without cable in rural areas, but who have access to our off-air signal. We're working with that part of the audience who want information about putting up an antenna for our digital service."

Cassidy said that his station is operating digitally with full power—1,000,000 watts ERP. Reception reports are coming in from as far away as 100 miles.

Ted Teffner has been involved in the digital transition at WCAX-TV in Burlington, Vt. since it began. He retired last December as the station's vice president of engineering, but is staying on as a consultant to see the conversion through.

"The transition is my life, and has been for the last 12 years," Teffner said.

WCAX's path to digital has not been especially smooth, and there's still much work to do before he can just walk away from the transmitter building with a smile on his face.

"Right now we're digital on Channel 53," Teffner said. "However, 53 is out of core and we're going to have to relocate to Channel 22. A lot of the RF work is going to have to be done over."

Teffner said that WCAX's transition was delayed by the transmitter's proximity to Canada.

"If you're within 400 km of the border, there has to be Canadian coordination," Teffner said. "When the FCC did the allotment table, they assumed that we would go back to our analog assignment—Channel 3—with digital. However, no one told the Canadians about this and they made a Channel 4 assignment. It took a long time to find another channel."

The WCAX-TV transmitter site is located on a 4,000-foot mountain and there's limited access during the colder months.

"The road turns into a ski trail," Teffner said. "Full access is only possible between Memorial Day and Columbus Day. We have to have everything in place by mid-October."

Teffner is confident that his facility will be ready for the transition, but says it will be a push.

"There's a pile of work to get done," he said. "It's going to be a complex process to get all of this together."

CHANNEL SWAPPING

Teffner's station is but one example where last-minute frequency swapping must be done to get everyone to permanent assignments. But for now, Teffner really can't do much more than lay the groundwork due to interference issues.

He's not alone, as more than 300 stations now transmitting DTV on UHF frequencies have elected to move back to VHF assignments. Also, more than 200 are currently operating on interim VHF or UHF channels (some of them out of core) and will be settling in on a permanent UHF assignment on moving day.

The moves are driven by interference concerns—before one station can move, another must first give up its channel and before the second station can vacate, someone else has to give up a berth.

Doug Lung feels that this flip-flopping of channels may be a particularly difficult hurdle to clear.

"The big issue is about stations moving to other channels—that's going to be quite a juggling act," Lung said. "The FCC's going to have to be flexible here—they said they would grant some flexibility, but have not haven t been precise on exactly how much."

"The transition is my life, and has been for the last 12 years."
—Ted Teffner, WCAX-TV

MSTV chief David Donovan acknowledges that this is a problematic area, but says it shouldn't be a showstopper.

"In seven DMAs we know about, there are between 10 and 14 stations moving channels," Donovan said. "Obviously for those, coordination will be paramount. On the other hand, there are 32 DMAs where no changing of channels is necessary—these should be quite smooth."

He said it's vital that broadcasters facing facility-swap situations start discussions with each other as soon as possible.

"The tragedy would be that a broadcaster that has built his facility with all requirements and is unable to go forward because some one else hasn't been diligent."

REPRIEVE?

In light of all that remains to make this a fully digital television nation, could the Feb. 17, 2009 deadline slip?

According to an FCC spokesperson, the official position is that the date is for keeps, as it was congressionally mandated.

And Dennis Wharton, vice president of corporate communications at NAB doesn't believe there will be any backpeddling.

"I think that the likelihood of an extension is very slim," Wharton said. "It's tied to public safety issues—some of the U channels will be given to the public safety people. There might be a small handful of stations that will have to go off the air. Even though we want it to be perfectly smooth, there's certainly going to be some bumps in the road by 2009, but this is a date that we're committed to." ■

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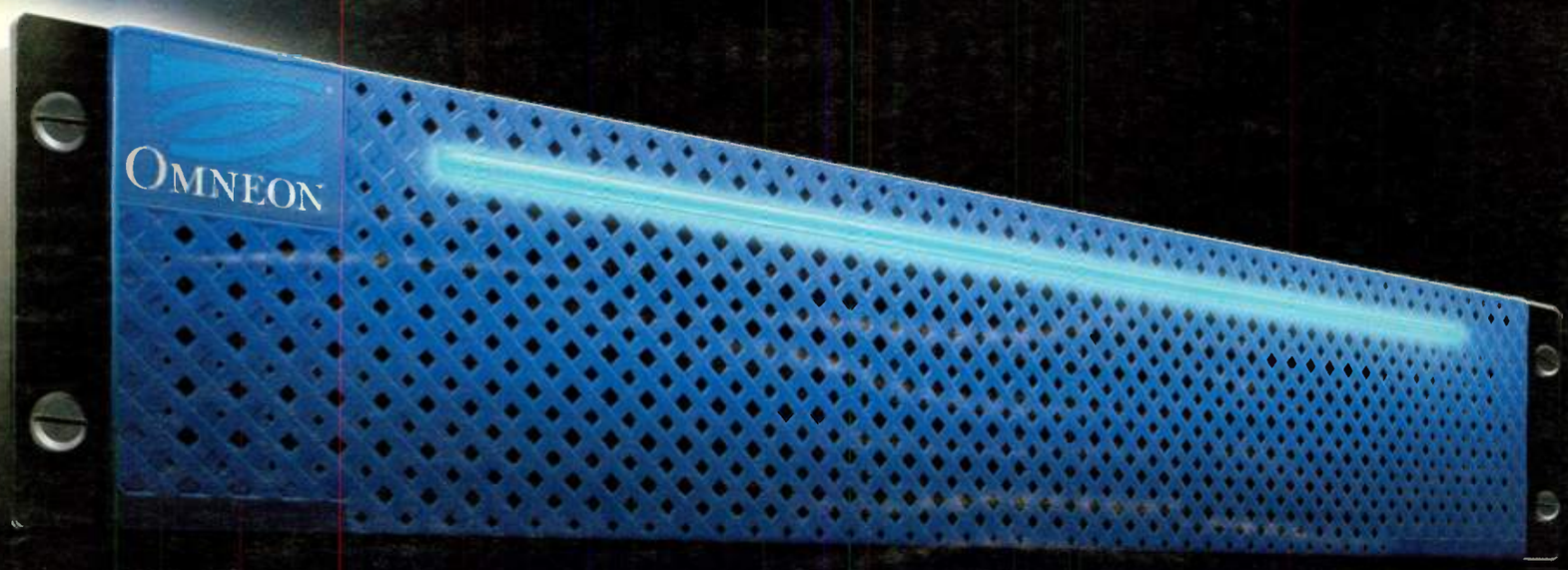

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Newcomer Wants to Kick-start iTV Ads

Backchannelmedia system combines broadcast, Internet to entice viewers

by Claudia Kienzle

BOSTON

Backchannelmedia projects that the $68 billion currently spent on broadcast television advertising could double to $140 billion if their new interactive, addressable advertising solution is employed.

"Our Backchannelmedia solution enables accountability that the conventional television advertising model doesn't currently offer," said Michael Kokernak, co-chief executive officer of Backchannelmedia. "Since viewers can immediately respond to offers they see in commercials, advertisers have the ability to quickly gauge the response to their ads and to use that feedback to refine the way they buy spot time in future media campaigns."

ACCOUNTABLE ADS

With the support of private funding, Backchannelmedia was founded in 2000 to develop a way for television advertising to become accountable. Kokernak says that he has spent the last 10 years doing exhaustive research into all of the broadcast and cable technologies involved in forming an efficient, automated, interactive advertising solution. In his 20-year career, Kokernak's career spans management positions in television advertising, home shopping networks and the financial sector.

Kokernak runs the company with Daniel Hassan who, as the son of Schering-Plough Chief Executive Office Fred Hassan, brings valuable connections within the Fortune 50 community, as well as knowledge of finance, mergers, and acquisitions from his work at Goldman Sachs. Harvey Koeppel, who is the company's chief operating officer, also comes from financial services, having served as a senior vice president of Citigroup 's global consumer group, and his expertise in processing millions of banking transactions accurately will benefit this large-scale interactive advertising platform.

The Backchannelmedia system uses existing remote equipment; no special equipment is needed, according to the company.

And also heading Backchannelmedia is Shane O'Donoghue, formerly vice president of technical services and quality assurance for the CBS Television Network, who is responsible for designing and constructing an engineering lab for testing broadcast infrastructure requirements and ensuring integration with set top boxes.

METADATA LINK

The Backchannelmedia software suite offers tools that enable special links to be inserted into a commercial, and it travels as metadata in the broadcast transport stream down to the viewers' two-way digital set-top box.

Viewers interested in responding to the offer can simply press one button on their remote control or use their cell phone pads and their requests are then saved to Backchannelmedia's Digital Gateway linking to that cable or DBS provider's Web site.

"From there, consumers can visit the Web site to purchase the product, download videos and music, or launch the advertisers' Web sites in a new browser within this 'digital gateway,'" Kokernak said. "So rather than just making an impression on viewers, the interactivity of the ad drives interested consumers to the Internet where they can investigate the advertised product, buy it, opt for a special offer, or take other actions."

According to Shane O'Donoghue, senior vice president of engineering for Backchannelmedia, this data can then be harnessed by the agency or advertiser to determine the effectiveness of a particular ad—since that metadata identifying that particular TV ad will be preserved and maintained with the response. So advertisers can determine which run times were most effective, and how consumer demand shifted over a period of time, among other feedback.

"When fully realized, this system will even be able to help advertisers target individual households, or viewers in a particular demographic profile or geographic location," O'Donoghue said. "And as more consumer data is recorded and analyzed, the system becomes more intelligent." The Backchannelmedia solution is also impervious as to whether the ad is viewed live, or using time-shifted technology, such as TiVo or DVRs. Viewers always have the option to click on the link on the TV ad because the metadata follows the content to the DVR.

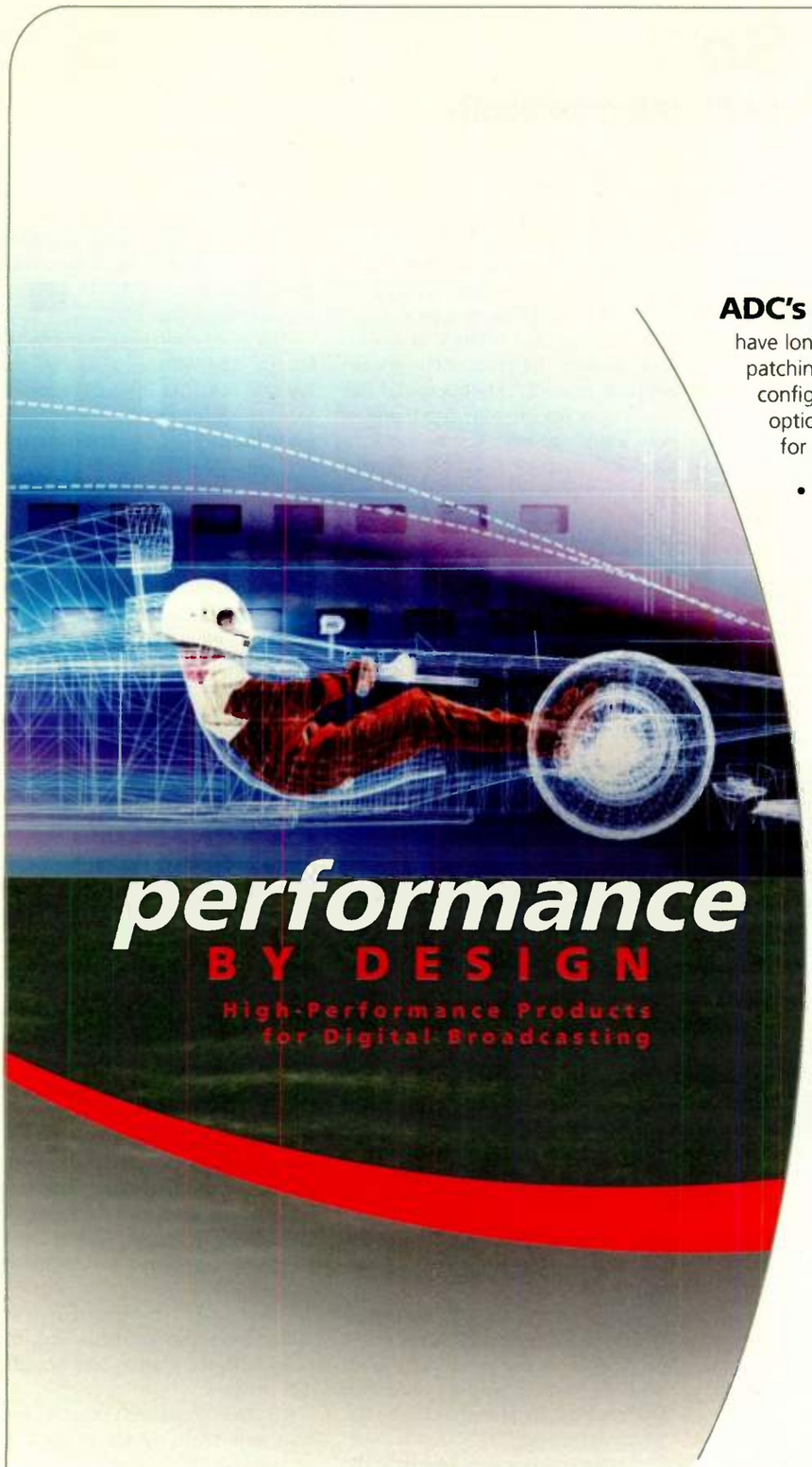
"This new digital platform is open-standards compliant, and works seamlessly with the existing broadcast and cable infrastructures and equipment already installed at stations."

—Shane O'Donoghue, Backchannelmedia

"This new digital platform is open-standards compliant, and works seamlessly with the existing broadcast and cable infrastructures and equipment already installed at stations," O'Donoghue said. "The interactive ads can be processed by industry-standard traffic and automation systems. It can also leverage the TVB ePort infrastructure [see related story] to execute lcoal TV ad campaigns."

Kokernak said that Backchannelmedia doesn't dictate spot pricing or reveal spot inventories or availabilities to advertisers unless stations select that as an option. Also, stations could potentially charge for the link as well as the spot time, and all of the broadcasters' new digital outlets could be included in the buy.

Backchannelmedia is currently developing and testing its solution in the hopes of deploying it by Feb. 17, 2009, the date that broadcasters will shut down their analog channels. ■



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Intercoms on the Go

Wireless production comms rely on flexibility, interoperability

Video Profiles & Perspectives

by Mary C. Gruszka

NEW YORK

Using intercoms for venue events like sports and entertainment productions often involve interfacing a variety of different makes and models of intercom products and systems.

For the Rock and Roll Hall of Fame induction ceremony at New York's Waldorf-Astoria Hotel last month, Firehouse Productions of Red Hook, NY, provided intercom for sound, lighting, video, producer stations and a couple of cameras, according to Mark Dittmar, vice president for Firehouse Productions. The company went digital with Riedel for the four-wire matrix and party-line (PL) intercom systems.

Firehouse linked three Riedel Artist 64 frames with fiber-optic cable. The frames were situated near the stage, at the front of house, and one near the All Mobile Video TV truck.

The Riedel system was interfaced to the Telex/RTS (Bosch Communications Systems) ADAM intercom matrix in the truck using 32 analog four-wire ports, although 24 were actually used during production.

"Everyone could talk to everyone," Dittmar said. "The truck took care of themselves, and we did intercom for everyone inside the venue. We used 12 Riedel master panels and the new Riedel Performer C3 digital beltpacks. We had 28 beltpacks and about 24 or 25 channels of PL."

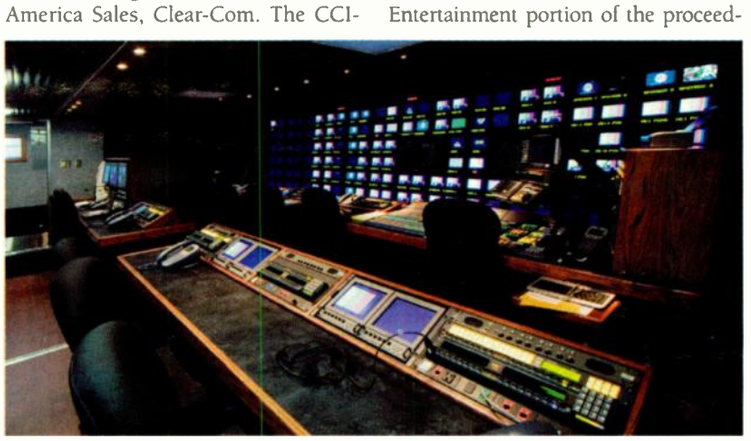
Firehouse also tied in a Telex BTR-800 UHF wireless intercom system to the Artist matrix.

For the MTV Music Video Awards at Radio City Music Hall in New York, Firehouse used more of a hybrid system with Riedel Artist frames, Telex/RTS two-wire beltpack (PL) system, Telex BTR-800 series UHF wireless and HME PRO850 digital wireless.

"We ran about 18 to 20 Riedel master panels, all inside the venue," Dittmar said. "We had a Riedel Artist 64 frame at the truck and one at the venue, connected via fiber. With Riedel it's faster to connect the frames. Instead of pulling copper wires, we pull a single piece of fiber."

The intercom system included 16 to 18 channels of Clear-Com (Vitec Group Communications) CCI-22 four-wire to two-wire converters to interface the Telex/RTS beltpack PL system to the four-wire Artist 64 frames.

"The CCI-22 module fits into a chassis, and takes any four-wire circuit like that from a Riedel or RTS matrix and converts it into balanced or unbalanced full-duplexed two-wire for party line beltpacks like Clear-Com or RTS," said Ed Fitzgerald, director, North America Sales, Clear-Com. The CCI-22 also supports Clear-Com signaling and has controls adjusting signal levels and nulling.



NMT's HD-12 high-definition mobile production truck uses a Telex ADAM frame with 64 ports of analog cards, 48 ports of AES-3 and 32 ports of RVON (VoIP).

The MTV Music Video Awards needed about 78 wireless stations. "The most challenging part was the wireless," Dittmar said. "We used over 400 frequencies."

AVOIDING INTERFERENCE

What's really catching on in these applications is digital wireless, like the HME PRO850 system that Firehouse Productions used at the MTV Music Video Awards.

"Because it's digital, it can operate into the 2.4 GHz frequency band," said Rick Molina, Product Manager for Professional Audio Division, HME. "The best part [about] being in the 2.4 GHz band is that you don't interfere with wireless mics and IFB."

The HME system uses technology called frequency hopping spread spectrum (FHSS). "It hops every 500 microseconds to a new frequency," Molina said. "It provides a good communication stream and with 64 bits of encryption, it keeps other people from interfering with you."

There are two versions of the user devices: The DX200 is a beltpack to which the user plugs in typical intercom headsets. The DX200C is a wireless cordless headset. "There's no beltpack or cord," Molina said. "The whole unit fits on your head, and is very useful for people who work in confined spaces or who don't want to hook a beltpack on their clothes."

Both units contain an intercom and an ISO button. "The ISO button lets those who depress it talk among themselves, independent of the intercom channel," Molina said.

At the NBA All-Star Game at the Thomas & Mack Center in Las Vegas, Wireless First used four Riedel Artist intercom matrices for the NBA Entertainment portion of the proceedings, including pre-game, time-outs, half-time, and post-game programming in the venue.

"At every break, or time out, when TV goes to a commercial, something is still going on in the arena," said Kevin Sanford, founder and president of Wireless First in Mount Vernon, NY. "So comms is huge."

Intercom frames were located at the front of house, at the house video position, in the truck compound, and in a room that served as the central intercom location, and were interconnected with a redundant fiber ring.

"We have to do that as some of the distances are 1,000 feet apart and copper is not an option," Sanford said.

NETWORKED FRAMES

Artist matrix frames come in sizes of 32, 64, or 128 ports. "The very basic idea behind the Artist intercom was to have distributed mainframes networked together over a redundant fiber ring," said Andreas Hilmer, director of marketing and communications for Riedel Communications in Wuppertal, Germany. "The networked frames behave like a single big system with up to 1,024 ports. Networking is non-blocking—all 1,024 ports are available everywhere."

The mobile production trucks used for the NBA All-Star game contained Telex/RTS ADAM matrix systems and were used for the broadcast of the game itself. For this event, the truck and entertainment intercom systems were not interfaced directly.

"We needed 28 different sources, and it made more sense to put in Riedel panels in the truck," Sanford said.

Overall, about 32 Riedel Artist 1016 16-key and 1012 12-key panels were deployed, fanned out from their respective frames.

"Panels are connected with AES-3 cabling—Cat5, coax or fiber," Helmer said. "If you use fiber connectors, you need an additional adapter. Panel data-like labels are put in the user bits of the AES signal. Since you have two AES signals on one connector, one can be used for intercom, the other for audio."

Other systems for the NBA All-Star game included Telex BTR-800/825 systems wireless PL systems interfaced with four-wire control of incoming and outgoing levels to and from the matrix frames.

For wired beltpacks, Sanford created a custom-built rack that included Clear-Com CCI-22 interfaces to the matrix frames, RTS 1626 selector panels, PS31 power supplies, and an 803 station for monitoring through a Wohler speaker panel. Also in the system were patchbays and Whirlwind multis.

About 10 channels of two-way radios were also available and interfaced with the matrix, and keyed via GPI closures.

Overall, about 100 ports of intercom were taken up for all the panels and various sub-systems.

In the central intercom room, a technician monitored the entire Riedel system from a laptop computer running Director configuration software. Any changes on any Riedel frame or panel could be done from this central control point. "The remote control function makes it very easy to troubleshoot and change things on the fly quickly," Sanford said.

Again, coordination on the RF side proved the most challenging. With the wireless intercoms, plus 24 wireless mics, 18 in-the-ear monitors, and spares, "you need lots of frequencies," Sanford said. ■

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RAISING PERFORMANCE

Network Takes Sports to the Extreme

From wakeboarding to motocross, Fuel TV provides 24/7 coverage

by Susan Ashworth

LOS ANGELES

To ease stress and put your day behind you, therapists of all walks of life tell you not to take your work home with you.

That rule hardly applies to the individuals who work at Fuel TV, an all-action-sports cable network that airs in 24 million homes in the U.S. as well as in Australia and Latin America. For them, following that particular piece of advice couldn't be *less* helpful. In fact, you'd fit right into the network's Los Angeles-based facility if you spent your weekend riding the early morning waves or ollying up curbs and steps on the skateboard on Saturday night.

You'll find very few buttoned-up corporate executives in the offices of Fuel TV. And that has actually helped make the four-year-old network a success, believes Scott Paridon, vice president of production and development.

After all, gaining a foothold in the action sports genre is a tricky path. Started by trailblazers who eschewed traditional sports in favor of weekends spent skimming skateboards across park benches and down treacherous stairway railings, the heroes in the extreme sports field have inspired an entire generation of kids to follow in their risk-taking, innovative footsteps.

So creating organized, corporate-approved television programming for an audience who preferred the alternative to the mainstream is a tricky proposition.

Fuel TV has managed to find that balance by listening to its own inner extreme athlete—be it a surfer, BMX rider or snowboarder.

"We live this life 365 days a year; we live the lifestyle," Paridon said.

That has helped hone Fuel TV's lifestyle and culture coverage of six main action sports—surfing, skateboarding, snowboarding, BMX, wakeboarding and freestyle motocross—with more than 170 hours of original in-house productions, in addition to commissioned series, specials and event coverage. In-house productions include biographies that focus intensively on the life of an individual athlete as part of its "Firsthand" series. The network also tapes an in-studio program known as "The Daily Habit," covers awards shows like the "Billabong XXL Global Big Wave Awards" and follows the burgeoning action sports film industry with "Blue Carpet Specials," which cover the film premiers of action sport movies.

Pro surfer Pancho Sullivan hits the waves on his first appearance on the Fuel TV show "Firsthand."

SIGNATURE STYLE

The network's signature style, however, may be its on-location coverage of sports like surfing and snowboarding, which takes the Fuel TV team to idyllic remote locales like Fiji, Chile and Tahiti.

"We've realized that a surf show is only as good as the waves are," Paridon said, so the equipment the firm uses needs to be able to catch the miniscule changes of intensity of an offshore wave, or handle the murky grey mush that seems to blur the boundary between a snowy ski hill and the sky above. The network uses Panasonic DVX100A 24p cameras as well as Canon XL-2 24p cameras. The Fuel TV crew rents small TV trucks while on the road.

"These images have been amazing for these types of sports," Paridon said. "Our guys just like 24p. It just looks better for the kind of work we do.

"Our work is really story-driven and athlete-driven. It's really important [that we use equipment] that allows us to capture that."

The equipment also has to be able to keep up with the stop-and-go nature of the network's coverage. Fuel TV recently put together a multi-location show with popular snowboarder Scotty Lago, who took the Fuel TV crew to California, then over to Japan, then back to Washington, then on to New York City.

Being able to pack up gear and take it easily onto an overnight flight is a key requirement, and the network has invested in portable light kits from Arri as well as foldable flat-panel lights that provide a natural glow without a fluorescent glare. Other equipment includes a host of Sennheiser wireless microphones, Sachtler heads and OGIO bags to pack it all up in.

"We need to be very mobile," Paridon said. "When our guys get off the plane, we need to not have these giant bags to wheel around. I think action sports in general has perfected [the importance of mobility] while in the field."

The network's cameramen have also had to prove themselves to be a bit more rugged than the average camera operator.

"Our guys are in the water, on the hill, out in the dirt," Paridon said, often struggling to hike through rough

"Our production looks different and sounds different from anything else out there."

—Scott Paridon, Fuel TV

SONY

The systems, applications and support you need to put HD to work today.

Real Systems. Right Now.

HD FOR ALL

This is news: KLAS goes with XDCAM HD newsgathering.

When KLAS Las Vegas took their Eyewitness News to high definition, they opted for full HD from acquisition to air. The CBS affiliate entrusted their newsgathering to a fleet of 18 Sony PDW-F350 XDCAM™ HD camcorders.

According to Doug Kramer, chief engineer, "XDCAM gear does more than help us make the transition to HD news production. It enables us to put more video on the air, faster, with the enhanced image quality that comes with HD resolution."

Right from the start, the station's ENG teams recognized the advantages of shooting onto Sony's file-based Professional Disc™ media. "When you turn the camcorder on or pop in a disc, you're ready to roll immediately," Kramer said. "Waiting for a tape to thread only takes seconds. But seconds in the field can mean the difference between getting or missing the shot."

"XDCAM HD enables us to put more video on the air, faster, with the enhanced image quality that comes with HD resolution."

— Doug Kramer, KLAS

KLAS also takes advantage of in-camera editing and the ability to review footage as thumbnails on the camcorder's LCD screen. Kramer notes that the LCD eliminates the need to have a separate playback monitor available for field producers. "We can go right to a specific clip and find the scene or shot we need," he said. "That saves us a lot of time."

Like KLAS, thousands of end users worldwide have dramatically improved their workflow with XDCAM HD file-based recording. In the process, they've discovered that XDCAM HD recording is a practical solution, ready for use right now.

The prototype XDCAM MPEG HD 4:2:2 camcorder is designed to advance high-end production with 2/3-inch sensors, native 1080i, 1080P and 720P, and recording of up to 1920 x 1080 resolution.

The new dual-layer Professional Disc™ media more than doubles capacity and recording time — to 50 gigabytes for up to four and a half hours of HD recording.

SKAI TV soars with the Sonaps tapeless newsroom.

SKAI TV has become the largest independent news provider in Greece by pursuing a familiar strategy: beating the competition with more timely, more compelling, better looking news. Without a legacy technology, SKAI could design their news operation from the ground up. Their choice? Sony XDCAM™ acquisition and the Sonaps™ newsroom production system.

According to Nick Millas, general manager of technical operations for SKAI TV, the benefits are dramatic. "To be first with breaking news, we need to ingest, edit and broadcast in minutes—sometimes seconds. Tape used to be effective, but with the help of the Sonaps newsroom, we are more accurate in editing, faster and more flexible."

"To be first with breaking news, we need to ingest, edit and broadcast in minutes — sometimes seconds. With the Sonaps newsroom, we are faster."

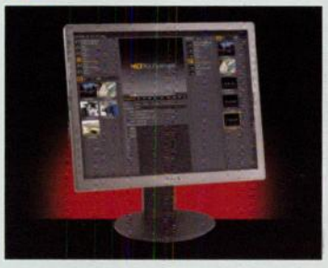
— Nick Millas, SKAI TV

The Sonaps system takes advantage of XDCAM metadata and Material Exchange Format (MXF) file-based recording. SKAI TV's HD-ready installation also features tight integration with the AP ENPS® newsroom computer system and Blue Order™ media asset management software.

Sony Professional Services (Europe) did the systems integration. Millas says, "Sony worked with us as partners throughout the implementation. They listened to our needs and provided answers straight away."

New at NAB 2007, Sonaps version 4.0 offers HD in addition to SD recording and integration with the Avid iNEWS™ newsroom computer system as well as the AP ENPS system. Version 4.0 also leverages powerful software modules from Sobey, a company with more than 200 networked production systems installed in Asia. The largest has 400 workstations and 40,000 hours of storage. All these advances suggest that for the Sonaps system, SKAI is not the limit.

HDXchange



Perfect for workgroups, the HDXchange™ shared storage system holds up to 250 hours of material. Features include proxy generation and browsing, multiple simultaneous access, plus flexible ingest, export and archiving.

Sonaps

With version 4.0, the Sonaps tapeless newsroom continues to move ahead with high definition capability, Avid iNEWS™ Newsroom Computer System (NRCS) and AP ENPS system integration, and powerful software modules from Sobey.

NEP purchases 150 Sony HD cameras.

From the major U.S. championships in football, baseball, basketball, racing and golf to high-profile entertainment and awards shows, NEP mobile production units have been there. NEP clients include all four major American broadcast networks, plus major cable sports. Now NEP has agreed to purchase 150 Sony HDC-1500 series cameras for the company's sports, entertainment and large-screen video reinforcement businesses.

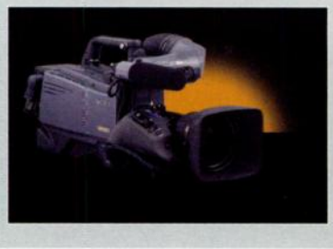
"We're the leading mobile production company in the US," says Lou Borrelli, chief executive officer of NEP. "Having a strong strategic relationship with Sony is one reason why. We need the best technology, the latest generation. It has to work in every conceivable situation and it cannot fail. That's why we bought Sony."

"We need the best technology, the latest generation. It has to work in every conceivable situation and it cannot fail. That's why we bought Sony." —Lou Borrelli, NEP

A true multi-format HD system, the HDC-1500 shoots 1080i or 720P, supports fiber or triax, and quickly converts from portable to hard camera configuration. "The paradigm in our business is utilization," says George Hoover, NEP's senior vice president of engineering. "Our assets have to work for as many clients as many days as possible. To have one camera handle every one of these applications is the Holy Grail."

The HDC-1500 portable camera and the HDC-1000 studio camera accommodate 1080/60P, 50P, 60i, 50i and 24P in addition to superb 720/60P and 50P. For customers who need only 1080i or 720P, Sony now offers the affordable HDC-1400.

The upgraded MVS-8000G live production switcher offers graceful SD to HD migration, slick device control and minimum signal delay—ideal for live sports.

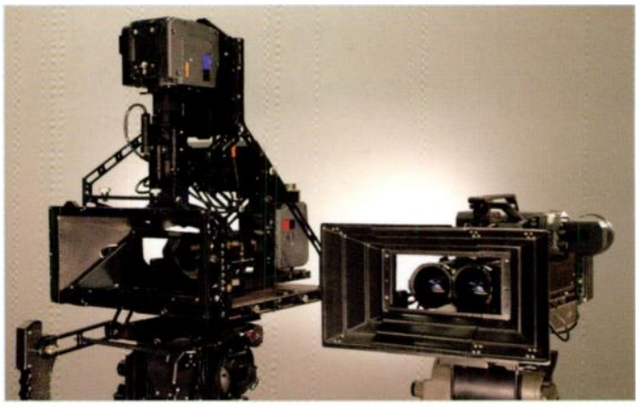


Sony's affordable new HDC-1400 high definition camera supports both 1080i and 720P and produces stunning imagery.

PACE and Sony capture three-point shots in 3D.

PACE, the entertainment company that is pioneering a resurgence in 3D content has just used stereoscopic pairs of Sony HDC-F950 cameras to capture the recent professional basketball all-star game in 3D.

Using the Pace/Cameron Fusion 3D System, six pairs of F950 cameras were deployed at the Thomas and Mack Center in Las Vegas. Camera operators in the arena were supported by engineers and a creative team in the control room, who adjusted the camera systems to extract the best 3D effect. "We let the operators in the arena do what they normally do and kept the 3D team away from them, in a critical viewing environment," says Vince Pace, CEO of PACE.



'Sony has been an importan part of this effort from the beginning.' —*Vince Pace, PACE*

Vince Pace is also an accomplished DP with credits on *Ghosts of the Abyss, Bismarck,* and *Aliens of the Deep,* all directed by James Cameron. "In the old days, the goal of 3D was to hit you over the head with the effect," Pace says. "Inspired by the vision of James Cameron, we're after something very different: using 3D to match the experience of being there as closely as possible. Sony has been an important part of this effort from the beginning. We had an open dialog and both the F950 camera and the SRW-1 recorder show that Sony heard our requests."

The professional basketball all-star game was switched on a Sony MVS-8000A switcher. An invitation-only audience saw the game live on giant screens at the Mandalay Bay Hotel, where pairs of stacked Sony SXRD™ projectors reproduced the 3D imagery. Later, the 3D images even captivated guests at the commissioner's party — people who had just seen the game live and in person.

The ultimate Digital Cinema camera for the 2/3-inch lens format, the new F23 captures 4:4:4 RGB data directly to a docked SRW-1 HDCAM SR™ recorder.

The SRW-5800 is Sony's first HDCAM SR studio deck to record and play 1080/50P and 1080/60P — which it does at a staggering 880 Mbps.

Soccer tackles web streaming with Anycast Station HD.

Chuck Blazer has big ambitions. As secretary general of CONCACAF, the regional affiliate of FIFA, he's out to increase the presence of international soccer on television, over the Internet, in video on demand and even on mobile phones. To that end, Blazer has overseen the completion of a multi-platform HD studio.

Situated in the Manhattan headquarters of CONCACAF, the facility includes Studio A with three Sony high definition cameras and a control room with a Sony MFS-2000 switcher. To get maximum value in minimum space, Studios B and C each feature Sony's compact HDC-X300 camera and a control room equipped with an Anycast Station™ HD system. "We needed a small unit that could compose various inputs into a single program, either for broadcast or the Internet," says Blazer. "The Anycast Station system gave us all the answers we needed in one place."

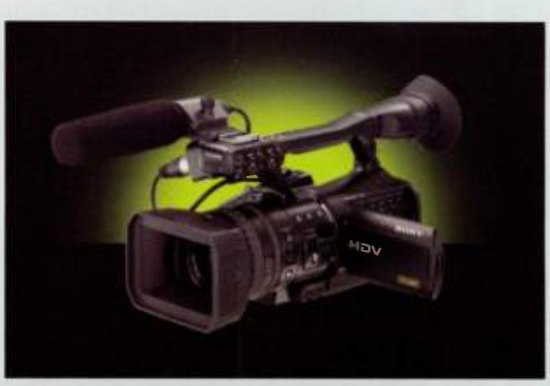
The Anycast Station HD live content producer is a briefcase-sized system. It incorporates the functions of a video switcher and audio mixer together with program, preview and source monitoring; a character generator and a web server in a self-contained, portable package.

Blazer also appreciates the system's portability. He says, "We'll be using the Anycast Station system both in-house in our smaller studios as well as taking it on the road when we are shooting in the field."

"The Anycast Station system gave us all the answers we needed in one place."

— Chuck Blazer, CONCACAF

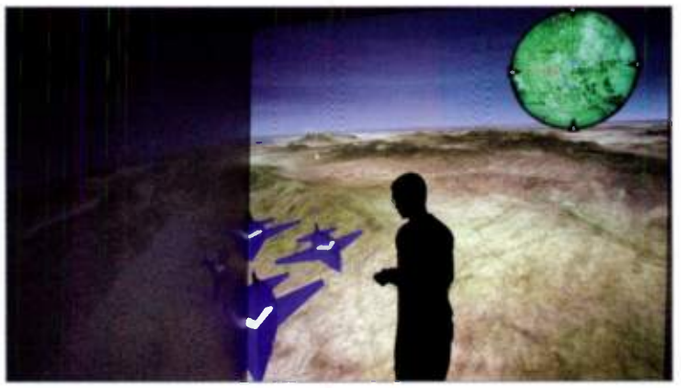
Preconfigured with HD inputs and outputs, the AWS-G500HD Anycast Station HD live content producer is the latest version of Sony's studio in a briefcase.



The world's first HDV™ camcorder with true 1080/24P scanning, the HVR-V1U also incorporates a ClearVid™ CMOS Sensor design of phenomenal performance.

"Virtual" challenges "real" at Iowa State University.

Scientists and researchers seeking the world's highest-resolution virtual reality room will soon be beating a path to Ames, Iowa. Here Iowa State University will use 24 Sony SXRD™ 4K projectors to generate 100 million pixels in 3D. The University's Virtual Reality Applications Center (VRAC) will install the projectors in C6, a room where 3D pictures are projected onto the four walls, floor and ceiling.



"This will significantly amplify the creativity and productivity of people." — *Jim Oliver, Iowa State University VRAC*

The VRAC will use the latest stereoscopic imaging and immersive viewing technologies to further research in such areas as genetics, urban planning and the control of unmanned aerial vehicles. "This will significantly amplify the creativity and productivity of people," says Jim Oliver, director of VRAC. "It will help us build on the Center's record as a world leader in virtual reality."

The original C6 room incorporated CRT projectors with resolution of 1024 x 1024 on each surface, for a total of 6.3 million pixels. The new design increases the resolution on each wall to 4096 x 4096 pixels, for 16 times the original detail. Each of the Center's Sony SRX-S105 projectors also delivers 5,000 ANSI lumens, for more than 20 times the original brightness.

With resolution of 4096 H x 2160 V, Sony SXRD 4K projectors deliver more than four times the pixels of the most advanced HDTV. For this reason, SXRD 4K projection has sparked an overwhelming response from end users in applications ranging from visualization and simulation to auditoriums and postproduction.

The LMD-2450W is the LUMA™ LCD monitor you wanted Sony to build, with one-piece design, full 1920 x 1080 resolution, 1080/60P input, waveform monitoring and audio metering.

Beneficiary of 34 Sony patents, the new BVM-L230 critical evaluation monitor has the widest color gamut of any Sony direct-view display.

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For years Sony has worked with other industry leaders to develop the total broadcast production environment based on the MPEG-2 codec. So you can now select from ready-to-go MPEG-2 tools from Adobe, Apple, Avid, Canopus, Grass Valley, Harris, Matrox, Omneon, Quantel, SGI and Sobey — plus 21 other leading companies. The MPEG-2 advantage is not just about camcorders, but also editing, workgroup storage, networked production, play-to-air, archiving and media asset management.

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HD FOR ALL

Fuel TV producer Eric Hemans films pro wakeboarder Rusty Malinoski

Fuel TV's David Paine sets up a Panasonic camera

Keifer Sutherland guest-starred in last season's finale of "American Misfits" on Fuel TV.

backcountry terrain and diving down with sharks like to make sure they're getting the right shots. "They're out in the trenches," he said, and that out-in-the-trenches philosophy has helped set Fuel TV apart from the competition.

STANDING OUT

Back in the relative calm of the studio—which the network shares with Fox Soccer and Fox Interactive Media as it is a division of Fox Cable Networks—the network uses an Avid Adrenaline system connected to Unity providing up to 6 TB of storage, as well as standard Sony Betacams and Grass Valley gear. Graphics are handled by outside firms.

"Our production looks different and sounds different from anything else out there because of the way we present things," Paridon said. "The X Games [that airs on ESPN] is one weekend a year. We live the lifestyle. From the top down, the way that our network looks and sounds is different."

The demographic that Fuel TV is reaching—viewers aged 13 to 24—is a bit younger than is typical for traditional sports programming. "There are as many kids skating now as there are doing Little League," Paridon said. "And these are the early adopters, these are the trend setters, these are the ones who are on the cutting edge of new technology and are more savvy than the generation that came before."

And that has huge appeal to advertisers.

"All that stuff—the cell phones, the games, the Internet—[the kids] understand it all," Paridon said. "That's really attractive to advertisers."

The network has created programming with this young demographic in mind, most notably the kids program "New Pollution," which seems to have struck a chord with viewers, he said.

The network will next put its gear and staff to the test to cover the Women's World Tour sponsored by the Association of Surfing Professionals, a round-the-world surfing competition that started this month and will highlight the efforts of the top 17 women surfers in the world. The tour will take Fuel TV to seven events in Australia, Brazil, Spain and Hawaii, where the network will use a four-camera setup to cover the events, including a two-camera team on the beach to scan the surfer as she moves down a wave, a small handheld camera for on-the-beach interviews, and a Panasonic 24p camera in a water-tight housing in the water.

"Our goal is not just to cover the event, but also display the outgoing personalities of these women tackling 20-foot waves," Paridon said.

The network has also begun to dabble in HD, though hasn't committed to the technology with any major purchases. "But nothing is better for HD than what we do," he said. "We're moving in that direction because we know that our viewers want to see it."

The network also feels it has a responsibility to cover these kinds of extreme actions sports in a certain way, Paridon said. "We feel we're the torchbearers when it comes to the way these sports are covered," he said. "Authenticity is the most important thing in this business, and we do it because we love it." ■

Taking HD to a New Extreme

NEW YORK

There's not much that looks better in HD than sports—and in the opinion of the high-definition network VOOM, it's even better when those sports are fast-paced, high-pressure and extreme as they can get.

The network put that concept to heart with the creation of "Focused," an extreme sports series shot in high-definition as part of the network's RUSH HD channel.

Entering its third season, "Focused" features skiers, kayakers and mountain bikers exploring far-flung, exotic locations, all in an effort to showcase some of the riskiest, most daring sports in some of the most beautiful locations in the world, and all in high-definition.

"Viewers who watch our shows actually feel their stomach lurch" as a base jumper sails over waterfall or a skier jumps over a crevasse, said Mark DeAngelis, vice president of programming and development for VOOM HD. "Our goal is to really capture that experience."

As opposed to athletes participating in organized competitions, the individuals that appear on "Focused" are a different kind of athlete, said Rob Faris, RUSH HD executive producer. "They're daredevils searching to prove their skills over the next skier. They could risk their lives in one stunt, yet they do these things over and over."

The production team covering these events is also put to the test, following athletes to on-site locations in India, Cambodia, Iceland and the Canary Islands with a set of HD gear that has been as high as it's been low—to the peaks of Mount Everest, all the way down into the trenches for deep-sea dives. That means the equipment must be as durable as it is portable.

"This [network affords us] a great opportunity to take advantage of the [HD] format," DeAngelis said, with all the clarity and precision that it affords.

The network differentiates from other action programming by taking a film-like approach to its coverage.

"We're able to create a film experience with this format and the technology," he said. "The spirit of RUSH HD is that it delivers a cinematic experience."

For an extreme skiing event, the team might use three HD cameras, two on-slope cameras, and an aerial camera. The team then might shoot some signature aerial shots with handheld cameras from a hovering helicopter. Producers might put a two-camera crew in a helicopter, with one cameraman hovering over the mountain, while the other is dropped off on the slope to follow a skier down the hill.

Photo courtesy VOOM HD Networks

Shot in the foliage of New Zealand, harnesses help get smooth HD footage of mountain bikers for RUSH HD's Focused.

Equipment that tends to go on each shot includes a Sony HDW-750/1 camcorder, Sony HDW-F900 HDCAM camcorder and Canon HJ16x8B zoom lens. Other gear used for very specific shots includes a Panasonic Varicam, which is used for intense action shots, Canon HJ11x4.7B wide-angle lens, Sony HDV MiniDV for POV action shots, and a Sennheiser MKH-418 stereo shotgun mic.

The show takes the team all over the world, such as Victoria Falls in Zambia, where cameramen rappelled down the falls with HD cameras on their backs. For additional shots, the team draped cables between two trees in the woods and even strapped themselves to a hang-gliding harness to shoot the maneuvers of a mountain biker heading down a hill.

Shooting programming for the series has put directors and the team in their share of precarious situations.

"The most horrifying thing I've ever done with a camera on my back was kayaking through hippo pods at 4 a.m.," said "Focused" director Nate Nash.

Other action sports series on RUSH HD include "Nomads," which showcases adventure expeditions, and a one-hour documentary series called "The North Face Expeditions," which won several awards in 2006 for its humanitarian work, in which professional athletes worked to bring a team of doctors to remote locations where medical care is scarce.

The VOOM network produces 15 high-definition channels, with programming that ranges from music and film to art and animation. The network was originally created in 2003 to "take advantage of the palette, clarity and color of high-definition technology," said Sharon J. Kahn, vice president of communications for VOOM HD Networks. "We wanted to create a full array of HD programming that was commercial free."

Susan Ashworth

BOOK REVIEW

JAMES E. O'NEAL

Restoring Baird's Image

Book sheds light on TV pioneer's early work

by Donald F. McLean

The Institution of Electrical Engineers
ISBN 0-85296 795 0

FALLS CHURCH, VA.

A lot of us take it for granted that electronic recording of television images began with the release of Ampex's first quad machines in 1956, and that video disc recordings didn't come along until the 1970s. We were wrong on both counts!

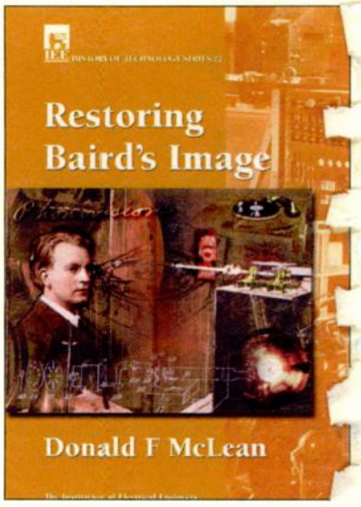
More than two decades ago, Donald F. McLean unintentionally discovered evidence of television recordings that dated back to the late 1920s.

McLean had borrowed a record album featuring a "light-hearted" narrative history of television. On that album was a small audio snippet which allowed listeners to "hear" what 1920s 30-line broadcast television signals sounded like to individuals encountering them on their radio receivers.

By nature, a curious, very computer-literate person, McLean quickly cobbled up some hardware and wrote a few lines of code to try and make sense out of the "swarm of angry bees" sound that issued forth from his record player. Luck was with him, and rather incredibly he was soon viewing a head and shoulders shot of a man—a television image scanned more than 50 years earlier.

Since unlocking this video time capsule in 1981, McLean has spent much of his spare time searching out other such early video recordings and developing a full understanding of how they came about and the technology used to generate them.

In his quest to learn more about these recordings, McLean located and interviewed a number of persons that had been directly connected with the first attempts to develop and commercialize television. The efforts of his years of research have been captured in a book, "Restoring Baird's Image."



PIONEERING EFFORTS

The work provides not only an account of McLean's quest to retrieve information from video recordings made in the late 1920s and early 30s, but also a look at the early history of television itself. The pioneering efforts of Paul Nipkow, Ernst Alexanderson, C. Frances Jenkins and others are described, but since the book is about the recording of John Logie Baird's 30-line television signals, the spotlight is on Baird himself, a Scottish engineer who first produced viewable television images in 1924 and was publicly demonstrating his system the following year.

McLean not only has compiled a very complete history of Baird's work with television, he also has rounded

BAIRD, PAGE 12

Transmitters

CONTINUED FROM PAGE 10

then was that at contamination levels of 50 parts per million and above you had to remove and properly dispose of the item. We had to have the people in white suits come in."

Jellison said the problematic transformer was removed several years ago, but not without the help of a 20-ton crane, a forklift and some torch work. The cost for the physical removal amounted to nearly $10,000, probably $20,000 to $25,000 in today's money. Disposal costs were additional and not cheap either. Fortunately no building modifications were involved. The situation was different at another Clear Channel facility.

"In Lexington, Ky., some walls had been added when the infrastructure grew," Jellison said. "The transmitter couldn't be taken out through the doors it came in. New doorways had to be cut into the building."

Jellison cautions station personnel to exercise care with regard to disposal of transmitters that may contain PCBs.

"People have served hard jail time for improperly disposing of PCB contaminated equipment," Jellison said. "Get rid of this stuff now. The rules are that if [PCB-bearing] equipment is abandoned—not used anymore—it must be disposed of and not left to sit around."

Jellison flagged other liability issues with other transmitter components that could exist in a few decades or less.

"People will be used to solid-state and may not be aware of hazards associated with tube technology," he said. "Everybody now knows what to do or not to do around these transmitters—this may not be the case in 25 to 30 years."

DONATIONS

Most broadcasters are using state-of-the-art equipment. However, some stations may be trying to nurse the last bit of life out of an older transmitter before retiring it completely in 2009. Others may have a vintage backup transmitter left over from their first sign-on. Some of these truly classic models should be preserved, but due to the physical size and transportation costs, few museums seek transmitters. There are a couple of exceptions.

One of these is the Bolack Electromechanical Museum in Farmington, N.M. Owner and curator Tommy Bolack already possess a number of large transmitters and says that he has space and will consider additional donations. He may be contacted at 505-325-4275.

Another museum potentially interested in acquiring transmitting equipment is the Early Television Museum in Hilliard, Ohio. Space there is somewhat limited, but founder and curator Steve McVoy is interested in speaking with anyone who might want to make a donation. He may be contacted at 614-771-0510 or at *etf@colombus.rr.com*. ■

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Baird

CONTINUED FROM PAGE 20

up a rather astounding number of photographs of early television apparatus, pictures of persons involved in one way or another with television and of off-screen images from the first decade of the medium's existence.

mass and a very intriguing series of screen shots that show just how good 30-line images can be and the amount of visual information that they could convey.

VERA, AMPEX & EMITRON TOO

McLean's photo gallery does not end with mechanical television's ultimate fade to black, but continues

Television is a visual medium, and McLean's selection and number of photographs go a long way to both maintain the reader's interest and also to explain what was going on in television 70 or 80 years ago.

McLean has supplemented these excellent images with drawings from patent applications and other sources, as well as some computer imagery that he generated to better explain the workings of early television recording equipment.

Television is a visual medium, and McLean's selection and number of photographs go a long way to both maintain the reader's interest and also to explain what was going on in television 70 or 80 years ago.

Particularly captivating are images showing what a 30-line mechanical television control room looked like, a 1938 120-line color camera that puts RCA's TK-40 to shame for size and with equally captivating shots of such milestones as Ampex's prototype video recorder, the BBC's VERA (vision electronic recording apparatus) recorder, a Moy-Cintel kinescope recorder and even images of early electronic pickup tubes including a Farnsworth image dissector and an EMI Emitron.

Taken as just an historic photo album, McLean's book would be a volume well worth acquiring by anyone seriously interested in television history. Above and beyond the book's absorbing illustrations, however, there is a great deal of equally interesting narrative about McLean's decades of research into early television.

As his book is an outgrowth of McLean's efforts to recover 80-year-old recorded images from the 78 rpm phonograph records upon which they were impressed, the reader will find a very complete accounting of what the author was faced with, once he had located still extant recordings. (Time, and in one case, a World War II German bomb, has considerably reduced the number of recordings.)

Restoration of audio recordings from early 78 rpm discs is a daunting enough undertaking, but producing viewable images from such media is several orders of magnitude more challenging.

A 30-line image of early BBC television performer, Betty Bolton (1934 or 1935).

Not only was Baird's television system operating with only about 1/20 the resolution with which we are accustomed today, the recording apparatus used introduced its share of artifacts into this low-resolution video. McLean had to devise methodologies not only for recovering the recorded i-mages, but also for stabilizing them, and as complete a removal of artifacts as possible in order to produce recognizable images.

Interestingly enough, one of the more grievous problems was due to off-center location of the centering hole punched into the discs. McLean points out that precise centering is needed to keep the video flowing at a uniform rate, as there was no synchronizing information recorded along with the pictures. He observes that if the disc centering is only off by only 0.5 mm, the observed effect is that images "would roll three times one way then three times the other on every turn of the platter."

Dealing with the effects of another and rather unique form of video signal distortion, was also a factor in recovering information from the recordings.

Curiously enough, the record cutting head was not driven di-rectly by Baird's video amplifier. Interposed in the signal path from Baird's imaging device was a pair of electro-acoustic transducers (speaker and microphone) with an air gap interposed between them, thus adding another source of distortion into the recorded images.

Digital processing technology was used to combat problems in timing, phase and frequency issues, noise, cutting head resonances, signal dropouts due to corrosion (some recordings were made on aluminum blanks) and other problems.

McLean did succeed in cleaning up the recordings to produce viewable and recognizable images. He didn't leave it there, though.

As the images were revealed, there was considerable interest in obtaining more information about the discs and about the dawn of television itself. McLean describes the upshot of these efforts, which resulted in locating one of the performers, Betty Bolton—the first performer to appear on the BBC's 1932 30-line television service. McLean even succeeded in identifying a dance troop—the Paramount Astoria Girls—that appeared on a 1933 disc.

Readers who don't know much about Baird, or who thought he bowed out of television after his 240-line mechanical system was knocked out of the running for acceptance as a national standard for Great Britain in 1936, may be surprised to learn that he kept his hand in television, inventing practically up until his death in 1946. Two years earlier, he had demonstrated the world's first all-electronic color television, operating at 600 lines and utilizing a tricolor cathode ray tube of his own design as a display device.

BAIRD'S ACCOMPLISHMENTS

Baird has to be recognized as a true visionary. Before the decade of the 1920s ended, he had demonstrated not only television, but also stereoscopic television, color television and the televising of images in the dark via the use of infrared illumination. Perhaps most startling in an examination of his patents is number 324,049. This was his "Phonovisor," *a portable video disc player.* Today's portable DVD player embodies its concepts! Baird applied for his first video recording patent in 1926.

Evidence of Baird's forward thinking is perhaps best captured in a note appended to a Phonovision record found in England's Science Museum in South Kensington:

"There is no reason why television signals should not be recorded and used to reproduce the televised signal at a later date, although the cinema film forms an easier method than electrical storage at the present time. This gramophone record, made by Mr. J.L. Baird in 1928, is an example of an early attempt to make an electrical, as opposed to an optical record of a scene."

McLean has done a masterful job of capturing not only his decades-long odyssey in searching out and restoring Baird's 80-year-old video recordings, but also in bringing the inventor's seminal work in television to the attention of those who might have otherwise overlooked it.

He deserves special praise for researching this almost forgotten part of television's rich history. I highly recommend his book to the television historian, or to anyone remotely interested in what was happening in the field of television 70 and 80 years ago. ■

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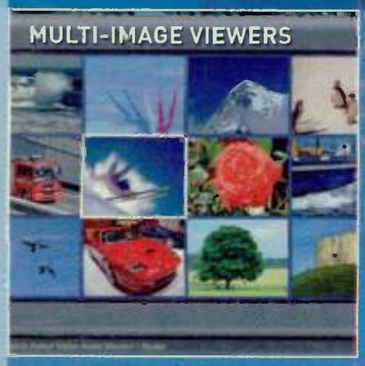

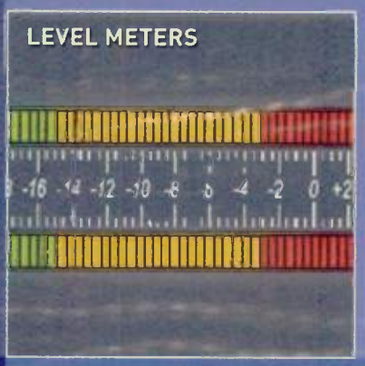

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Trade Shows & Tax Write-offs

Know the rules about convention deductions

by Mark E. Battersby

ARDMORE, PA.

Imagine an enjoyable—and educational—vacation, with Uncle Sam picking up part of the tab in the form of our tax laws.

That's right, every television station, the owner and employees of that broadcasting business (even someone who is a shareholder/employee) can legitimately claim an income tax deduction for the expenses paid or incurred while attending trade shows, conventions and meetings, including NAB.

Naturally there are restrictions. A major downside to the convention expense deduction is that it is not available for the expenses of attending a convention or meeting related to investments or other income-producing property.

On the plus side, the Internal Revenue Service recently updated the rules for deducting the expenses incurred while traveling on business. Those revised guidelines contain an optional method under which both self-employed broadcast professionals and station employees who are not reimbursed can utilize the per-diem allowances.

Thanks to our tax laws, the government will pick up the tab for a sizable portion of your expenses while attending a trade show or convention—if you follow the rules. Usually all that is required to qualify for convention-related tax deductions is that you be able to demonstrate, if asked, that attendance at the trade show, meeting, convention or other event benefited your radio station or broadcasting business.

ESSENTIALS

The expenses incurred while traveling to the site of that convention, trade show or event are, as mentioned, tax-deductible.

Tax-deductible travel expenses include the cost of traveling by plane, train, bus or car between your home and the site of the meeting, convention or trade show. Also included are the expenses of taxicabs, commuter bus and airport limousines, baggage and shipping costs for samples or display materials, lodging and meals, cleaning, telephone and even tips. And, of course, the costs associated with attending the convention itself.

ENTERTAINING

Part of the fun associated with attending a trade show or convention is the meals. Well, maybe not in the meals themselves, but the fact that those meals offer a station manager, engineer or supplier the opportunity to entertain potential customers or vendors seems to make them more enjoyable. Even when those convention-related meals do not involve entertainment, the tax deduction for the expense of those meals frequently makes them taste better.

Unfortunately, when it comes to meals, the tax rules contain quite a few restrictions—as well as a number of loopholes.

Generally, expenses for meals include all amounts spent for food, beverages, taxes and related tips. The tax deduction for meals is labeled by the IRS as "entertainment," however, and is generally limited to 50 percent of the amount actually spent.

Under the tax rules, those attending a trade show or convention, away from home overnight, are permitted to use either the actual cost of the meals or a standard amount to compute the tax deduction for convention-related meals. If you, as an individual, are reimbursed for those expenses, how you apply the 50 percent limit depends on whether your employer's reimbursement plan was accountable or non-accountable.

BRINGING COMPANY

Should any attendee's spouse, family members or others accompany them to trade show or convention, either the attendee or his or her broadcasting business can deduct their travel expenses. But only if that individual:

- Is your employee;
- Has a bona fide business purpose for the trip; and
- Would otherwise be allowed to deduct those convention expenses.

In order for a bona fide business purpose to exist, the broadcaster must prove a real business purpose for the individual's presence. Incidental services such as typing notes or assisting in entertaining customers is no longer enough.

Consider a television station owner, Michael Peters. He drove with his wife Mary to Vegas to attend the convention. Because Mary is not Michael's employee and even if her presence serves a bona fide purpose, her expenses will not be tax-deductible.

Michael pays $115 per night for a double room. A single room costs $90 per night. He can deduct the total cost of driving his car to and from Las Vegas, but only $90 per night for his hotel room. If he uses public transportation, he can deduct only his fares.

As mentioned, as an alternative to the actual cost method, both self-employed business owners and employees can deduct a standard amount, a so-called "per-diem allowance" for their daily meals and incidental expenses while attending a convention.

However, even when this standard meal allowance is used, records must be maintained proving the time, place and business purpose of any travel or convention attendance. If your employer is related or is an incorporated broadcasting business in which you are more than a 10 percent owner, the standard meal allowance cannot be used.

The standard meal allowance is the official Federal Meals and Incidental Expense (M&IE) rate. After Oct. 1, 2006, the standard meal allowance varied between $45 and $58 per day, depending on the area traveled to. Maximum per-diem rate, including

TAX, PAGE 26

Every station, owner and employees can legitimately claim an income tax deduction for the expenses paid or incurred while attending conventions.

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Tax

CONTINUED FROM PAGE 24

lodging, varied between $148 and $246 per day during the last quarter of 2006 and into 2007.

OPTIONAL METHOD

The IRS's new Revenue Procedure provides an optional method for self-employed broadcasting professionals as well as employees who are not reimbursed to use in computing the deductible costs paid or incurred for business meal and incidental expenses. The optional method also covers incidental expenses only if no meal costs are paid or incurred while traveling away from home.

The term incidental expenses means fees and tips given to porters, baggage carriers, bellhops, hotel maids, transportation between places of lodging or business and places where the convention, trade show or meeting is held or meals taken.

In lieu of using actual expenses in computing allowable incidental expenses paid while away from home, employees and self-employed individuals who do not pay or incur meal expenses may use an amount computed at the rate of $3 per day. Thus, while attending a convention or trade show under an all-inclusive plan where meals are included, employees and self-employed broadcasting professionals may claim a legitimate tax deduction for incidental expenses of $3 per day without the need of substantiating that claimed amount.

The tax rules clearly state that all travel expenses are tax-deductible if the trip to the convention or trade show was entirely business-related.

FURTHER ENJOYMENT

The tax rules clearly state that all travel expenses are tax-deductible if the trip to the convention or trade show was entirely business-related. Suppose, however that an attendee decides to combine that trade show attendance with a vacation?

So long as the trip is "primarily" for business purposes and, while at the convention or trade show, you extended your stay for a vacation, made a non-business side trip or had other non-business activities, you may still deduct your business-related travel expenses. Among the expenses directly related to attending a trade show or convention are such things as the travel costs of getting to and from the convention destination and any business-related expenses at that destination.

If, however, the trip was primarily for personal reasons, such as a vacation, the entire cost of the trip is a nondeductible personal expense. Naturally, you can deduct all expenses incurred while at your destination that are directly related to attendance at the trade show or convention.

BACKING IT UP

In order to claim any tax deductions, every broadcast facility owner/manager must be able to prove that the expenses were actually paid or incurred. In fact, the following expenses, which have been deemed by the IRS as particularly susceptible to abuse, must generally be substantiated with adequate records or sufficient corroborating evidence: Expenses with respect to travel away from home (including meals and lodging), entertainment expenses and business gifts.

Meals and incidental expenses while away from home on business, especially those related to attending a trade show or convention, are a legitimate tax deduction—either the actual amounts spent or the standard M&IE rate provided by the government.

Remember, however, although the actual amount of the deduction can be taken from tables provided by the IRS, it remains necessary to prove, through adequate records or sufficient corroborative evidence, the time, place and business purpose of the convention travel.

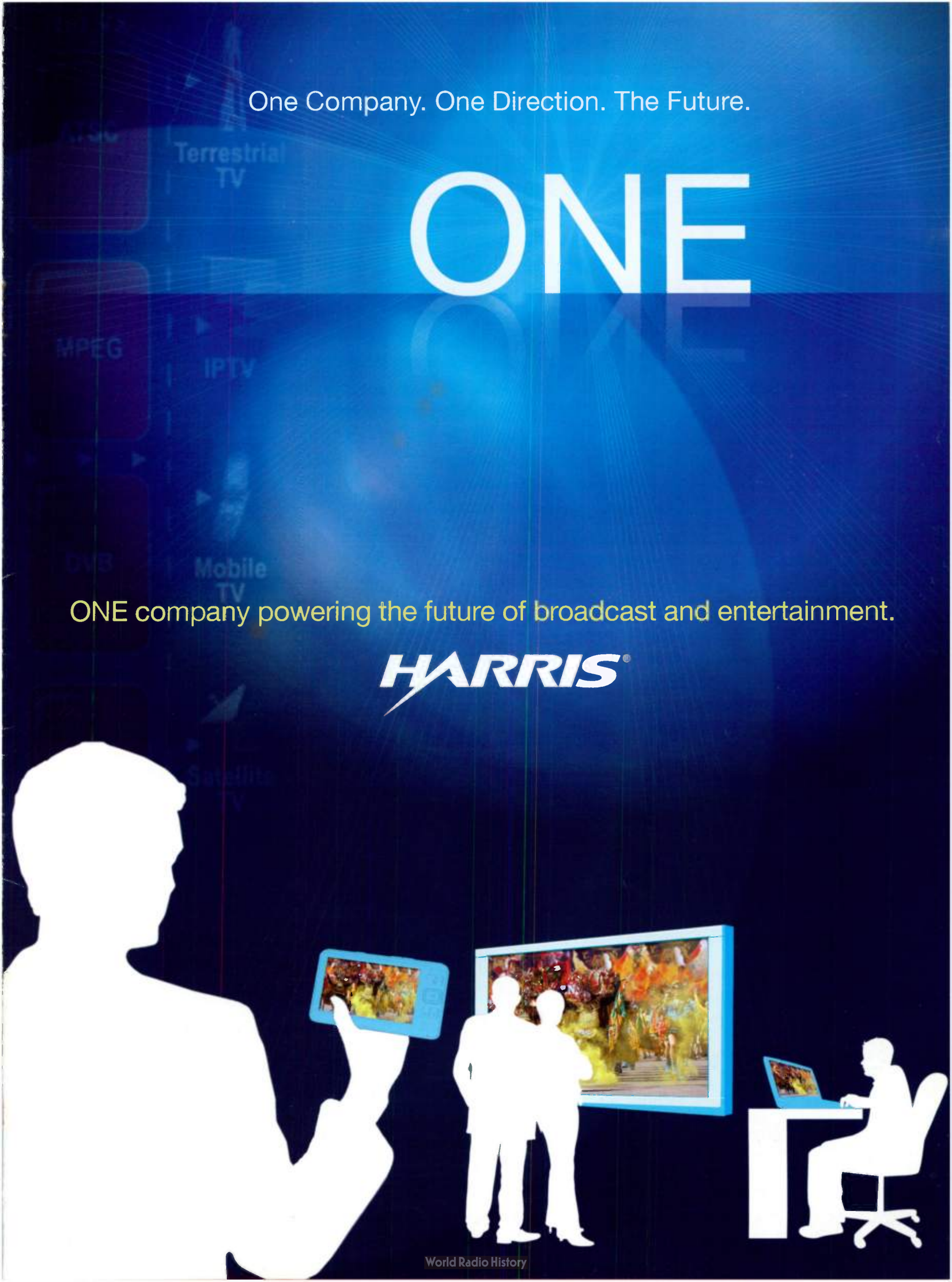
EDUCATION, FUN & BUSINESS

It should be evident that every station owner and manager can write off or deduct the expenses of attending a trade show, meeting, convention or other event. Under our tax rules, all that is required is a legitimate business purpose for attending that meeting, convention or trade show.

In reality, the agenda of the convention does not have to deal specifically with your broadcasting business; it is enough that you reasonably can be expected to gain some business benefit from attending that event.

Imagine reaping business benefits, an education and enjoyment wrapped up in one trip to NAB or any convention, trade show or meeting. Best of all, thanks to our tax rules, those expenses may qualify as a legitimate tax deduction.

Mark Battersby is a tax and financial writer based in the suburban Philadelphia community of Ardmore, Pa. ■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The ONE company moving broadcast television into the IT media world.

by Tim Thorsteinson, President
Harris Broadcast Communications Division

Just a few years ago, the traditional Harris customer was a television broadcast station operator with a signal covering a radius of about 60 miles. The broadcast division of Harris prior to 2000 was primarily a transmitter business, which — with more than 70 major technological "firsts" to its credit — earned worldwide regard as one of the industry's foremost developers of analog and television transmission systems.

In those days of analog delivery, that simple tower had complete and sole control over its territory. But the digitalization of broadcast media has completely changed the media landscape, with consumers now able to receive media in a multitude of ways — podcasts, streaming media, cable, YouTube, satellite, broadband multichannel pay TV, and so on.

The world of broadcast media is going through radical change driven by the evolution of digital technology, and customers are looking for manufacturers to help them navigate this transitioning market. In today's constantly changing environment, customers want more than a "supplier"— they want a strategic technology partner.

In the last five years, Harris has made significant investments to expand and develop its broadcast offering and become the industry's leading technology partner. Through a series of strategic acquisitions and internal development, Harris has moved from a base that focused largely on radio and TV transmission, to become a company that is positioned for success in the new digital age.

"In today's evolving market, it's no longer enough to have great point products. Customers want our products to work together in workflow solutions better than a collection of products from our competitors ... Interoperability is a key differentiator."

Today, Harris Broadcast Communications is well known across the industry as a leader in the global markets it serves, providing products, systems and services to customers in more than 125 countries. With a significantly broadened customer base that now includes ad agencies, small cable companies, cable networks, international media companies, and mobile TV and IPTV operators, Harris BCD is participating fully in the "new media" business models.

The Harris 'ONE Company' Approach

Without question, millions of dollars in acquisitions bought us a broad and impressive portfolio of products. But in today's evolving market, it's no longer enough to have great point products. Customers want our products to work together in workflow solutions *better* than a collection of products from our competitors.

As the media business becomes increasingly complex, broadcasters are focused on streamlining their everyday operations, while also looking for a single, flexible and integrated approach that allows them to capitalize on the numerous benefits of IT. Interoperability is a key differentiator.

So over the last year, Harris has invested significant time and resources toward integrating our technologies, people and locations in order to provide greater value to our customers. As a result of these efforts, Harris is no longer running as a portfolio of independent businesses, but rather as a workflow-oriented technology partner to the broadcast industry.

Through our recent acquisitions and continual investments in R&D, Harris is now one company — the *one and only* company in the industry, in fact — that is in a position to innovate along the entire broadcast delivery chain, tying workflow and signal flow together in ways that make customers' organizations more agile and more responsive to change.

The Harris "one company" approach has a single purpose: to make our customer's job easier. Customers benefit from having one point of contact. One fully integrated workflow solution. One number to call for support. One source of technical expertise and guidance along the broadcast chain for functions from staff training to envisioning exercises. It all comes down to one easier way to do business.

"Harris has moved from a base that focused largely on radio and TV transmission, to become a company that is positioned for success in the new digital age."

By providing integration across the entire Harris product portfolio — and across the entire broadcast delivery chain — we are able to offer broadcast customers integrated technology solutions that improve their workflows, save them money and enable new revenue streams from emerging media markets.

One Company. One Direction. The Future.

Harris Corporation's heritage in broadcast technologies and experience providing best-in-class products and enterprise platforms have enabled us to bring to market a next-generation portfolio that supports content throughout the workflow application chain. Our integration initiatives are producing powerful broadcast workflow solutions that enable customers to realize new revenues, repurpose content, target their advertising and deliver their brand.

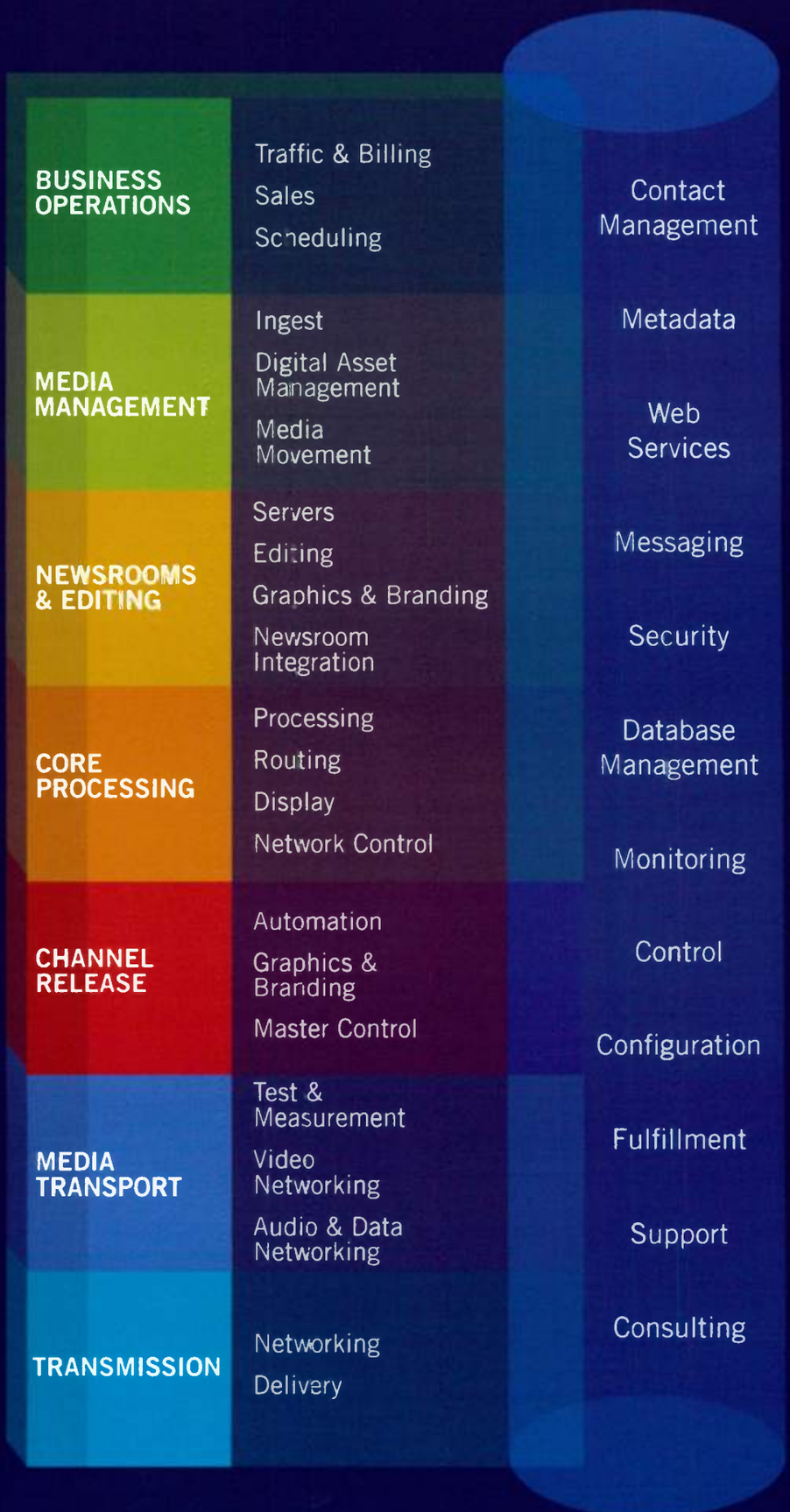
"Harris is no longer running as a portfolio of independent businesses, but rather as a workflow-oriented technology partner to the broadcast industry."

The steps we've taken in the last few years are the foundation for building an organization ready to lead broadcast customers into new media markets. I firmly believe that the breadth of our product offering, our enhanced customer relationships, the world-class sales model we are building, the great talent of our people and most importantly, our unique ability to deliver interoperable solutions across the workflow chain will make Harris the ONE undisputed, worldwide leader for the broadcast, distribution and entertainment industries. ■

A World of Multiples: The Simplicity of ONE

A digital broadcast infrastructure is a blessing and a challenge: a blessing because it opens multiple sources of new ad and subscription revenues. Non-linear advertising. Sponsorships. Downloads. A challenge because multiple service combinations such as HDTV, MobileTV and InternetTV introduce complexity and add costs.

The answer: go with the simplicity of ONE. One company that supports you along the entire broadcast chain, from ingest to transmission. One company that works with you to tie your business models, content and infrastructure cleanly and efficiently, so you can offer multiple services without multiple headaches.



Harris is the ONE company delivering interoperable workflow solutions across the entire broadcast delivery chain.

ONE Harris at NAB2007

At NAB2007, visitors to the Harris booth will find working representations of real-world workflows that mirror their own environments. The Harris stand this year is showcasing integrated workflow solutions that enable broadcasters to profit from new, multichannel services, get on air fast with high definition and effectively project their brand.

Business Operations: Leveraging the H-Class™ platform for interoperability across sales, traffic, scheduling and billing operations

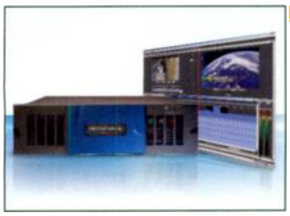
In the area of **Business Operations**, our OSi business/media software solutions will be a significant draw to the Harris stand. **OSi-Traffic™** is currently helping more than 550 call letter stations and a growing number of media networks manage their inventory better through the use of a single database, single executable and single-server platform — and tightly integrated with industry-leading ***H-Class*™ ADC™** and **D-Series™** automation solutions. Utilizing cutting-edge Windows®-based technology, unique research functionalities, and a single, centralized database, OSi-Traffic™ continues to set the standard for PC/Web-based traffic, sales and billing solutions.

***H-Class*™ Invenio™ Digital Asset Management**

H-Class™ Invenio™ Digital Asset Management provides automated metadata cataloging, rich search and automated content movement to unlock the value of your content. Customizable user interaction simplifies and enhances your workflow.

Media Management: Connecting Content to Revenue

For **Media Management** applications, our ***H-Class*™ Media Ingest** and ***H-Class*™ Invenio™ Digital Asset Management** systems provide customizable hardware and software solutions to automate the ingest, collection and cataloging of digital assets. By identifying and utilizing existing metadata, and offering a host of controls to dynamically add more detailed metadata during ingest, the Harris system provides any facility with the means to identify and locate the assets they need, exactly when they need them.



NewsForce™

NewsForce™ is a complete HD/SD newsroom solution providing comprehensive on-SAN editing options, including full integration of Apple® Final Cut Pro®, and delivering the quickest time-to-air.

Newsrooms & Editing: Editing to air faster in an end-to-end file-based workflow

For **Newsroom** environments, Harris is introducing **NewsForce™**, a complete, file-based newsroom solution built on the advanced **NEXIO XS™** shared-storage server architecture and featuring a new generation of Harris editors optimized for the fast cutting, voicing and airing of news. With servers, editors and Harris® **Inscriber®** graphics systems working directly on the NEXIO™ storage area network, NewsForce™ provides newscasters with a streamlined, MOS-enabled infrastructure for producing, processing, distributing and managing both SD and HD content.

Core Processing: Interoperable hybrid infrastructure — the glue that binds your workflow

In **Core Processing**, we are showcasing the cross-portfolio control of our **NUCLEUS™** control panel and **CCS Navigator™** control and monitoring application. We are also introducing advanced audio processing and 3Gb/s capability across the Harris signal processing and distribution products—including the **Platinum™** router — providing cost-effective, HD-compatible products supporting emerging standards such as 1080p. At NAB2007, Harris introduces **CENTRIO™**, a breakthrough multi-image processor based upon the Platinum router architecture. Uniquely capable of driving up to 32 independent DVI displays or 64 independent HD-SDI monitors, CENTRIO™ features a superior graphics engine that enables customizable image layouts.

CENTRIO™ Multi-Image Processor

Introducing CENTRIO™, a breakthrough multi-image processor that will transform the industry's multiviewer expectations. Combining an advanced multiviewer with the Harris Platinum™ broadcast router makes CENTRIO™ an undisputed breakthrough in design and value.

Channel Release: Integrating automation with master control and branding to deliver your on-air look with quality, flexibility and creativity

For **Channel Release** applications, the Harris *H-Class*™ ADC™ and D-Series™ are already the most widely deployed playout automation systems around the world. With our expanded portfolio and increased interoperability, we now tie our channel release capabilities — including the Icon™ series of master control and branding solutions — to our automation systems to provide the level of control needed in the multiservice, multiformat world. To improve the customer workflow, we've added new data-analysis parameters and file-correction tools to our **Videotek® QuiC™** media analysis server, which will enable customers to analyze files during ingest, correct certain file problems on the fly with no operator intervention and significantly improve efficiency.

Media Transport: Moving media faster, easier, cleaner — anywhere

In **Media Transport** for NAB2007, we are launching a suite of HDTV H.264 (MPEG-4 part 10) compression products for the **NetVX™** platform that will enable new applications and services by allowing lower-bandwidth operation of HD services over satellite, terrestrial and IPTV delivery platforms. We will also be demonstrating **Intraplex® NetXpress™** — an IP multiplexer that provides reliable transport of audio, video and data over IP.

Harris NetVX™ H.264 Encoders

Harris NetVX™ ENC-A11 and ENC-A21 SD and HD encoders respectively, leverage the H.264 (MPEG-4 Part 10/AVC) compression standard to enable new satellite, terrestrial and IPTV applications and services.

Harris ZX™ Tri-Mode FM Transmitters

Harris ZX™ transmitters, with 500-3500 watt power levels, offer a perfect HD Radio solution to small and mid-size stations and a full-featured back-up option to larger stations.

TV Transmission: Reliably leading into the digital future with the broadest line of transmitter solutions

Harris continues to offer the industry's broadest line of TV Transmission solutions, including ATSC and DVB-T transmitters, and a growing range of mobile TV solutions, including in-band ATSC, DVB-H, T-DMB and FLO. Products like the **Platinum-*i*™** VHF transmitter are designed to tie readily into the IT-enabled workflow, while our new ATSC mobile solutions enable new revenue models such as mobile TV to be brought into current infrastructure.

Radio Broadcast: Offering comprehensive, end-to-end digital radio solutions

The only company to provide HD Radio, DRM and DAB digital radio transmitters, Harris is uniquely able to offer proven solutions for new digital services. Expanding coverage and revenue capabilities are available with our unique **SynchroCast™** single frequency networking solution, as well as the multichannel broadcasting capabilities of HD Radio and DAB/T-DMB, the new **DataPlus™** datacasting solutions, and the whole range of end-to-end radio broadcast solutions.

Harris Assured Designs

In perhaps the ultimate demonstration of our cross-portfolio integration efforts, NAB2007 will see the launch of **Harris Assured Designs** — a series of cost-effective, fully integrated broadcast workflow systems designed to solve real-world business problems. Combining Harris best-in-class, field-proven HD/SD hardware and software, these pretested, preconfigured solutions ensure seamless implementation, rapid deployment and significant improvement in any broadcast operation's workflow efficiency.

BUSINESS OPERATIONS

How do I streamline my business operations?

How do I strengthen the interface between departments and systems?

How do I help my customers buy from the wide range of channels I program?

Define Future Success With Automated Business Solutions

The broadcast landscape is changing at a rapid rate — so rapid, in fact, that broadcasters may be hard-pressed to define their future business models. Whatever they may be, they're not likely to bear much resemblance to those of today.

But whether the future includes programming more channels on a digital broadcast signal, mobile TV, Internet offerings or other means, the business operations system must be able to grow and flex with the additional demands.

EXPERIENCE COUNTS

This is where Harris capitalizes on more than 45 years of broadcast business experience in **sales, scheduling, traffic and billing systems**. That experience includes extensive involvement in global markets, where targeted sales models and multichannel operations are often the norm. Harris business solutions are designed to fit the needs of their specific markets; feature the flexibility to grow as a broadcaster's needs expand, without growing payroll; and are all inherently capable of multistation, multichannel and multiplatform operations.

NORTH AMERICAN SALES MODELS

Programming not only the main broadcast channels, but also "dot" side channels and program streams to other devices gives a broadcaster's sales force the opportunity to sell from a broad menu. Harris® **OSi-Traffic™**, with its unique centralized database, allows stations, station groups and cable networks not only to sell targeted demographic marketing plans across multiple channels and media platforms, but also gives stations the consolidated information they need to properly manage those business models. When OSi-Traffic™ is integrated with Harris® **OSi-AdConnections™**, sales staff can immediately access or make changes to avails, packages, proposals and research information. In addition, OSi-Traffic™ real-time spot placement and reporting gives the sales force immediate inventory information, providing confidence that a spot sold is truly available.

INTERNATIONAL SALES MODELS

Global markets require systems that optimize inventory and revenue for impression-based demographic purchases. The ***H-Class*™ Landmark™ Airtime Sales** system not only optimizes inventory utilization for those types of media placements, but also tracks and manages campaigns for interactive, sponsorship, teleshopping, production and web combined deals. When *H-Class*™ Landmark™ Airtime Sales is paired with ***H-Class*™ Vision™ Scheduling**, media companies can define those services and manage their content at the event and component level, maximizing reuse and reducing costs in multiservice, multilanguage environments.

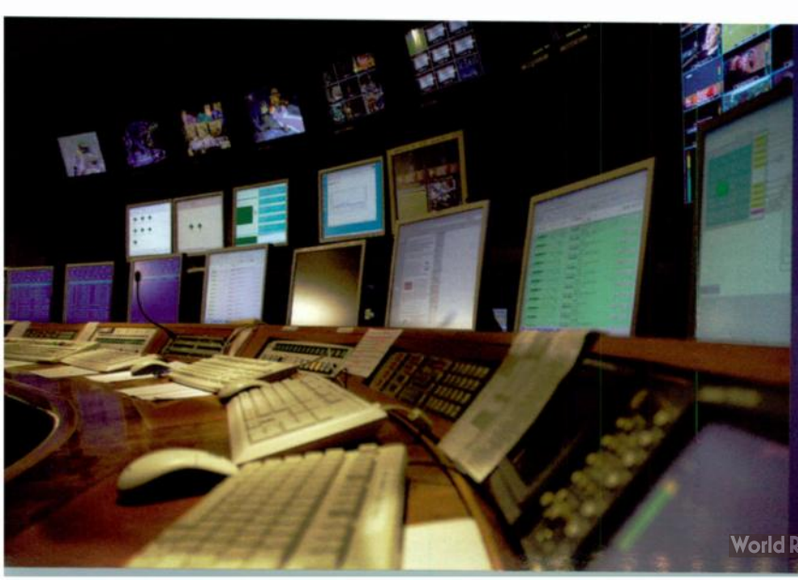
EMERGING INTERNATIONAL BROADCASTERS

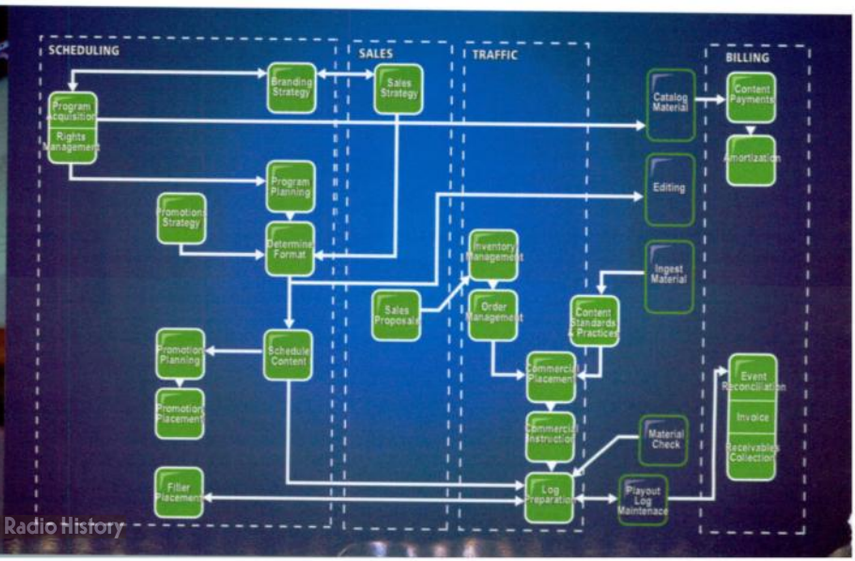
New technologies and the availability of bandwidth have globally lowered the barriers to entry for new channels and digital services. These new channels require tools that are easy to use and deploy. Success relies on a business system that provides the lowest start-up cost, maximum flexibility and the ability to grow and expand as the channel gains momentum. Harris **Broadcast Master™** is a complete, modular and scalable business system for the management of the planning and commercial processes of these broadcasters.

BUSINESS OPERATIONS INTEROPERABILITY

To maximize content revenue, broadcasters today must be able to quickly find content and track its preparation, usage and movement throughout their organizations with defined workflow processes. *H-Class*™ provides the tools to allow integration of metadata, and to define and automate data and content preparation workflows across the entire broadcast delivery chain. This integration allows media companies to reduce operating costs, enrich content usage and link their business, media asset, operations and distribution services.

Harris, an innovative leader in business system and automation technology backed by years of experience, offers the industry's best-in-class sales, scheduling, traffic, asset management and multichannel playout automation solutions for the new breed of emerging broadcast business models.





MEDIA MANAGEMENT

How do I keep my video content safe, easy to find and accessible?

How do I make it easy to get content into my system?

How do I grant access to my content automatically?

H-Class™ Digital Asset Management Connects Content to Revenue

Every day, broadcasters amass vast quantities of video, piled upon an ever-growing archive of footage. Negotiating an effective and efficient way through the video mire has always been a problem begging for a solution.

While media asset management has been around in some form for years, historically those systems relied heavily on personnel to manually ingest and catalog content.

The Harris® ***H-Class*™ Invenio™ Digital Asset Management** system is designed to automate many of the previously manual tasks that burdened those trying to accurately catalog video assets with metadata. By automating much of the process, the system provides users with an easy way to quickly identify, locate and receive the video they need. Improving access to the assets enables more complete utilization.

EFFICIENT WORKFLOWS

Leveraging the efficiency of digital workflows is a high priority. The *H-Class*™ Invenio™ Digital Asset Management system can be deployed with overriding content awareness and management responsibility. Content will be ingested once and made available to pre and post-production, as well as to Traffic and Play-out. Cohesion like this empowers efficient workflows, extends resources and maximizes profitability.

A good data management system has to accommodate many different needs. Harris has bypassed high customization costs by developing a wide range of interoperable hardware and software modules to fit any broadcast process, without the ususal associated expenses.

In addition, Harris' open architecture, device drivers and adherence to industry protocols make integration with other Harris devices and third-party equipment possible with minimal software customization.

AUTOMATED METADATA GENERATION

To get the most out of content, the DAM system needs to transcode video to the library format, carry existing metadata on the video along to the library, and support easy generation of new metadata for rich cataloging.

Harris network appliances — such as ***H-Class*™ Automatic Ingest** — take the guesswork out of the transcoding of video at ingest by automatically detecting the video format. The user simply tells the system in which format the video is to be saved, and the process is done, carrying the existing metadata along into the library.

RICH CATALOGING

The value of content can be unlocked by attaching metadata to the content frame level that allows targeted searches and quick access to relevant content segments. While this level of metadata could never efficiently be added via a keyboard, an array of Harris modules performs such functions as speech-to-text, closed-caption extraction and scene-change detection to automate the process of adding this metadata as the content is ingested. That metadata can be applied granularly down to a single video frame. And Harris' open architecture allows third-party applications performing operations such as face detection to be easily added to the workflow once they become available.

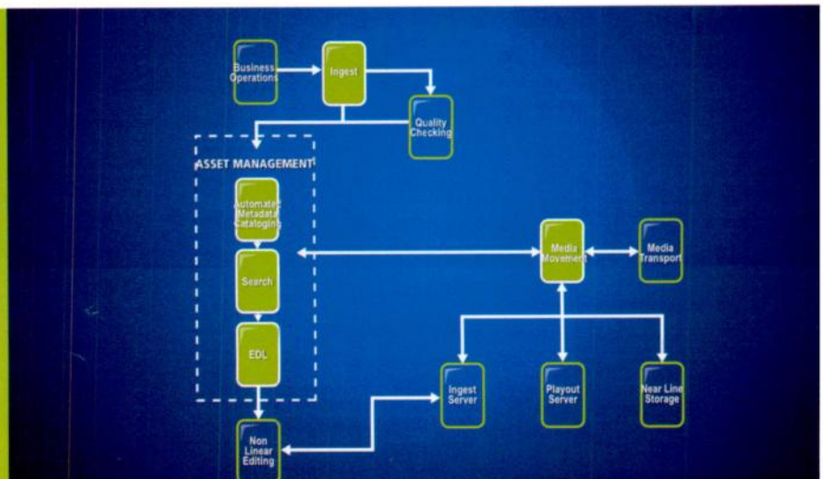
Where manual addition of metadata must be done, the *H-Class*™ Invenio™ Digital Asset Management system supports hot-keys to allow an operator to easily enter a commonly used metadata tag, or to flag the video for closer attention later. When a piece of content requires hands-on attention before going to the library, it can reside on the **Content Capture Server**, which has VTR-like functions to facilitate closer review and analysis.

To serve in-house content users, Harris media management systems can provide search capabilities directly from Harris or third-party edit stations.

ONE SOLUTION

Broadcasters have long perceived value in their video archives. Asset management is the key to unlocking that value, allowing content owners to find, manage and monetize their video material. With the Harris *H-Class*™ Invenio™ Digital Asset Management system, content is easily ingested, richly catalogued, securely protected and readily accessed — all without paying a high cost for customization or operation.

Asset Management is the key
to unlocking the value of broadcasters' video archives, allowing content owners to find, manage and monetize their video material.



NEWSROOMS AND EDITING

How do I get my journalists' news on the air better and faster?

How do I get more ROI out of my news operation?

How do I get more revenue from my news operation?

NewsForce™ Streamlines the Newsroom — And Gets You On Air Fast

Local news is the face of a broadcast station, its signature product. To compete, broadcasters are turning to high defintion in ever growing numbers. Incorporating HD technologies, of course, renders old-style edit equipment obsolete, so broadcasters are faced with migrating to this new paradigm in ways that won't affect the productivity of their newsroom — or impact their on-air product during the transition.

Harris tackles this challenge with its end-to-end **NewsForce™** file-based newsroom solution, capable of handling both SD and HD in a wide variety of compression schemes. A complete, format-transparent news platform, NewsForce™ can be integrated into station operations all at once or gradually, depending on a broadcaster's needs and wants. It runs on the Harris **NEXIO XS™** storage area network (SAN), which offers the highest levels of speed, power and flexibility. Because all NewsForce editing systems can reside on the NEXIO SAN, editors can take advantage of true shared storage and access the same video material.

GO WITH THE FLOW

For the station that is ready for file-based editing, NewsForce™ offers three next-generation news editors that leverage the speed and flexibility of the NEXIO SAN. The systems are built around the **Velocity™** nonlinear editing interface, and all can share projects and work simultaneously on incoming content, eliminating the need to transfer files between systems. The resulting workflow offers exceptionally fast completion to air.

- **NewsForce™** — high-resolution on-SAN news editor. Provides direct Fibre Channel access to shared storage and pointer-list playout technology to minimize time between content access and air.
- **NewsForce Desktop™** — multiple editors can browse and edit low-resolution clips right on their desktops and hi-res copies are automatically saved into the rundown for immediate play to air.
- **NewsForce XNG™** — software-based laptop editor allows journalists to edit on the go. Also connects to the SAN via Gigabit Ethernet and integrates with MOS-compliant newsroom computer systems.

GRAPHICALLY SPEAKING

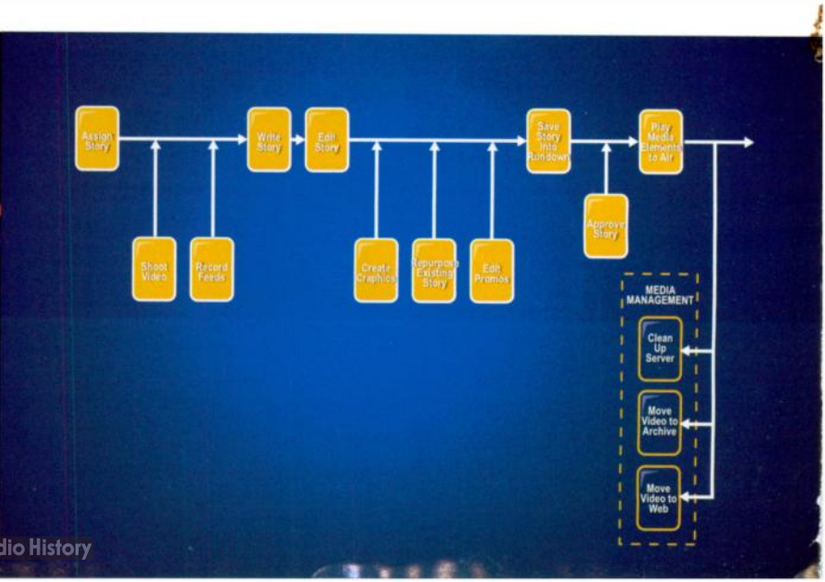
High-quality graphics have never been more important for defining a station's on-air brand, as well as for helping to explain complicated news stories. This in turn has prompted stations to put more control of news graphics into the hands of journalists. The Harris **Inscriber® G-Series™** graphics system integrates seamlessly with NewsForce™ and provides newscasts with dazzling, real-time over-the-shoulder, lower-third and full-page graphics. G-Series graphics systems provide a sophisticated character generator, sequencer, animation editor and media store database. And Harris' adherence to industry-standard protocols permits graphic material created on other popular platforms — such as Adobe® PhotoShop® and Adobe® After Effects® — to be easily imported into a G-Series system for on-air playback.

TIGHT INTEGRATION

The importance of using actual news footage in same-day promotion of upcoming stories has created the need for craft editing systems that can work alongside news editors. Harris responds to that requirement with Harris® **Velocity NX™**, a full-featured post-production suite with sophisticated graphics and effects capabilities. A Velocity NX edit station can simultaneously access the same raw news footage that is being edited at other NewsForce™ edit stations, speeding up newsroom productivity across multiple fronts.

The NewsForce architecture is designed to accommodate third-party technology. Case in point: NewsForce™ features full integration of Apple® Final Cut Pro® onto the NEXIO SAN. All FCP seats can directly edit NewsForce content, and multiple editors can work on the same material simultaneously — all without having to transfer files between devices. Harris has also imbedded its full NRCS toolset into FCP, creating a new world of opportunity for one of the industry's most popular editing systems.

Workflows are evolving to accommodate technology advances like high definition and file-based video. Broadcasters deploying Harris' powerful NewsForce newsroom platform are assured a clear and seamless path to integrating technology as it emerges — and benefit from unrivaled speed, flexibility, quality and efficiency.



CORE PROCESSING

How do I future-proof my facility's technical infrastructure?

How do I build a format flexible facility to keep up with all the changes?

How do I get consistent 5.1 audio out, even if my local commercial content is mono or stereo?

Core Processing With Harris Infrastructure: The Glue That Binds Your Broadcast Workflow

Broadcasters are well aware of the importance of their technical infrastructure. The broadcast facility's backbone is where all the content is filtered through the pipes — core processing: the equipment that routes, converts, performs tests on and displays video and audio signals so that the rest of the workflows have material to perform their functions. This equipment needs to be reliable, sturdy and long-lived — and provide avenues to accommodate format flexibility and technological advancement.

Broadcasters need look no further than Harris' suite of core processing devices —like **Platinum™** routers, **6800+™** and **NEO®** modular signal processors and **X75™** multipurpose converters and synchronizers — to acquire a robust, forward-looking workflow infrastructure for their operation. The Harris portfolio offers modular and standalone platforms that invite innovation and future expansion.

Harris' commitment to interoperable solutions powers tight integration and presents control, monitoring and diagnostic tools to centralize the operation of video and audio processing. The configurable **NUCLEUS™** control panel, **Q-SEE™** thumbnail technology and the revolutionary, router based **CENTRIO™** multiviewer together form a monitoring and control arsenal that centralizes and simplifies a workflow of any size.

IN FOR THE LONG HAUL

Core infrastructure equipment is bought for the long haul. Some of this equipment can be costly, and complex to install. So it's no surprise that broadcasters are quick to ask Harris two important questions when evaluating new routers and processors for their core infrastructure: How long will the system physically last, and how long will its useful life be? Broadcasters can look into Harris' past for one answer, and into the future for the other.

The staying power of core processing equipment from Harris is indisputable. Many broadcast facilities continue to operate using infrastructure developed more than a decade ago. It's solid and built to last. But Harris also designs its systems to keep pace with technology.

Broadcasters who buy core infrastructure equipment today must be assured that it can handle both of the HD and SD video formats currently in use — easily converting video from one format to another and managing the plethora of audio options. Harris provides that assurance in many ways, offering flexible, customizable solutions with value-added technology such as auto format-sensing, so that operators needn't worry about identifying the format of source material.

3Gb/s THROUGHPUT

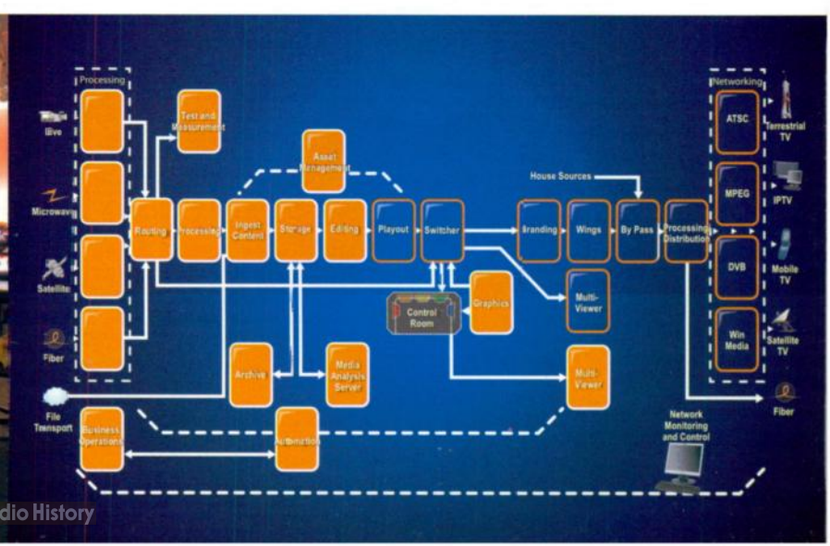
Not only do Harris products address the needs of today's formats, but they are also ready to accommodate future formats such as the emerging 1080p-50/59.94 frames per second video formats. This is accomplished by making 3Gb/s throughput standard in all Harris router and distribution products. The 1080p format — which as it emerges will be used initially for production purposes — is being considered as a broadcast standard for the future. By using Harris products, customers are equipped to handle any 1080p video that may come in-house, and stand prepared if and when it comes time to broadcast it.

UPMIXING TO FULL 5.1 SOUND

The Harris solution also addresses the multiple channel audio demands of broadcast HDTV. All of the company's core infrastructure systems are built to handle multiple channel audio, whether it be analog, digital embedded or Dolby® E or Dolby® Digital (AC-3).

The audio capabilities don't stop there. Harris has also responded to the increasingly common phenomenon of viewer dissatisfaction with "inconsistent audio." As more viewers install 5.1 surround sound systems, they have begun to notice — and complain about —the jarring difference between the full 5.1 sound from a network prime-time program and the mono or stereo of a local commercial or promo. Harris has partnered with Neural Audio to provide audio technology that smoothes the sound experience for the viewer by delivering a consistent 5.1 audio output, whether the content was mastered that way or upmixed from monaural or two-channel stereo.

Harris core processing infrastructure is an integral part of facility operations, performing all the background tasks essential to the successful operation of a broadcast facility today, with an eye toward the future. More importantly, the Harris commitment is to provide more than just products that work well — our products create integrated solutions that work well together.



CHANNEL RELEASE

How do I update my playout system without breaking the budget?

How do I connect my playout center to my traffic and billing systems?

How do I protect my brand no matter how my content is delivered?

Project Your Brand With Efficiency and Creativity

Functionality and Scalability Play Key Roles

Television's master control operation has evolved from simply switching between video sources into "channel presentation" — a complex combination of video, branding and localized information. Broadcasters now require flexible, modular channel release systems to deliver high-impact channels reliably, easily and efficiently.

Harris® channel release solutions start with master control and branding products, extend into playout automation systems and incorporate a wide range of digital file management solutions including servers and digital asset management. Harris channel release solutions reach even further, providing interoperability with other business systems such as scheduling and traffic.

MASTER CONTROL AND BRANDING

The Harris® **Icon™** series of master control and branding products offers options for both SD and HD channels, and manual or automated operation to cover the needs of any facility. Their modular design allows them to be reconfigured as a station's needs grow. For example, an **IconLogo™** branding solution can be upgraded to the **IconMaster™** master control switcher with multilayer branding functions.

The Icon family leverages world-class Harris® **Inscriber®** graphics technology to provide template-driven channel playout, unlimited layering and multilevel animation/still insertion, squeeze and teases and introduction promotions. With Icon graphics, a station can differentiate its on-screen presentation from its competitors, and keep a competitive edge as new on-air look features are added to the readily upgraded Icon line.

AUTOMATION

Today more broadcasters turn to the most widely deployed automation products in the world, ***H-Class™* D-Series™** and ***H-Class™* ADC™**, each now offering extended capabilities as part of the *H-Class™* platform.

H-Class™ D-Series automation is designed for broadcasters who may need to scale to large, complex channel deployments that can be operated with minimal operator support. Additional channels can be added for extensive linear scalability at a low, incremental cost per channel. Brand and revenue protection is provided by schedule synchronization between primary and backup sites.

The *H-Class™* D-Series Linux® operation system supports emerging alternative content distribution models, and provides tight integration to the Harris® **NEXIO™** storage solutions. Additional integration with asset management provides advanced media handling tools and access to an extended range of storage devices for functions such as media ingest.

Through Windows® and TCP/IP, *H-Class™* ADC™ is ideal for broadcasters seeking an easily deployable, quickly operational, easy-to-use system with a rich and growing library of device drivers. *H-Class™* ADC™ offers proven integration with Harris broadcast equipment and allows for richer branding without production overhead. *H-Class™* ADC™ extends its cost-effectiveness through storage and playout from NEXIO™ and **Isilon®** solutions, and compressed domain channel expansion and branding using the **Digital Turnaround Processor (DTP™)**.

Harris automation systems adhere to open architecture and industry standards, assuring compatibility with other vendors' products, including servers, routers, satellite receivers, graphics devices and signal processing equipment.

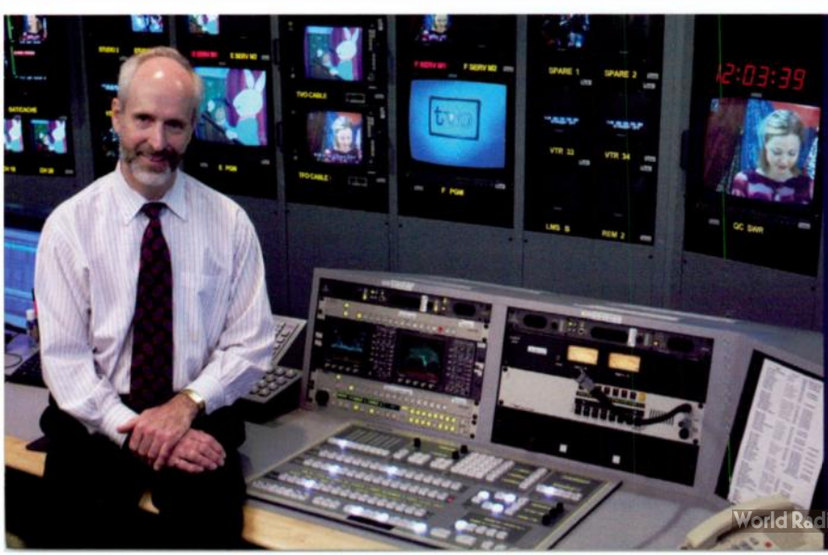
AUTOMATED MEDIA INGEST

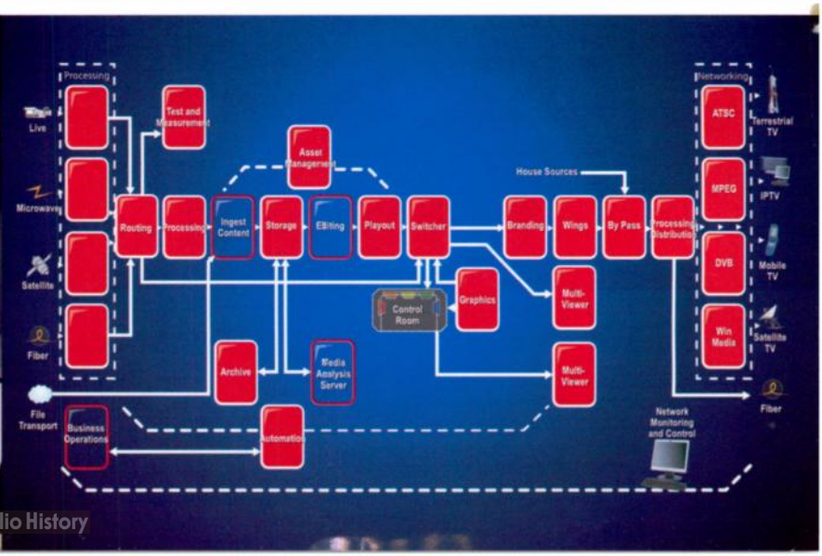
***H-Class™* Automatic Ingest** brings new efficiency to the job of ingesting content and preparing it for channel playout. Designed for interoperability and open standard support, *H-Class™* Automatic Ingest interfaces to all major digital content distribution systems — DG systems, Fast Channel, Media DVX, Pathfire and Vyvx — importing all timing and content metadata from these servers.

BUSINESS OPERATIONS CONNECTION

When a broadcast facility operates both Harris traffic and playout automation systems, the integration of the two workflows enables channel release to communicate back and forth along a station's infrastructure. Playout instructions are taken from the traffic system, and the as-played information is automatically confirmed back to traffic so that invoices can be issued.

Harris' modular, building-block approach to its traffic, automation, master control and graphics systems allows customers to realize full channel release at their own pace— acquiring what they need, when they need it — secure in the knowledge that their Harris channel release system can grow with their business.





MEDIA TRANSPORT

How can I securely move content within and between my facilities?

How can I manage the transport of my content so it's easy and format flexible?

Move Your Media Faster, Easier—Anywhere

Gone are the days of producing just one channel. New business models sprout new channels and variations of existing channels for new outlets, leading to a blizzard of video and audio coming in, shuttling about, and being distributed from today's broadcast facility. Broadcasters face the challenge of building an infrastructure that fits within their budget, can be operated by the current staff, and has a modular architecture that allows for further expansion as needs change over time.

Harris' modular approach to video processing and distribution also applies to networking and transport. Modular platforms such as the **NetVX™** video networking system and **NetXpress™** IP audio transport platform allow a facility to be designed to satisfy today's needs, but with the flexibility to adapt to future requirements. With the right combination of video, audio and data interfaces — including the ability to control and be controlled by other elements of the plant infrastructure — NetVX™ and NetXpress™ solve the whole multi-facility networking puzzle.

FORMAT FLEXIBILITY

Handling video today has become an alphabet soup of encoding schemes, including HD and SD, MPEG2 and H.264, as well as file-based formats. The old ways of dedicated single-purpose paths simply won't work. What is required is a flexible networking fabric that enables seamless, simultaneous transport of all these formats via landline, satellite, microwave, ATM or IP networks. What is needed is the NetVX modular video networking system.

Harris also provides a broad range of data, voice and audio transport solutions through its NetXpress platform, enabling broadcasters to transport services on T1, E1 and IP infrastructures and bridge legacy infrastructures into modern networks. Harris advanced echo cancellation makes its solutions ideal for remote venues or just plain voice communications over IP networks.

PRIORITY TREATMENT

Some of the video a facility needs to move is high priority — in real time — such as a network's prime-time schedule or live sports. The program comes in, flows through the facility and out to the viewers in just milliseconds.

Other video is less urgent, if no less important, such as syndicated programming going into a library, or commercials that don't air until after the weekend. This video can be sent across a video network in file-based formats, as the network's traffic allows.

Using different priorities to drive the technical operation enables a significant increase in efficiency. The Harris networking system prioritizes video delivery, both real-time and file-based, so that content is transported to its destination on time, and using the most cost-effective method.

DIGITAL TURNAROUND

Harris modular video networking solutions offer real-time encoding and networking, but equally important, these solutions provide compressed-domain manipulation technologies including splicing, rate-shaping and even graphic insertion.

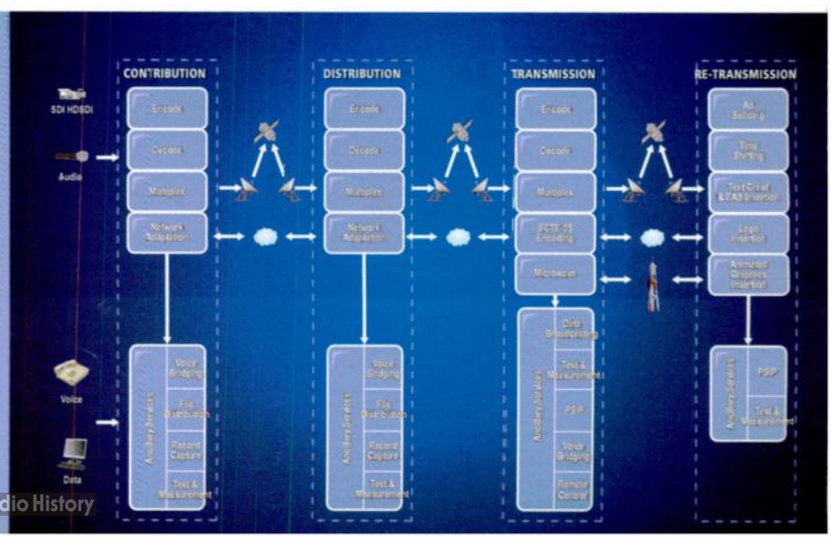
Through the Harris® **Digital Turnaround Processor (DTP™)** product family, compressed signals can be manipulated, spliced together, and have graphics or crawls added, all while remaining in the compressed domain. This allows for localized EAS messaging, localized advertising solutions, program substitution, and other local and regional content specialization.

MEDIA ANALYSIS

With file-based content, until the whole file has been transmitted and received, it can't be viewed in traditional fashion. To assure that incoming files meet quality control standards, Harris recently introduced the Videotek® **QuiC™** media analysis server. The QuiC™ system evaluates the quality of the encoded signal during ingest — at speeds faster than real time — and is part of a family of test and measurement tools developed for the media transport infrastructure of tomorrow.

Broadcasters can trust that, as they are faced with shuttling more and more video in more and more formats, the Harris system they install today can meet all their needs – for now and for the future.

With the right combination of video, audio and data interfaces — including the ability to control and be controlled by other elements of the plant infrastructure — NetVX™ and NetXpress™ solve the whole multi-facility networking puzzle.



TRANSMISSION

How do I buy a transmitter that can grow with my future needs?

How do I distribute my own mobile TV service?

TV and Radio Transmitters Built for the Future

Investing in a transmitter is a long-term proposition for television and radio broadcasters. They need to be assured that the transmitters they choose will not only operate reliably for many years, but also adapt readily to changing business models, including the transition to digital and mobile TV. No company in the world offers a broader line of radio and television transmitter solutions than Harris.

Around the world, Harris continues to lead in helping local television broadcasters and network operators implement transmission solutions, including ATSC, DVB-T and all the major approaches to broadcast mobile TV, including in-band ATSC, DVB-H, FLO and T-DMB.

For digital radio, Harris offers proven solutions for HD-Radio, DAB and DRM approaches to digital transmission, in addition to a full range of solutions for digital audio content creation and management.

Harris takes a global approach in its transmitter design, exemplified by its **Atlas™** liquid-cooled UHF transmitters, which offer analog and digital versions so customers may easily implement analog transmitters today and readily upgrade to digital transmission in the future.

THE NETWORKED TRANSMITTER

Harris pioneered the development of the TV transmitter as a device that can be managed over the broadcaster's IT network. For high power ATSC UHF applications requiring the latest in high-efficiency transmitter designs, the **PowerCD™** was the first Harris TV transmitter designed from the ground up for networked remote control and monitoring. The new **Platinum-*i*™** transmitter for VHF applications is the latest Harris transmitter designed for network control.

This tight integration with the station IT infrastructure becomes increasingly important as station groups explore new business models such as regional casting and centralcasting.

IN-BAND AND DEDICATED MOBILE TV SOLUTIONS

Harris has led the way in mobile TV solutions, employing its **DVB-H** transmitter families to offer both mobile TV as an in-band service with digital terrestrial transmissions and as dedicated mobile TV services. Now, in addition to DVB-H and **MediaFLO™** solutions at UHF and L-Band, and video-over-DAB solutions at VHF and L-Band, Harris is pioneering a compatible system for in-band ATSC mobile TV broadcasts.

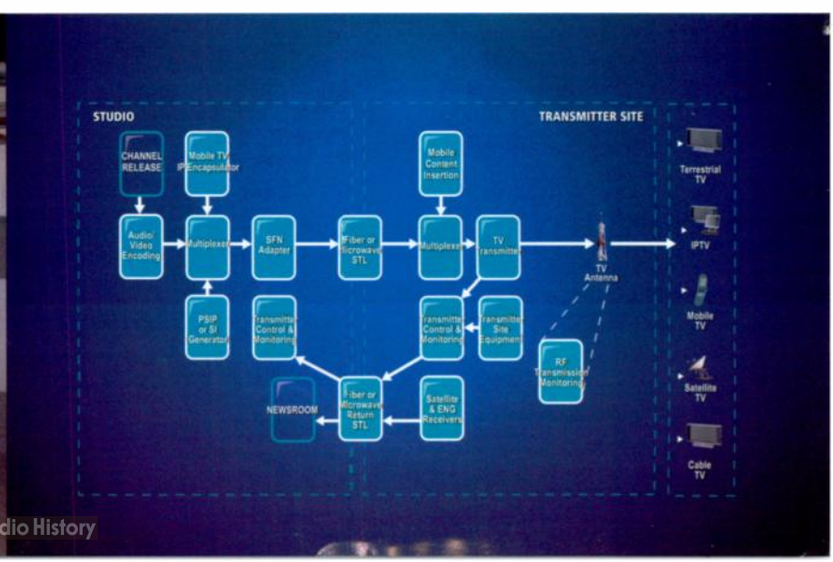
By making it possible for local broadcasters to transmit mobile channels within the bandwidth of its digital signal, Harris is making it easier for broadcasters to participate in the exciting new audience and revenue possibilities of mobile TV.

DIGITAL RADIO SOLUTIONS

Digital Radio is a driving force for radio in many parts of the world. Harris offers the industry's widest range of digital solutions, including DAB, DRM and HD Radio, along with its audio console, audio networking solutions and analog radio transmitter products.

One example of Harris flexible solutions for radio transmission is the ZX™ line of transmitters. Powered by the award-winning FlexStar™ HDX FM/HD exciter for **TRI-MODE** operation, the ZX line can permit switching between digital, analog and hybrid modes on the fly. Low-power broadcasters wanting to deliver HD Radio can utilize the ZX3500 transmitter, designed for multicasting at low power. The ZX™ features an optional **WEB Remote** that supports network-based control and monitoring via SNMP and browser-based GUI.

As the world's leading supplier of television and radio broadcast transmitters, Harris continues to be in the forefront, developing the transmission products and systems needed to lead broadcasters into the digital future, with effective solutions for all major digital radio, TV and mobile TV standards.



IPTV

How do I deliver the best IPTV video quality and gain interoperability throughout my signal chain?

How do I get my IPTV service on the air fast with the ability to expand when I need to?

How do I build an advertising-based revenue stream?

Harris Provides IPTV Headend Solution and Puts the 'TV' in IPTV

Every second of the day, in the Americas alone, Harris infrastructure products are delivering more than 1,500 channels of video. Every year, Harris systems transact more than $29 billion in ad revenue. This track record demonstrates that Harris knows the video business — and how to put the TV in IPTV.

Today's killer application for IPTV is TV. Harris can help IPTV operators build high-quality, high-efficiency headend infrastructures to get their channels on air. From that beginning, Harris can be a partner as operators grow their subscriber base through branding and self-promotion, and as they automate their workflow and lower OPEX. As operators add new sources of content and revenue, Harris provides the IPTV and mobile TV infrastructure for "going local" and "going mobile" with both content and ads.

Harris brings premium video test, monitoring, processing, transport, storage and distribution technologies to the job of building IPTV services, whether those services are launched by international telecommunication giants, broadcasters or Internet entrepreneurs.

The **NetVX™** video platform, for example, can provide an integrated signal workflow — including video networking and multiplexing — for a range of applications. Harris also stands at the forefront of new compression technologies, such as MPEG-4 Part 10 (H.264), which promises greater bandwidth efficiencies through existing fiber, cable and DSL lines. The new H.264 capability in the Harris **Digital Turnaround Processor (DTP™)** allows operators to manipulate content, add graphics and splice compressed video bitstreams, reducing the need for more decoding/re-encoding steps in the signal chain.

To further ease interoperability, Harris has developed a set of IPTV ecosystem partners who provide middleware, CAS/DRM, VoD servers and set-top boxes. Customers can be confident that Harris IPTV headend systems will easily operate within an IPTV end-to-end infrastructure.

Harris has the headend equipment and knows the business of IPTV. IPTV operators who build their end-to-end systems in partnership with Harris gain the leverage of an industry leader with solid video signal and workflow experience and expertise in the latest compression technology.

IPTV

GOVERNMENT

How do I collect and distribute video and other sensor data efficiently?

How do I sift through massive amounts of video quickly?

How do I keep track of all the video being collected?

Harris Technology Tackles Government Video

Harris offers platforms for Tactical Surveillance, Video Networking, Geospatial Digital Asset Management and Newsroom Production

National Defense and Homeland Security requirements have spawned an avalanche of video material for government use in the intelligence, military and civilian law enforcement communities. Thousands of unmanned video surveillance flight vehicles, video cameras on fighting machines and imagers on towers recording 24/7 are accumulating millions of hours of video.

These government entities face the challenge of collecting, storing, cataloging, transporting and easily retrieving and repurposing that material when needed.

Harris provides the entire infrastructure for the collection, management and distribution of rich media assets for government clients such as the Department of Homeland Security, the U.S. military, the CIA and the FBI, and government broadcast agencies. Much of that infrastructure has been adapted from technology first developed for the commercial television industry, where Harris is the clear technology and market leader.

Among the Harris technology modules of particular interest to government video users are the **NetXpress™ Tactical Surveillance** platform, **NetVX™ Video Networking** platform and **GDAM Geospatial Digital Asset Management** system, which has the ability to search video files by specific time and place parameters. This simplifies locating time- and location-specific video shot by cameras with integrated GPS devices that encode precise site and date/time information directly into the video as metadata. These platforms speed the process of collection, management and dissemination of critical information for security or news purposes. Our solutions also include one of the most advanced newsroom solutions in the industry, allowing government agencies to edit and produce news and briefings in a near real-time environment.

Government agencies, already well aware of Harris' reputation as a major government contractor in the communications field, draw on Harris' vast expertise in video technology to quickly secure effective solutions that satisfy their most stringent video requirements.

GOVERNMENT

HOW DID WE GET HERE?

The Harris® ONE initiative is a carefully honed company concept borne of years of experience and commitment to its customers — a natural progression for a progressive company.

Harris Corporation is no newcomer to the broadcast radio and television business, having entered it with the 1957 acquisition of Gates Radio and the 1972 purchase of General Electric's product line of TV broadcasting cameras, transmitters, studio equipment and antennas.

OUT OF THE BLACK BOX

In those earlier days of television and radio, the infrastructure was comprised solely of hardware, the ubiquitous "black boxes" of broadcast. The computer boom soon changed all that. Devices no longer necessarily required a dedicated operator. They assumed a new level of automation. They began to interoperate with one another. Or at least that's the way it looked in the block diagram drawings.

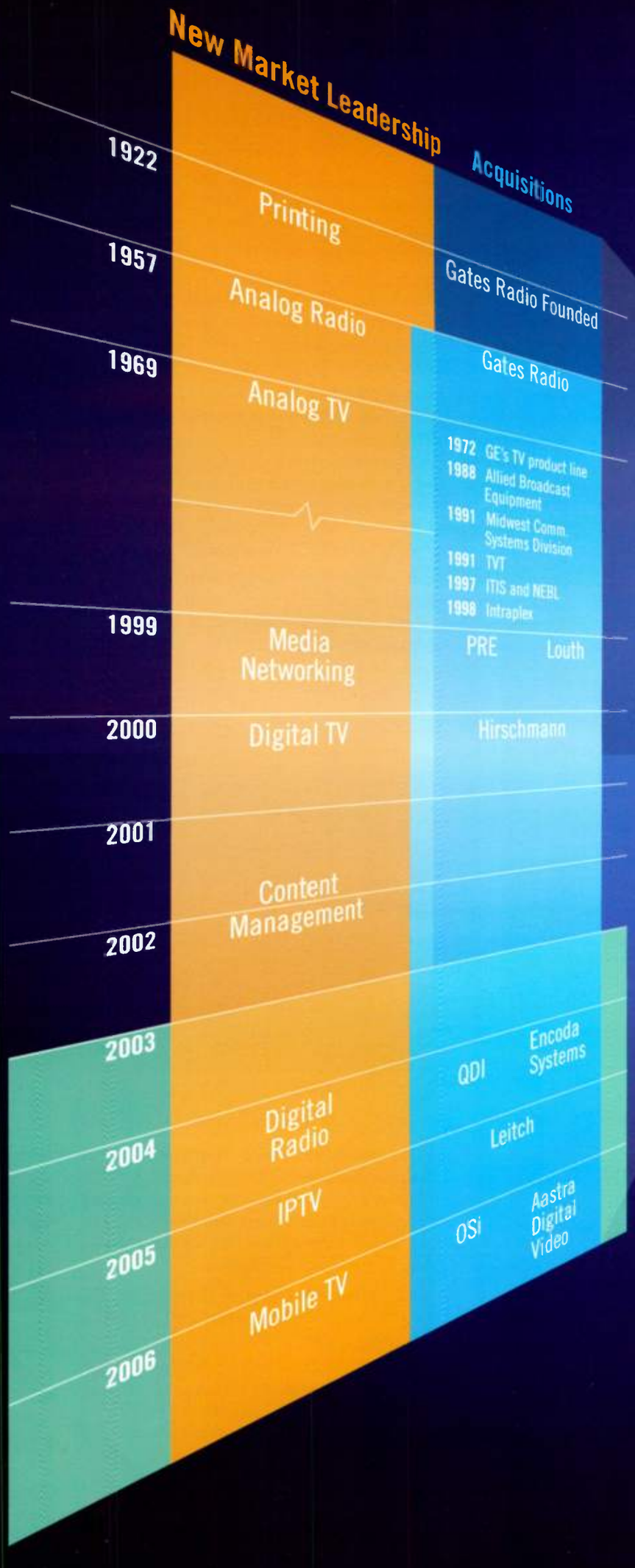
The hard reality was that broadcasters who wanted to make Company A's device interoperate with Company B's device often found themselves hiring Company C to write expensive software to connect the two. Upgrade a piece of hardware, and a broadcaster had to start all over again.

MAKING IT WORK

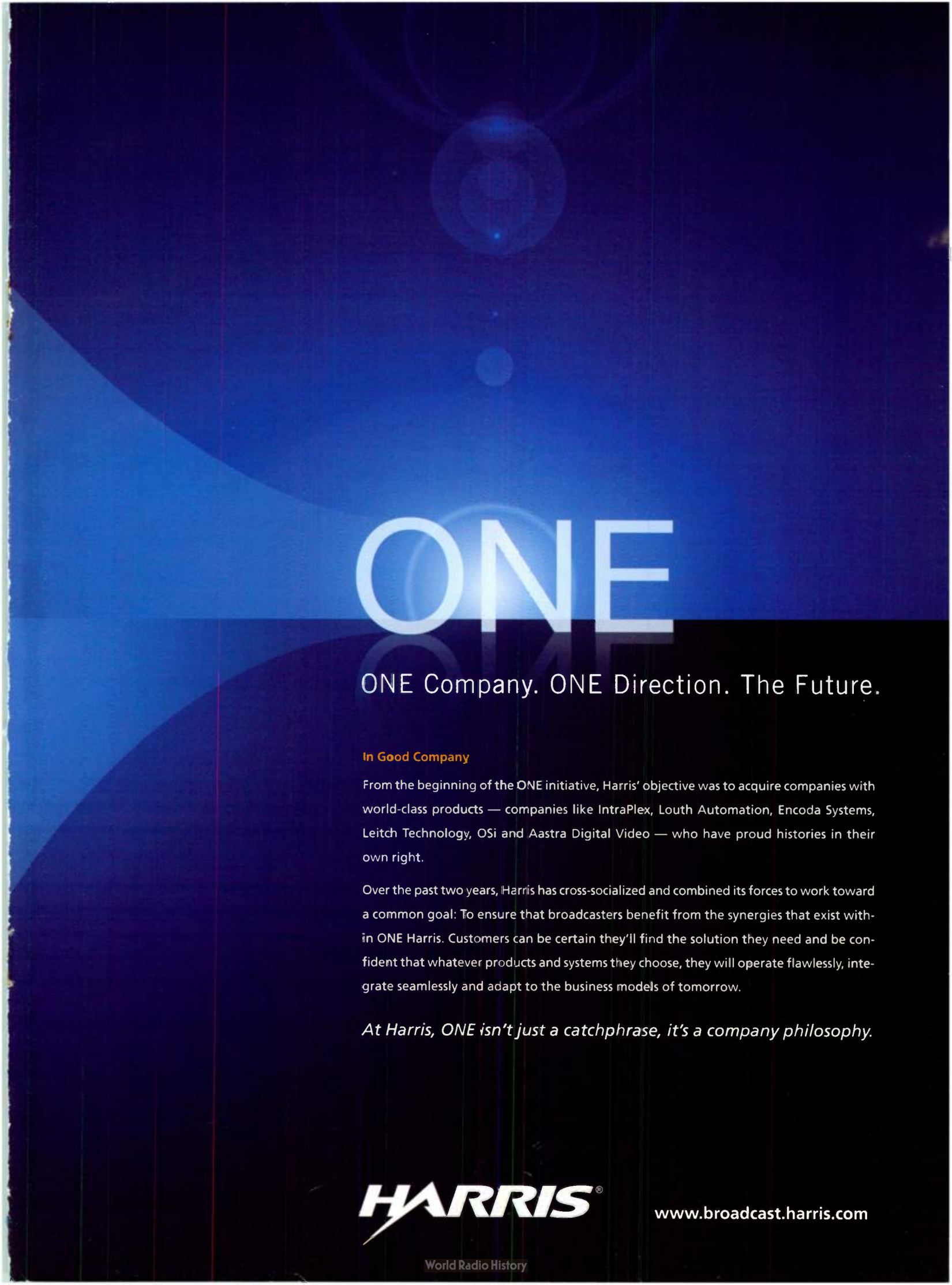
With the ONE initiative, Harris has committed to taking true, out-of-the-box interoperability from the status of a pipedream to an operational reality. Harris is uniquely positioned to accomplish this goal: No other company can match the power of its hardware and software engineering expertise, nor its financial strength to successfully execute the ONE strategy.

To reach this goal, Harris needed control of key devices in the broadcast infrastructure in order to manage their interoperability and develop total workflow solutions. Toward that end, Harris committed millions to strategic acquisitions.

In a relatively short time, Harris was able to identify, negotiate with and acquire companies whose products — and the engineering brainpower behind them — filled the needs of ONE solid, interoperable broadcast infrastructure.



Over $800M Invested Since 2003



ONE Company. ONE Direction. The Future.

Transition. Migration. Evolution. In the broadcast industry, change is everywhere and happening fast. Harris Corporation is the ONE company with the breadth of technologies and depth of experience to help you leverage every opportunity the future brings. ONE company delivering true interoperability across our portfolio—and across *your* broadcast delivery workflow.

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The Magic is in the Cards

Blackmagic Design adds HDMI capability to video processing hardware

by Claudia Kienzle

MILPITAS, CALIF.

In its seven years in business, Blackmagic Design has tracked right along with the key trends in the broadcast and post production industries. The company's high-quality, low-cost video cards and converters are enabling price-conscious video professionals to produce high-quality video productions and do video editing, broadcast design, and visual effects in 10-bit, uncompressed, real-time SD, HD, or 2K resolutions.

"With our products, we've been striving to put creative control into the hands of artists, and to make products of uncompromised quality affordable," said Grant Petty, CEO of Blackmagic Design. Petty's company started out developing software for third-party video cards and converters, but soon after decided instead to invest millions of dollars to establish a manufacturing plant where they could control the quality, stability, and cost of their own hardware products.

INTELLIGENT DESIGN

Petty founded Blackmagic Design to solve many of the problems he witnessed while working as a video engineer at post houses in Singapore in the 1990s. At the time, he was appalled at the expensive price tags and service contracts associated with the high-end editing and graphics solutions, and felt there was a better way to engineer these products that wouldn't compromise image quality, while promoting greater productivity and cost-efficiency for all video professionals.

"Today we have low-cost cards and converters, many of which are under $300, that enable Windows and Mac PCs running software from companies like Apple and Adobe to perform as well or better than half-million dollar editing and effects workstations on the market," Petty said. "We work very closely with Apple, Adobe, and other developers to ensure that our cards and converters work seamlessly with their software and offer the best possible user experience."

At NAB, Blackmagic Design will be showing many of its products at its booth, including Intensity, Multibridge Extreme, and the DeckLink family of video cards.

REINVENTING HDMI

Blackmagic Design's top of the line product, Multibridge Extreme, is designed for post production, editing, effects, and design. It supports HD/SD video, with full resolution real-time 2K playback when used with a 30-inch LCD display. Also, it supports 8 channels of AES audio, enough for 7.1

Grant Petty, CEO of Blackmagic Design

surround sound—or 12 channels of audio (via SDI) when used in conjunction with a 12-channel Sony HDCAM SR deck.

Multibridge Extreme features an external breakout box form factor that connects to the computer via a PCI Express cable and card. It ships with drivers for editing software, such as Apple Final Cut Pro, Adobe Premiere Pro, and Adobe After Effects and Photoshop software, among others.

Multibridge Extreme also includes a software tool called "On-Air" that offers a low-cost, real-time HD-SDI mixing console for switching between multiple HD-SDI-quality cameras with 10-bit uncompressed HD video, as well as direct recording to disk, graphics keying, genlock outputs, and full HD camera monitoring.

The product line also includes DeckLink HD Extreme, a HD/SD switchable broadcast video card with analog component and HD/SD-SDI connections, as well as the Intensity PCI card, which enables HD editing using HDMI.

The HDMI connection found on HDV cameras and the new Sony Playstation 3 allows consumer products to move from analog component connections to digital connections in full resolution HD. Blackmagic Design's Intensity card allows HDMI video to be captured onto a Mac or Windows workstation for editing at very high quality.

"While HDMI technology was devised to connect devices, such as cameras, flat-panel displays, and DVD players, we recognized early on that that same HDMI connector on the camera could also be used to capture the video coming out of the HDV camcorder as uncompressed 10-bit HD video," said Petty.

> "Our hardware can support any software application, provided that the vendors want to take advantage of the opportunity."
>
> —Grant Petty, Blackmagic Design

If you factor in the advent of 64-bit multicore processing workstations, Blackmagic Design's users are seeing a performance boost from the 64-bit workstation's unlimited working memory and multi-threading of applications and tasks. Blackmagic cards and converters, which are already 64-bit compliant, also work in a complementary fashion with 64-bit graphics processors from Nvidia and AMD/ATI.

Blackmagic Design products supported Microsoft's new Vista OS as soon as it was released, and also support Apple's Mac OS X Tiger and Leopard, all of which are 64-bit OS. Their cards and converters can move between the Mac and Windows environment with little trouble for greater flexibility.

"Our hardware can support any software application, provided that the vendors want to take advantage of the opportunity. But it's very difficult for vendors of high-ticket, closed solutions to abandon selling their software for $100,000 [to] up to a half million dollars in favor of the low-cost, desktop pricing model," Petty said.

Petty estimates that 50 percent of his business is in the broadcast sector, with over 10,000 broadcast seats among its worldwide customer base, many of which place high-volume orders for their cards and converters for their HD-quality broadcast design, live graphics creation, program editing, and mobile video trucks. The other 50 percent is in post production, with customers ranging from independent artists and filmmakers to high-end facilities. ■

NAB Honors 'Roots' Executive Producer David Wolper

LAS VEGAS

Marking the 30th anniversary of the monumental mini-series "Roots," NAB will honor David L. Wolper, executive producer of the 12-hour epic with the NAB Distinguished Service Award during NAB2007 in Las Vegas.

In Wolper's 50 years in show business, he has made over 700 films that have won more than 150 awards, including two Oscars, 50 Emmys, seven Golden Globes and five Peabodys. In addition to "Roots", the milestone story of several generations of a slave family, Wolper's collection of work includes "The Thorn Birds," "North and South," "L.A. Confidential," and the 1971 version of "Willy Wonka & the Chocolate Factory."

David Wolper

"David Wolper is one of America's most successful and influential television producers," said NAB President and CEO David K. Rehr. "'Roots' is 30 years old this year and is recognized as a seminal event in the history of mass media. We are honored to recognize him for his contributions to broadcasting."

The NAB Distinguished Service Award recognizes broadcasters each year who have made significant and lasting contributions to the broadcasting industry. Previous winners include Cokie Roberts, Edward R. Murrow, Bob Hope and Walter Cronkite.

Wolper has also been awarded the Jean Hersholt Humanitarian Oscar from the Academy of Motion Picture Arts and Sciences and was inducted into the Television Hall of Fame by the Academy of Television Arts and Sciences. He also holds the Legion of Honor, France's highest civilian honor.

Tawil

CONTINUED FROM PAGE 1

association comprised of commercial and public television stations, dedicated to preserving and enhancing the technical quality of television broadcast signals.

MSTV played a pivotal role in the introduction of DTV in the United States, testing of the Grand Alliance system, and the development of the DTV Table of Allotments. Today, MSTV is focused on new challenges, such as the possible introduction of unlicensed devices that will use the white spaces in the broadcast TV band.

"Once we complete the transition, you'll see a lot of battery-operated DTV sets with smaller, flatter screens."

In the following interview TV Technology's talks with Victor about the challenges that lie ahead for broadcasters during the final two years of the DTV transition, and what MSTV will focus on once the transition is completed.

TV TECHNOLOGY: What are your goals for MSTV?

TAWIL: I was hired by MSTV 20 years ago to help implement a new advanced television service in the United States My goal is to finish this job. Those 20 years were full of challenges, accomplishments, and yes disappointments, but we accomplished a lot. Also, digital technology offers many opportunities for broadcasters and consumers, and I hope to help cement those new opportunities for our industry.

TV TECHNOLOGY: Why is the issue of unlicensed devices, using the white spaces in the broadcast spectrum such a pressing problem, and what are the ramifications for the TV industry if it is not resolved properly?

TAWIL: The white spaces issue is the most pressing interference issue our industry is facing since its inception. The best way to prevent interference in the TV band is not to introduce them in the TV band. However, if they are introduced, we have to make sure they do not cause interference with the incumbent users in these bands.

As to the ramifications, they are serious. Remember, interference from these devices is caused to television receivers, not broadcast transmitters. OTA viewers are the ones that will be affected.

The interference issue is not only a pretransition issue. In fact, the interference is even more problematic after the transition, since, unlike analog, where interference to an analog picture means a gradual degradation in the quality of the picture and sound, interference in the digital world means a total loss of the picture and sound.

The most serious interference case is, if the commission allows operation of personal portable devices in the TV bands. Proliferation of these "any place, anywhere" UDs poses a real interference risk to television and wireless mic reception.

TV TECHNOLOGY: What is MSTV advocating be done to solve the UD problem?

TAWIL: Allowing use of the white spaces for rural broadband service is the most practical, equitable, and sound public policy decision. This is because spectrum is readily available in rural areas and the need for broadband services is the greatest. It is the least disruptive solution for primary users of that band.

Specifically, we are proposing that the FCC only allow fixed broadband devices in the TV band—and by that we mean base stations and point-to-multipoint systems which would be used in a specific location, and so we would always know where they are operating. Next, we have to make sure these devices are properly installed, so they don't cause interference to TV reception.

It would also be beneficial to make sure these devices are licensed. You could license it to an operator, such as a wireless network provider, that would know where his customers are and their range of reception. So, if interference occurred, we could track down the source of the problem."

TV TECHNOLOGY: At a time when 75 percent of the U.S. population receives television via cable or satellite services (and increasingly, the Internet), why is it important for this nation to continue to provide OTA television?

TAWIL: We believe that OTA TV is the most effective way to entertain, educate and inform the public. It's also important because it's ubiquitous, local, and free. The only thing you have to do is to buy a TV set and turn it on. OTA television doesn't require signing up for a cable or satellite service. It is always there and guess what? It is "wireless."

And DTV will offer more programming choices free to the consumers.

OTA TV also provides the most direct and effective means of informing the public during national security and severe weather emergencies.

Even if the power goes out, there are TVs that can operate with batteries, and once we complete the transition, you'll see a lot of battery-operated DTV sets with smaller, flatter screens. So our job is to reacquaint the public with OTA television, and the latest ATSC technologies that potentially enable mobile transmission.

TV TECHNOLOGY: What challenges do we still face as an industry to ensure that all segments of the U.S. population can receive DTV economically over-the-air? What solutions are being implemented to guarantee free TV for all?

TAWIL: When we finally shut down analog stations on Feb. 17, 2009, we have to make sure that every OTA viewer has a digital-to-analog converter to enable their analog television sets to receive the digital signal.

The government's voucher program, to help off-set the cost of the converter, is a step in the right direction.

With the NAB, we co-funded development of a prototype D/A converter box and that effort was completed last year. Our goal was to develop a prototype that would be easy to install and use. The prototype we demonstrated could serve as a guide for manufacturers to build to.

We are pleased that the NTIA [National Telecommunications and Information Association] recently adopted most of the technical attributes, performance specs, and functionality of this prototype for their converter box program. The NTIA, which is a division of the U.S. Commerce Department, is in charge of running the subsidy program for the OTA converter boxes.

TV TECHNOLOGY: What are the biggest challenges that broadcasters still face with respect to having a smooth shut-off of analog stations on Feb. 17, 2009?

TAWIL: One of the biggest challenges that broadcasters face is educating the public about the DTV transition. Also, it's imperative that we as an industry be able to complete the buildout and conversion of our facilities to operate in only digital. That's quite a challenging job, especially for stations that are changing channels, or vacating channels 52 to 69. For stations that need to move to a lower channel in the TV band, that's going to require installing a new transmitting facility under time constraints.

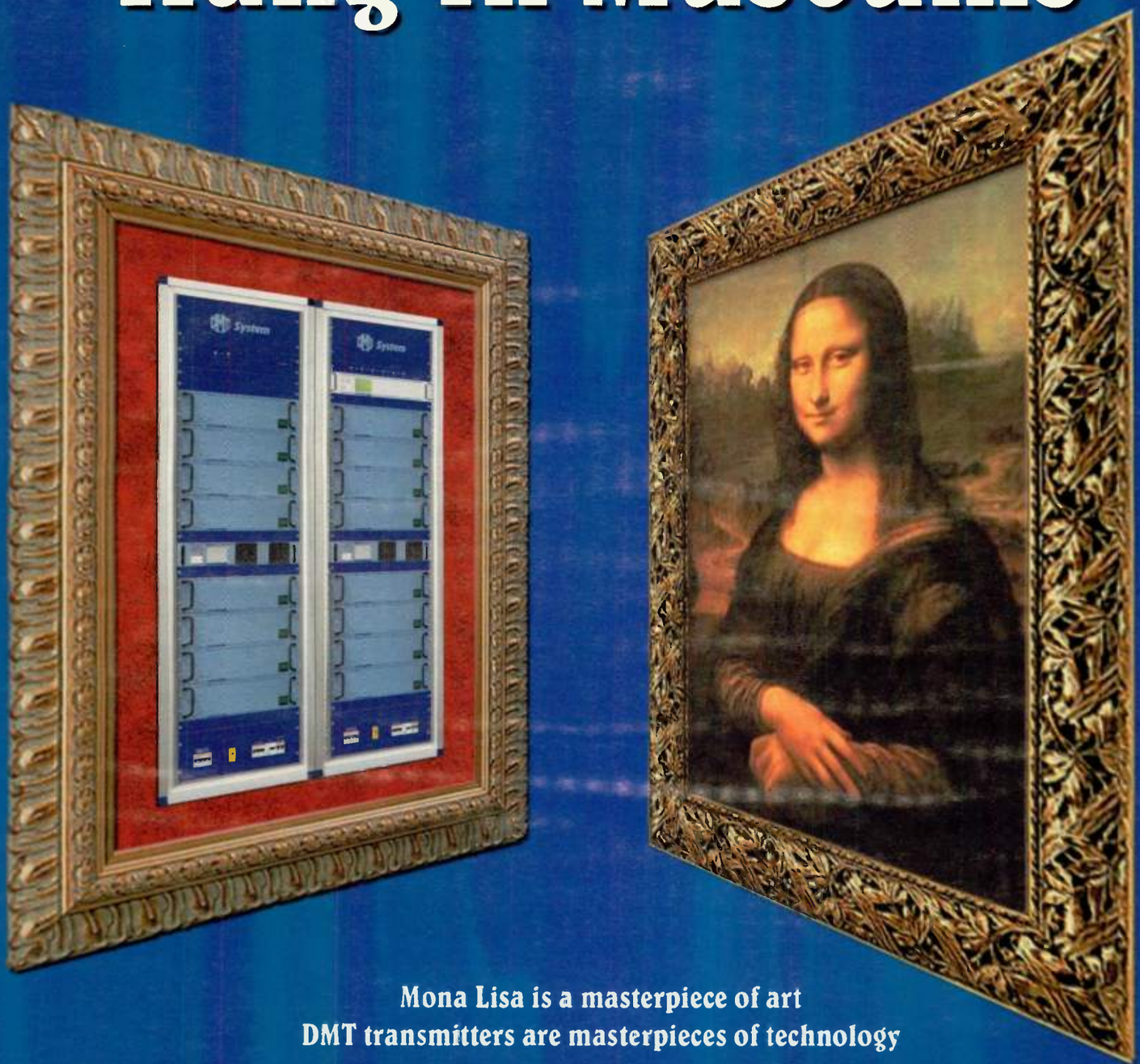
TV TECHNOLOGY: Can you tell us about MSTV's Fall Conference and how it will be different this year? How do you keep the conference fresh and relevant?

TAWIL: As we move towards the Feb. 17, 2009 shut-off date, the most critical issue we have is to inform, coordinate, and exchange information between our members about the difficulties they'll be facing to complete that transition. Communication is the key to ensuring a successful transition, communication between broadcasters and the public, regulators, equipment suppliers, and our legislators. So, for our next two annual conferences, we intend to educate our members about any pressing issues that they will need to look at expeditiously to complete the transition.

"The most serious interference case is, if the commission allows operation of personal portable devices in the TV bands."

Beyond that, it is our intention to look at emerging technologies that lie ahead. One such area is new mobile technologies within the existing TV channel. Two mobile systems are currently under development: one by Samsung and Rohde & Swartz, and the other by Harris and Zenith/LG. The industry should be complimented for the extraordinary efforts they have made during this transition especially considering the scope of the work involved. ■

Not All Masterpieces Hang In Museums



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AUDIO BY DESIGN

Mary C. Gruszka

Examining Digital Signal Processing for Surround

When you start adding things up, modern surround consoles can put a strain on digital signal processing resources.

The biggest factor is the sheer number of inputs on surround consoles—three to six times as many per source compared with stereo or mono, or more if 7.1 is considered. And of course there are additional main, group, and auxiliary outputs to consider as well.

Functions like gain control, equalization, dynamics, signal delay, fader level control, and panning are the result of digital signal processing, not direct level control through a potentiometer as in analog consoles. As more channels are added, with more processing functions per channel, and more range in the adjustments, more processing is needed.

Parameter controls still also need to be responsive when an operator makes an adjustment. Like in analog boards, controls have to work in real time, with no latency.

Digital console manufacturers have taken different approaches in dealing with such DSP requirements.

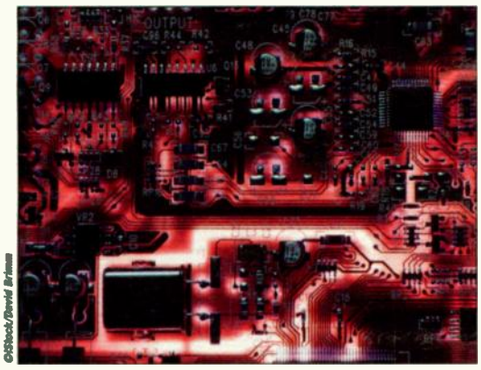
Some designs rely on a pool of DSP resources shared among the channels. In these cases, there's a limit on how much processing can be done simultaneously. Some consoles can lose DSP functions as more channels are brought into the mix, or some channels may not be able to be processed at all when the pooled DSP limit is hit, since there's not enough DSP to go around.

The idea behind this scheme is that not every channel will need every possible parameter adjusted at the same time. In post-production applications (where audio consoles are still used) or small studio productions, this approach may be an acceptable compromise between features and price.

For most broadcast on-air situations, where anything can happen at any given moment, it's probably not acceptable to run out of DSP power at a critical moment during production.

So instead of limiting DSP resources in a console system, many console manufacturers have taken the approach of ensuring that there's enough DSP power for whatever an operator may need for all channels on the desk. Handling the increased DSP load of surround consoles has inspired new designs in the DSPs themselves and in system architecture. This has resulted in more features that remarkably take up less space.

Let's look at three examples, Calrec, Euphonix and SSL.



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For most broadcast on-air situations, where anything can happen at any given moment, it's probably not acceptable to run out of DSP power at a critical moment during production.

SOUPED UP PROCESSING

Calrec's approach is to put all DSP on a single circuit board—its Bluefin High Density Signal Processing. The idea behind this Calrec-designed proprietary architecture is to increase speed by not having to pass signals from one DSP card to another, and also to allow more space for all the I/O connections. A redundant Bluefin card can be added to the system.

To get an idea of the number of channels that a single Bluefin card can support, here's the count for the different Calrec consoles (information provided by the company).

On the Alpha it's 480 and for the Sigma it's 320. In both cases, these are fully equipped mono equivalent channels. A surround channel is derived by combining two stereo channels (front left and right, and rear left and right) and two mono channels (center and LFE).

At NAB2007, Bluefin is being shown for the existing Zeta console as well as a new Greek-lettered addition to the Calrec group, the Omega. Both systems are equipped with 160 mono DSP paths packaged as 48 stereo plus 64 mono input channels which, when combined, can provide up to 24 full 5.1 surround channels.

Bluefin allows for substantially more delay than standard DSPs, according Kevin Emmott, marketing coordinator for Calrec. It incorporates over 19.6 minutes of audio delay divided into 432 mono legs of up to 2.73 seconds each. This delay can be positioned in the audio path where needed to achieve the desired compensation.

Bluefin also enables processes that were not possible with previous DSPs on the Calrec consoles. For example, the pre-fader monitor is now in full surround, and the mix-minus return feeds for surround sources can be a true mix minus of the surround signal, entirely at the operator's discretion. Bluefin also provides full control of the stereo downmix of the surround main outputs.

PARALLEL PROCESSING

The new Euphonix DF66 DSP SuperCore is the primary signal-processing engine and router for System 5 and Max Air digital mixing consoles, according to Andrew Wild, vice president of marketing for Euphonix. SuperCore is comprised of a system board and up to six plug-in SP662 DSP cards that fit in a 4 RU chassis.

The system provides not only the DSP processing, but up to 24x24 MADI I/O (1344x1344 paths at 48 kHz) per system (each card with four MADI I/O), and a broadcast router controlled by the console PatchNet Software. It performs parallel signal processing with single instruction multiple data architecture.

SuperCore provides up to two seconds of channel delay, independent EQ and dynamics processing per channel, bus processing with dynamics and filters, and failover and SNMP monitoring options. A proprietary linking design allows up to four SuperCores to be linked together while maintaining full floating-point resolution throughout the signal path.

If the system is equipped with the failover redundancy option, all audio signals are distributed to both the primary and backup DSP cores. Linked DSP SuperCores in the primary and backup systems work as one contiguous DSP core. If the diagnostics system detects a fault, the operator is notified and given the option to failover the system. Or an operator can perform the changeover at any time, if needed.

REDUNDANT PROCESSING

SSL developed the 14 RU Centuri DSP Core for its C-Series of digital audio consoles, taking a new and propriety design approach with off-the-shelf DSP processors. According to Niall Feldman, director of product marketing for Solid State Logic, this architecture allowed the company to embed design features for surround operation as part of the design.

Design goals for the Centuri Core included mission critical functions like self-healing redundant processing, redundant power supply capability and space efficiency. The processing core design allowed for the inclusion of DSP and analog and digital I/O all in the same physical unit.

DSP efficiency and processing capability were also top shelf criteria for the new proprietary software and hardware design. One new feature that resulted from the new floating point DSP processes is TimeFreeze, which allows automation to be read or written at any speed, and stopped for surround soundscape changes that are timed precisely to the edge of scene changes.

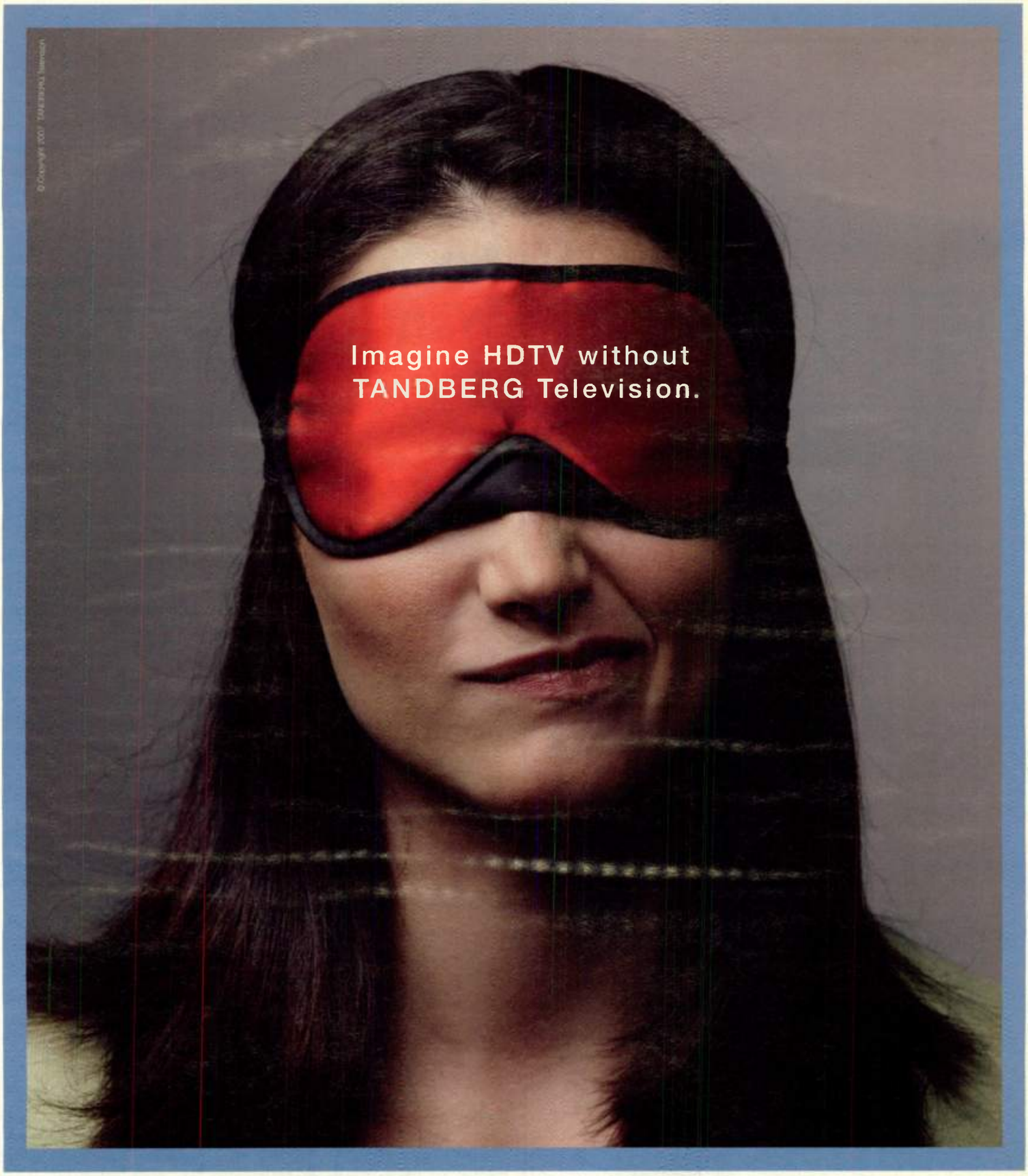
Another is digital surround versions of SSL's EQ and dynamics processing.

For larger installations, the Centuri Core can be networked with the SSL MORSE system that also provides routing and I/O expansion capabilities to allow C100, C200 and C300 consoles to work together as larger system.

When these digital mixing systems are used in practice, operators aren't aware of all the hundreds, thousands, or millions of calculations of processing that's going on behind the scenes. They just know they can turn a knob or set a control and the sound changes accordingly. And that's as it should be.

But an understanding of the underlying technology behind these new breeds of audio consoles gives a greater appreciation of all the engineering that went into their design, and can help inform the decision of which system to choose.

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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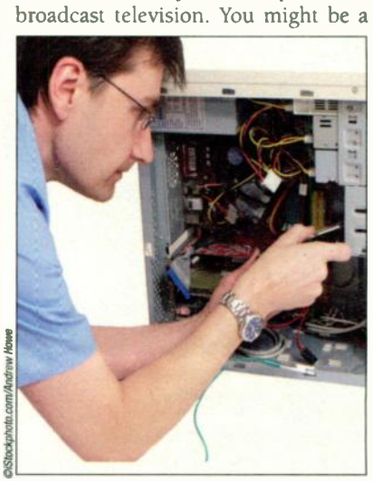
Mark Turner

So You Think You Want to Be a CTO?

Are you a CTO? Is the title "CTO" printed on your business card? Do you have a business card? Regardless of your answer, if your job has anything to do with technology, then you may be a CTO.

Technically speaking (pardon the pun), a CTO is a chief technical officer. While the "officer" part may only apply in a few select instances, the "chief technical" part of the title crosses a lot of job descriptions in broadcast television. You might be a



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chief engineer, an engineering tech, an IT director, or an IT specialist. These jobs can, and often do, perform the function of a CTO in an organization.

But does your boss think of you as a CTO? The difference between being a techie and being a CTO actually has very little to do with technology.

One of the common concerns I hear from technical people (both IT & engineering) is that they feel unappreciated or misunderstood. After all, when technical jobs are done well, nobody even knows they exist.

It's when things break and business is disrupted that technology jobs come to the forefront. Think about that for a moment. Every time a problem occurs, you show up. It's not exactly the ideal environment to promote appreciation when you are always associated with problems (even if you're the one fixing them).

Obviously, you still have to fix systems when they break. You should strive to be a great problem solver, but if you want to be a CTO, then you also need to learn to be a great contributor. Contribution is one of the key traits that will set you apart.

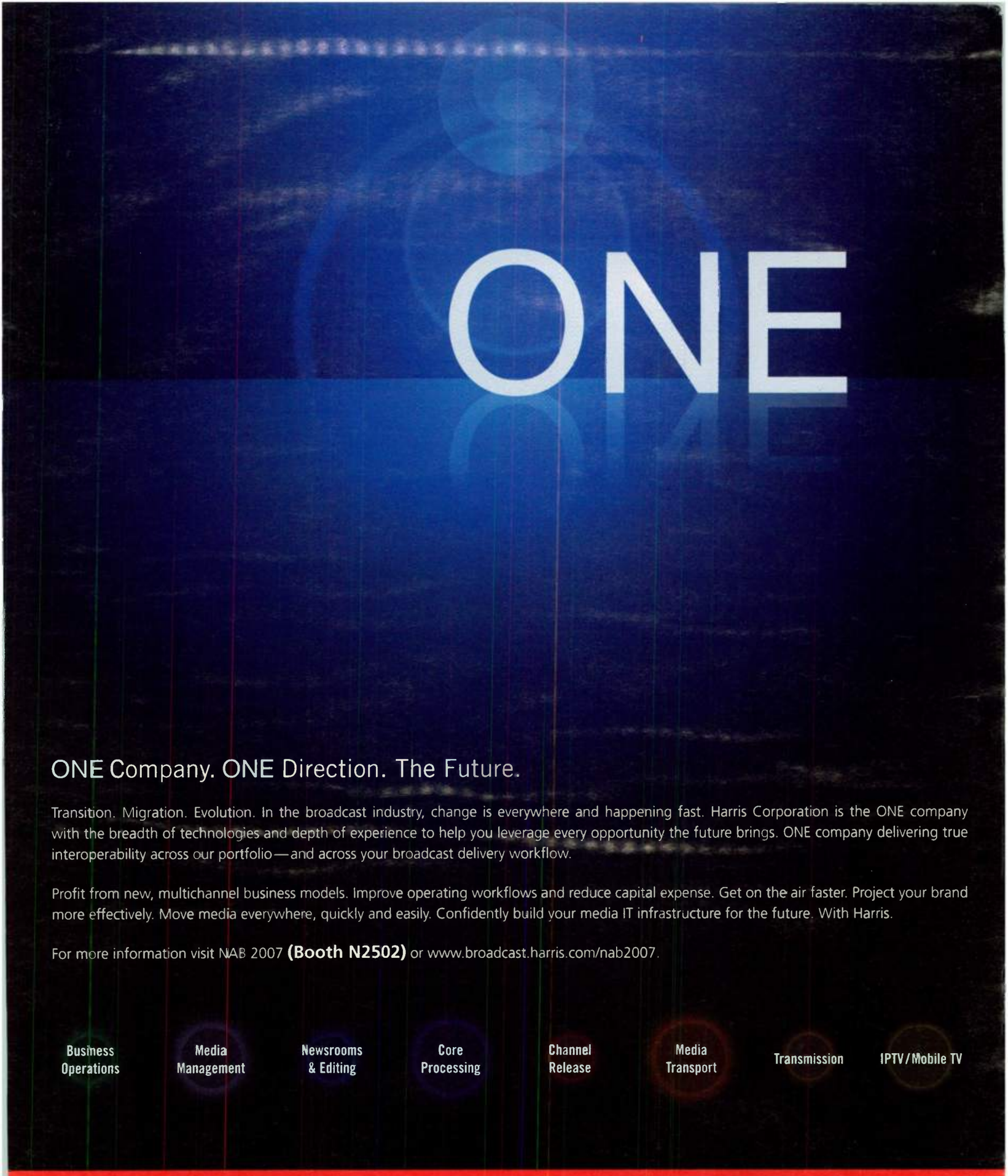
Contribution is more than repairing broken systems; it's creating or doing things that add value to your company. The question is how can you learn to contribute?

You are probably already taking the first step; learning your trade. Keep doing that. As a technologist, you're expected to understand how technology works. I'll also say that many of us on the IT side have a great deal to learn from those on the engineering side in this regard. How many engineering techs do you know who don't understand Ohm's Law? It's the core information needed to understand basic electronics and I've never met an engineer that didn't understand it. But how many IT techs do you know who can't decipher IP addresses and subnets? In my experience, many can't do this basic task, but it is the core information needed to understand, deploy, and repair IP networks. Take the time to learn the basics that form the foundation of IT.

When technical jobs are done well, nobody even knows they exist. It's when things break and business is disrupted that technology jobs come to the forefront.

The next step is to continue what you started. Namely, you must work to keep your knowledge up to date. Everyone recognizes that technology changes but it's up to you to stay abreast of the latest developments. Read trade magazines, take classes in

CTO, PAGE 39



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THE MASKED ENGINEER | Mario Orazio

This TV Tuner Cable Box 'Tis a Gift: Is It Sinful?

You might not have noticed it's a good idea to beware of geeks making gifts. This ain't about that ancient wooden horse named for a condom. I refer, naturally, to cable boxes that can receive off-air digital broadcasts.

Look, whether you believe it came from Pennsylvania, Oregon, or elsewhere, cable TV was originally a community antenna for broadcasts, period. But it wasn't long before cable subscribers got to watch things that those with their own antennas couldn't: Distant signals, weather instruments, stock tickers, fish in an aquarium (I am not making this up), and more stuff like that there.

'COMMUNITY' ANTENNA

By the early 1970s, there were also HBO, regional networks, and superstations, but I'm getting a little ahead of the story, (which ain't hard when you've got only one working neuron). The community-antenna systems were for rural areas where line-of-sight or low signal strength were the problems. Cities had a different problem—multipath.

You could pick up the world's cleanest signal at the community antenna and deliver it in mint condition to the antenna terminals of a TV, but the broadcast signal, bouncing around the urban canyons, would pass through the TV cabinet and add ghosts. It's a good thing a solution to the problem was already available.

When the FCC, Our Beloved Commish, authorized UHF TV, sets had only VHF tuners, so set-top adapter boxes were sold.

They had UHF tuners and VHF outputs. Cable just swapped out the UHF tuners for well-shielded VHF tuners. Lo and behold (but I still ain't sure how to lo), the cable box was born.

Now, then, TV sets tuned just Channels 2-13. Above Channel 6 in over-the-air land is FM radio and below Channel 7 is walkie-talkies and stuff like that there. But, in shielded cable-TV land, that stretch of 14 channels or so was fallow. Add satellites for nationwide delivery, and the nonbroadcast-programming industry was born.

These days, cable boxes offer hundreds of channels. Nielsen says the average U.S. home got 104.2 of them in 2006 (methinks the 0.2 was a narrowcast channel).

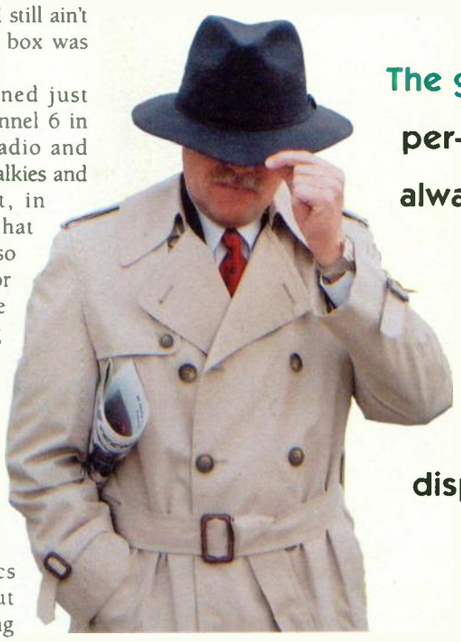
You might see statistics every now and then about how basic cable programming gets higher ratings than broadcast. What the headlines don't mention is that they're comparing the cumulative audience of all of the cable channels to what's on a handful of broadcast networks.

The greatest audience on a per-channel basis is almost always a broadcast channel. That's given most broadcasters a lot of leverage in retransmission-consent disputes—no money roll, no Super Bowl.

So CableLabs is coming to the rescue. They're developing specs for cable boxes with built-in off-air digital-TV reception.

Broadcasters have been complaining for years that Our Beloved Commish, in demanding digital "tuners" for TV sets, didn't establish any specifications for them, so, naturally, makers of cheap TV sets would use the cheapest components they could get away with, and viewers might not get any reception.

Well, now, there ain't any such a thing to worry about with these dual-mode cable boxes. CableLabs is coming up with a super-stringent set of specs that will probably exceed anything that any broadcaster has ever asked for. That's on account of the cable folks wanting to make sure that those boxes pick up digital broadcasts no matter what.



The greatest audience on a per-channel basis is almost always a broadcast channel. That's given most broadcasters a lot of leverage in retransmission-consent disputes—no money roll, no Super Bowl.

The funny thing is that those really tight specs probably ain't going to add a lot to the cost of a digital cable box. A TV manufacturer or anyone planning to offer a digital TV adapter for analog sets needs to provide a tuner, an 8-VSB demodulator, a transport-stream demultiplexer, an MPEG-2 decoder, and an AC-3 decoder, at the very least. So, what does a digital cable box already have in it? There's a tuner, a transport-stream demultiplexer, an MPEG-2 decoder, and an AC-3 decoder.

All the cable folks have to add is an 8-VSB demodulator. They've got to have a QAM demodulator anyhow, and there are many chips that combine 8-VSB with QAM. TV set and DTV adapter makers are trying to keep costs down. Cable folks have already been spending upwards of $300 on some set-top boxes, so they can afford to go for a really good 8-

MARIO, PAGE 36

INSIDE BROADBAND | Will Workman

Broadband Video Succumbs to YouTube

It's a real treat to teach bright undergrads at one of the nation's finest public universities.

Here in Madison, Wis., the university is renowned for its Midwest academic excellence, top athletic programs in football, basketball and hockey, and, of course, its partying.

How the students here maintain their academic focus while distracted by the other two areas is a question into which I've gained some insights. And the short answer is, most don't.

That's in large part because of the culture in which they immerse themselves. It's reflected in their dizzying mix of devices, from iPods to laptops to cell phones, with which they stay connected to each other and the world—or simply tune out.

One night I recently found myself, under the pretext of researching their media usage, nestled comfortably in a roomful of undergrads, just hanging out. Some drank, some nestled, some interacted with the "old guy" one of them had brought into their midst.

This went on for hours. And what do you think they spent the most time doing?

Video after video after video they watched. Sometimes on one laptop, sometimes on another. Homemade clips, concert footage, "Aqua Teen Hunger Force," hilarious European commercials, anime… and only once did they turn on the TV (well after 3 a.m., when someone brought over a videotape—of all archaic devices—to watch the "American Idol" episode they had missed the previous evening. And I didn't bother to tell them they could probably find *that* on YouTube).

SO SUE THEM

I don't think it would faze them one bit to learn that many of the YouTube clips they were watching were copyrighted. Or that YouTube's parent, Google, had in the space of a couple of weeks last month been hit with a $1 billion copyright infringement lawsuit from Viacom and an announcement of a rival launch from old-line media monoliths NBC and News Corp.

News Corp. will certainly try to mesh this new service with its gigantic MySpace social networking site, and NBC will certainly rouse its fellow media conglomerates to fend off the lawless YouTube upstart. But college students don't use MySpace; they're all on Facebook. (And besides, MySpace recently crossed the point where now more than half its users are over 30—decidedly uncool).

YouTube, meanwhile, is now delivering 100 million videos *daily*, while Google is on track to take in one-quarter of all online ad dollars in 2007, according to research firm eMarketer.

Advertisers are shifting their dollars out of TV and into the broadband space; eMarketer reports annual online advertising growth of 30 percent (while the United Kingdom this year will see online ad revenues outstrip TV for the first time).

Helping dispel any impression that this is simply a college phenomenon, I found myself a few days later in the home of a 20-something friend. And all *his* hipster friends did that evening after hitting a nightclub or two was sequester themselves in his housemate's room and ogle YouTube.

That YouTube accomplished its singular success by cavalierly ignoring copyright concerns—it doesn't prescreen uploaded videos and has blandly reassured content owners that it's working on filtering technology—is no comfort to the competitors it steamrollered or the content providers or the advertisers who pay to reach coveted TV audiences.

It's the latter's money that's now moving away from traditional TV, sending shudders through the offices of NBC, Disney, Viacom, Time Warner and News Corp. After all, how will they monetize their content if they lose that vital revenue stream?

They've had this problem on their radar for years, but were focused on the wrong threat—the digital video recorder.

If you recall, when TiVo first began marketing its DVRs, it could not promote the fact that the devices can skip commercials. Tivo was forced to yield this concession in order to access program scheduling information from the media conglomerates.

But now YouTube has become the de facto DVR of choice for young people. Why bother with appointment viewing, which only crimps your flexible party/study schedule, when you can catch up on your favorite shows in small, ad-free digestible bites?

YouTube has become the de facto DVR of choice for young people.

©iStockphoto.com/Scott Dunlap

Legal experts have offered mixed analyses of whether Viacom's lawsuit will succeed (or even whether it is simply a negotiating tactic), but no one expects a Napster-like collapse of YouTube.

FOLLOW THE MONEY

And while rival sites such as the new NBC-News Corp. venture, Time Warner-backed Veoh Networks, or Joost (from the makers of Skype and Kazaa) may lure content makers with promises of payment, no one can match the promotional scale of YouTube or its ability to shape viewer behavior and expectations.

Those expectations, that Internet video is easy to use, free and ad-free, are now set. My advice to anyone watching this spectacle is to follow the money—the ad money. If Nielsen ratings start dropping on youth-skewing shows, and CPMs drop correspondingly, advertisers will find that hard to ignore.

They desperately want the college students and 20-something hipsters, and YouTube has them.

Will Workman is a former editor of telco industry publications Cable World and MediaView. He is now working on his Ph.D. in mass communications. He can be reached care of ***TV Technology****.*

Sinful

CONTINUED FROM PAGE 34

VSB demodulator.

How come the digital cable boxes are so expensive? Well, now, you might start with that tuner. Ever since the first cable boxes, cable tuners have had to be better shielded, more selective, and better able to deal with distortion than off-air tuners.

AIN'T NO BIG THING

Then you've got your electronic program guide, your conditional-access security system, the two-way circuitry to deal with video-on-demand and impulse pay-per-view, maybe a disk drive, maybe a DVD player (same decoders again), maybe an infra-red blaster to control a VCR, maybe a spigot for a phone, maybe a spigot for a cable modem—there are lots of options. The bottom line is that it ain't a big deal for cable folks to add top-notch digital-broadcast reception capability to their boxes.

So the only question is why they'd want to. They've been fighting multicast must-carry; why would they invite it into their subscribers' homes?

The main answer has got to be those retransmission-consent disputes. Can't come to an agreement with a broadcaster? Pull it from the system.

The cable subscriber loses nothing. The broadcast-cable combo boxes can switch seamlessly between broadcast and cable reception. The cable op immediately frees up the bandwidth used by the broadcast channel and maybe the additional bandwidth occupied by channels that were part of the retransmission-consent agreement, like, for instance, ESPN-8 for ABC, MTV-16 for CBS, Fox News for Toddlers, and MSCNBCU.

Here's another thought (it takes only one neuron). I ain't a lawyer, and I'm too lazy to look stuff up, but it seems to me that there might not be any rule preventing cable ops from restricting the tuning capability of their boxes. In other words, maybe they can let their subscribers receive the Super Bowl off air but prevent them from getting any broadcast multicasts, datacasts, or even program guides.

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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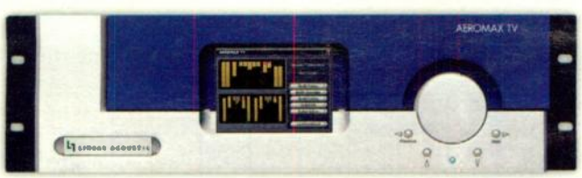

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DIGITAL TV

Charles W. Rhodes

Considering Low VHF for Unlicensed Devices

The first and to my knowledge only laboratory tests of consumer DTV receiving appliances (receivers and set-top converters) for interference to DTV reception by signals from unlicensed transmitters operating in the TV bands comes from the University of Kansas. This is Technical Report ITTC-FY2007-44910-01 dated Jan. 31. So my readers will know how interesting this report is to me, and to thee.

You can download it at *www.newamerica.net/files/NAF%20Spectrum%20Technical%20Report%20_FINAL-SUBMITTED_0.pdf*.

Three DTV receiving appliances were tested to determine the undesired signal power at which artifacts first appear due to the undesired signal when the desired (DTV) signal power D = –68 dBm. This report is largely based on the ATSC document A/74 ATSC Recommended Practice: Receiver Performance Guidelines.

This report was endorsed by several organizations as a basis for minimum performance standards for qualifying digital-to-analog converters for a federal subsidy through the National Telecommunications and Information Administration.

In my opinion, whatever the NTIA comes up with as a performance standard for these converters will become the de facto standard for all DTV receiving appliances.

The test results are presented in Fig. 5 of the report. Note that these tests were all run at D = –68 dBm and that the undesired signal power (U in dBm) at threshold of visibility is given, not the more usual D/U in dB. The only desired level tested to date by the University of Kansas is D = –68 dBm.

Co-channel, adjacent channel (n-1, and n+1), and UHF taboo channel interferences over a range of U channel offsets from –10 to +15 are reported.

Co-channel interference: One of the three receivers performed below the ATSC recommendation while two performed better. The spread between best and worst was 12 dB.

Adjacent channel interference: None of these receiving appliances outperformed the ATSC guideline for (n-1). The worst receiver fell 9 dB below the guideline. One receiver exceeded the guideline for n+1 by 6 dB while the other two fell a few dB below the guideline.

UHF taboo channel offsets from the D channel: The U channel ranged from n-10 to n+15. This allowed testing for image frequency interference (channels n+14 and n+15).

None of these receiving appliances outperformed the ATSC guidelines in these channels.They performed about 15 dB worse on average than the guidelines. This is not surprising as the FCC did not set any limits on D/U ratios for DTV-DTV interference other than for co-channel and adjacent channel interferences. D/U is an oxymoron in terms of the current FCC rules for DTV-DTV interference where UHF taboo channels are involved.

Perhaps this abysmal showing will galvanize the FCC into reconsidering the need for protecting DTV reception from such interference.

The report does not include the effect of undesired signal power from unlicensed devices on DTV receiver inputs.

However, all the data needed is available to the public. Using this data, I reported in May, 2006 that the maximum undesired signal power at a DTV receiver input port will be –14.2 dBm where the DTV receiving rooftop antenna is 100 feet from the transmitting antenna of *one* transmitter with a power output of 1 watt (EIRP = 2.4 watts).

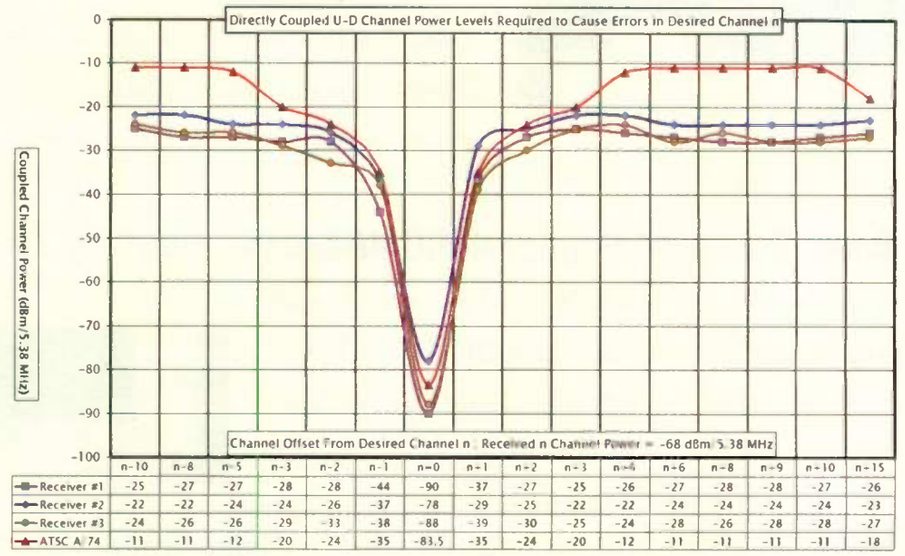
I chose the spacing as representative of what one finds in suburban residential neighborhoods the lot frontage. Note that there are at least six structures within this radius of the DTV receiving antenna. Note also that in cities, frontage is typically 60 feet, which would increase the U to above –10 dBm.

Dr. Oded Bendov, in his paper published in IEEE Transactions on Broadcasting December, 2006, Vol. 52, No. 4, reported similar calculations. The undesired power from an unlicensed device with a 1 watt output would be up to –4.1 dBm for a DTV receiver antenna three meters away.

All of these calculations are based on the FCC planning factors for DTV.

If you look at Fig. 5, you will see that the ATSC guidelines would *not* protect against interference from unlicensed transmitters. This was never the intent of the writers of these guidelines as at the time it was drafted, there was no prospect to suggest that the FCC would authorize such sharing of broadcast spectrum.

DEVICES, PAGE 41



	n-10	n-8	n-5	n-3	n-2	n-1	n+0	n+1	n+2	n+3	n+4	n+6	n+8	n+9	n+10	n+15
Receiver #1	-25	-27	-27	-28	-28	-44	-90	-37	-27	-25	-26	-27	-28	-28	-27	-26
Receiver #2	-22	-22	-24	-24	-26	-37	-78	-29	-25	-22	-22	-24	-24	-24	-24	-23
Receiver #3	-24	-26	-26	-29	-33	-38	-88	-39	-30	-25	-24	-28	-26	-28	-28	-27
ATSC A/74	-11	-11	-12	-20	-24	-35	-83.5	-35	-24	-20	-12	-11	-11	-11	-11	-18

Fig. 5 Example initial DTV receiver measurement results

CTO

CONTINUED FROM PAGE 32

person or online and join user groups. Whatever your learning style is, just make sure you keep learning and are aware of changes in technology.

The third step is what usually trips up technical people (myself included). Learn everything you can about the business of television. Don't limit your knowledge to technical issues alone; learn how News works, and how Sales gets their job done. Seek to understand every aspect of the business.

Every time a problem occurs, you show up. It's not exactly the ideal environment to promote appreciation when you are always associated with problems.

Early in my career, I made the mistake of thinking that being the best technical guy was the ticket to a successful future. I must admit, that approach took care of me for quite a while but I soon realized that I wasn't contributing much to the real success of the company that I worked for.

TRANSLATING SMARTS

While learning about business may seem daunting at first, I've found that technical skills are a great primer for learning business skills. Technical people understand systems and processes. For the most part, business is nothing more than systems and processes. If you can break a complex process down into small processes, then you can understand what drives your business.

I can't stress the importance of learning your business enough. You'll often hear senior managers in any business complain that they simply can't understand what their technical people say. Your job is to learn their language and speak in terms that they can understand.

Understanding business processes will help you do that. The final step in this quest for appreciation is to combine the first three steps and put them into action. Use your technical knowledge and your business knowledge to contribute to your business. I'm not trying to imply that you don't contribute now, but there is a bigger opportunity. If you can understand business processes, then you can start finding the places that need help.

Maybe someone is spending a lot of time with a manual process that could be easily automated with the right tools. Maybe there's a salesperson with a new product idea who just doesn't know how to get past the technical issues. Be a problem seeker as well as a problem solver.

Once you begin to develop your business acumen, you'll also be better prepared to understand and explain the benefit of new technologies. Technologies alone don't have much value unless they can be put to productive and profitable use.

If you can apply your technical knowledge to a problem in a way that reduces cost or better yet, increases revenue, then you'll have made a great step forward in being appreciated and rewarded because of your contribution. Maybe you'll even have people thinking that CTO is an acronym for "contributing" technical officer.

Mark Turner is IT director for Media General Broadcast Group in Richmond, Va. He can be reached via ***TV Technology****.*

PRODUCTION MANAGER **Craig Johnston**

Graphic Sounds Crowd Out Quiet Dialog

Okay, maybe I should take some of the blame for what I'm going to complain about, because it was my own fault that I watched a "chick" flick on a cable network the other night. And it had some quiet, sensitive, meaningful dialog that I had to hear if I was going to follow along.

Anyway, it seemed like every five minutes or so a set of graphics touting an upcoming show would slide in from and out to, the lower right side of the frame. It was visually a tad annoying, but nothing I couldn't live with.

SLEEPING ON THE JOB

However, accompanying the movement of those graphics was a low frequency sound that masked the dialog that I was listening to. There's a relationship building in the movie, a magic moment happening, and all of a sudden that damn graphic sound covers up the dialog.

Now I don't watch enough of these types of movies for this to become a major problem in my life, but there are likely some viewers who watch a lot of them, and unless they have the dialog memorized or are really good lip readers, it must drive them berserk.

It kind of reminds me of a Jack Lemon/Walter Matthau scene in one of the "Grumpy Old Men movies. Matthau has a channel changer programmed to Lemon's TV and can point it at the TV through a window. Every night as Lemon is anxiously listening to the lottery numbers, the channel unexplainably changes and he doesn't get the last one.

The noisy graphic is exactly like that except for one thing—no one was intentionally trying to mask the dialog. It just happened automatically. I'll bet that an automation system was instructed to run that graphic sequence every so many minutes, regardless of what was going on. And like a good automation system, it did exactly what it was told.

I don't watch that particular cable channel all that regularly, so I don't know if this particular sound and graphic combination is new or has been part of the regular schedule for some time. But if anyone working at that cable channel actually has been watching the channel, not monitoring, but watching, then it's hard to believe that the sound that goes with that graphic is still there.

The Hippocratic Oath says something about doing no harm. Maybe television isn't, as they say, brain surgery, but to paraphrase the oath, maybe we shouldn't do anything that takes away from the viewing experience.

That's an order most channels break every day, however. Commercial television puts on commercials, and that takes away from the viewing experience. Public TV has those pledge drives.

And C-SPAN takes away from the viewing experience by letting politicians speak. And the government gets involved in lessening the viewing experience by dropping those EAS alerts right in the middle of somebody saying something interesting.

But this sound and graphic combination seems like an ill thought-out addition to the telecast. And it just plain wrecks the viewing experience when you can't hear quiet dialog.

A station where I worked some great number of years ago set aside one week a year when the management team watched the station. It wasn't a case of watching it in their offices, while doing their work-a-day jobs. Five of them each spent a very long day at home, *watching* the station, taking notes about the on-air look, and sound.

I don't think there were any sound and graphic combinations back then, but they caught a lot of little details. They found inconsistencies in the way pretaped news updates referred to the evening news, commercials that touted last weekend's clearance sale; those kinds of things.

One thing in particular I remember that got caught was a station ID that was apparently being supered over an important crawl coming from the network. The solution was to come up with a second ID super that was a little higher in the frame, so it could be supered without wrecking the crawl.

JUST BECAUSE THEY CAN

The reason I think the big shots at stations and networks ought to do some actual viewing of their programs is that with all the bells and whistles on new equipment, I'm convinced that we're doing some of these graphic and sound things because we can, not because we should.

Looking through the NAB press handouts this year, the word "workflow" is probably still the undisputed champion for the third or fourth year running, but "branding" is sneaking up toward the top of the list. And the branding devices are automated so they can lay graphics (and probably sound) on all the channels of a multicast without requiring an operator. The only people who will see (and hear) the effects are the viewers themselves.

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

Devices

CONTINUED FROM PAGE 38

Those writers took into consideration the maximum undesired DTV signal power likely to exist in residential neighborhoods. This is shown in Appendix A of ATSC document A/74.

Readers of this column know that I've been warning that it would be a misuse of A/74 to set minimum performance standards; it was never intended for such purposes. Guidelines are not standards, they are guidelines only, and should be at the discretion of the user.

The University of Kansas report includes the following conclusions which I quote: "In this report, we have presented a feasibility study of secondary transmissions into the TV spectrum, and our preliminary experimental results support the claim that properly implemented secondary transmission in the television band is possible without significant impact upon DTV reception.

"Our hope is that this study and future results from continuing work at the University of Kansas in this subject area, will be of value in regulatory discussions concerning spectrum policy decisions that will ultimately define access to a valuable national asset, the TV band spectrum."

Let there be no mistake. I do not agree with this conclusion, primarily because it omits the effect of undesired power levels at receiver inputs. This effect has been demonstrated in the published work of two independently working, unpaid experts.

MY PROPOSED SOLUTION

This column has already suggested the use of the low-VHF band, Channels 2-6 by such unlicensed transmitters. It is well known from the published literature that the coverage of DTV signals in this band is limited by manmade noise, which was not taken into account in the planning of the DTV service.

It is also known that the actual coverage of DTV signals in the low-VHF band is currently less than authorized ERP, and will have to increase on the order of 10 dB for maximum coverage. Broadcasters planning to use a low-VHF channel should ask their consultants how much more power they should seek, and may wish to reconsider their choice for their permanent TV channel.

The maximum ERP for DTV in the UHF band is 1,000 kW and this is related to the relatively high minimum usable DTV field strength (41 dB μV/m) in this band. The minimum field strength needed in the low-VHF band is 28 dB μV/m. So for a given power coverage is greater in the low-VHF band.

However, in the case of unlicensed transmitters, these are allowed to have the same transmitter power output whether operating on Channel 2 or 51. Clearly, where long distances are involved, such is the case in seeking wireless internet access in the Western states including Alaska, the low-VHF band has great attraction. Furthermore, manmade noise is minimal out west, and especially in Alaska.

The few broadcasters planning to use a low-VHF channel can, I believe, find a suitable alternative outside the low-VHF band. Thus, the interference to DTV reception is guaranteed not to result from the wireless access unlicensed transmitters on Channels 2-6.

Persons seeking wireless Internet access will gravitate to the low-VHF channels, so this is the logical portion of the broadcast spectrum for such uses. Those in need of the longer distances possible in the low-VHF band frequently own tall towers with VHF antennas in place, and they are in the quietest areas of the country where the low-VHF spectrum will be most efficient.

Restricting unlicensed transmitters to the low-VHF band could provide affordable wireless Internet access to places where it's now unavailable. However, the same restriction may not be acceptable to those having other objectives, such wireless interconnectivity of information processing, storage, and display gadgets in homes and offices.

Nevertheless the deployment of such transmitters on all TV bands will probably result in the cessation of terrestrial broadcasting when reception becomes erratic and unreliable.

This would first be evident where viewers receive their television signals from TV translators or low-power TV stations. These are secondary licensed users of spectrum.

The Kerry bill (S.234) would prohibit the FCC from providing protection against interference to any secondary licensed user of spectrum. If and when there are millions of such transmitters in use, their continued usage could not be denied because the owners will be unknown.

Readers should note that these are my views and that I am not speaking for any group or organization.

Charlie Rhodes is a consultant in the field of television broadcast technologies and planning. He can be reached via e-mail at cwr@bootit.com.

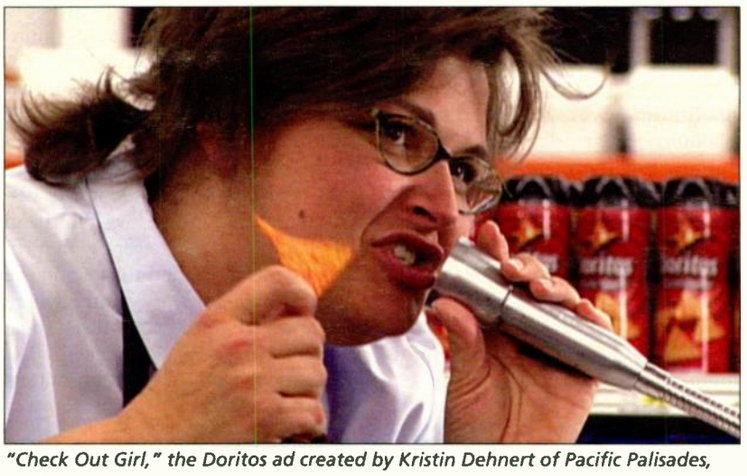
FOCUS ON EDITING | Jay Ankeney

Rookies Score Big at Super Bowl XLI

The ads of Super Bowl XLI were the gift that kept on giving. The game itself between the Indianapolis Colts an the Chicago Bears was marred by rain and fumbles, but for those at my Super Bowl party in sunny So Cal, the plays on the field were just an opportunity to hit the fridge so we wouldn't miss a minute of the commercials in between. After all, CBS would always replay any significant action on the gridiron that we missed, but we'd have to rewind the Moxi DVR to review a key commercial.

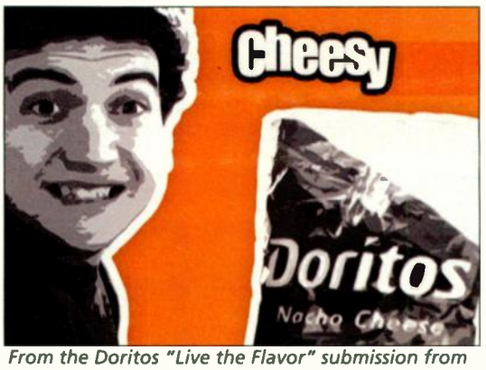
Fortunately, the highlight of the extravaganza I was waiting for occurred shortly after the Bears' rookie Devin Hester, No. 23, returned the first kickoff 92 yards for a surprise opening touchdown.

In the first commercial break, right after a super-dumb blurb featuring some dude whacking his friend's head with a rock to win a beer, Frito Lay ran their "Live the Flavor" spot for Doritos chips made by first time broadcast wannabes. The rest of the game was left to the pros.



"Check Out Girl," the Doritos ad created by Kristin Dehnert of Pacific Palisades, Calif.

"Since we already owned our equipment, the total production budget was just $12 for four bags of Doritos."
—Dale Backus, Five Point Productions



From the Doritos "Live the Flavor" submission from Dale Backus.

"Live the Flavor" is a simple piece of purely poetic, innocently novice inspiration. These guys just didn't know it couldn't be done.

As an aria from Verde's "La Traviata" distracts us, the spot starts with a close-up of a red Doritos bag on a car seat accompanied by the on-screen credit "Creator, Dale Backus."

Cut to the young driver (Nick Dimondi) opening the bag with his teeth. A girl (Cori Backus) walking by in wide shot carrying a similar sack of chips notices him, and in CU raises her Doritos bag in salute. Freeze to a rotoscoped white outline of the girl over a red field with the words "Spicy" near her smile.

Cut to CU of the driver as he lifts his bag in reply and freeze his goofy (yet hopeful) rotoscoped grin keyed over an orange field with the word "Cheesy." Drop the roto fx and—with the sting of an audio tire squeal sfx—the guy smashes his face into the steering wheel. The camera continues to move forward past the windshield leaving him out of frame. Music stops.

Fast cut back to the driver with added car crash sfx. The Doritos bag is crushed between his head and the steering wheel as a roto freeze brings on the word "Crunchy."

The Verde violins begin again and quick rear and front shots of the driver show him recovering. A CU of the girl as she sees his dilemma goes to a wide shot of her hurrying to his aid. Roto freeze with the word "Bold."

The operatic tenor's voice blends with sfx of nearby traffic breaking as the girl runs toward the driver's car.

Through the driver's side window ,we see her approach. Roto freeze her face with the word "Smooth" just before she slips, falls, drops out of frame, and the car jerks as she smacks into the door. CU of driver looking toward the mishap. Wide shot from side as the girl picks herself up from the street, clutching her smashed bag of Doritos. Bring on the title "Live the Flavor" above the URL

"SnackStrongPro-ductions.com" while the guy leans out the window over the girl rubbing her head and they smile at each other.

The ad is flashy, romantic, sublimates the product to its humor, and makes little sense. What more could you ask for in a Super Bowl spot?

The ad's creator, Dale Backus of the recently formed Five Point Productions in Cary, N.C., said they had only four days to conceive, produce and post the commercial. But once it won, except for adding their logo, Doritos aired it unchanged. As Dale said, "It's a 30-second romantic comedy trying to personify the attributes of a Doritos chip. Since we already owned our equipment, the total production budget was just $12 for four bags of Doritos."

"Live the Flavor" was one of five, $10,000 winners of a national competition for "consumer-created Doritos tortilla chip ads" conducted by Frito-Lay North America, the $10 billion convenience foods division of PepsiCo.

More than 1,000 ads were uploaded to Yahoo! Video/Jumpcut between Oct. 10 and Dec. 4, 2006. Anyone could vote for their favorite commercial on the "Crash The Super Bowl" Web site, and when the polling closed on Jan. 19 at 11 p.m. Central Time, "Live the Flavor" was the winner by a 2 percent margin.

Knowing Super Bowl air time cost up to $2.6 million for a 30-second slot, Doritos took the gamble "to give consumers an opportunity to express themselves," as Ann Mukherjee, vice president of Frito-Lay marketing, said in a press release. "All five 'Crash the Super Bowl' finalists celebrated the Doritos brand and expressed their creativity in such unique ways."

The other top-voted ad from this campaign that ran during the Big Game was "Check Out Girl," created by Kristin Dehnert of Pacific Palisades, Calif. and the other three finalists' spots aired in March. These included: "A Chip Lover's Dream" by Jared Cicon of Claremont, Calif., "Duct Tape" by Joe Herbert and Dave Herbert of Batesville, Ind., and "Mouse Trap" by Billy Federighi of Beverly Hills, Calif.

All of them can be viewed on dozens of Web sites, but "Live the Flavor" crowned many lists in popularity. Principle photography for "Live the Flavor" was shot in 30p HDV by Barrett Phillips with a JVC ProHD HD100 camcorder who also created the rotoscope effect in Photoshop. It was edited by Barrett's brother Wes using Apple Final Cut Pro 5.1 on a dual processor G5 PowerMac system during a 16-hour session.

"We ingested the 30p from the JVC HDV camera without a glitch," Wes said. "The only major challenge was that since we were shooting in HD, and we knew the contest rules wouldn't allow other identifiable product names to appear in any of our shots, we didn't want anything disqualifying to be visible in the background. So we had to use FCP's effects capabilities to zoom in on some of the takes to make sure they were clean."

The final pratfall by actress Cori Backus where she falls on her face was a golden shot, though, Wes said. "It was the final setup of the first day's shooting," he said, "and we didn't have the heart to ask her for a retake. Luckily, when we looked at the footage the next day, the shot was hilarious. So we went with it."

Wes knows this was a great opportunity. "I can't imagine an executive at Doritos spending $2.6 million to air something that was produced for $12," he said. "But it really has opened some doors for us."

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

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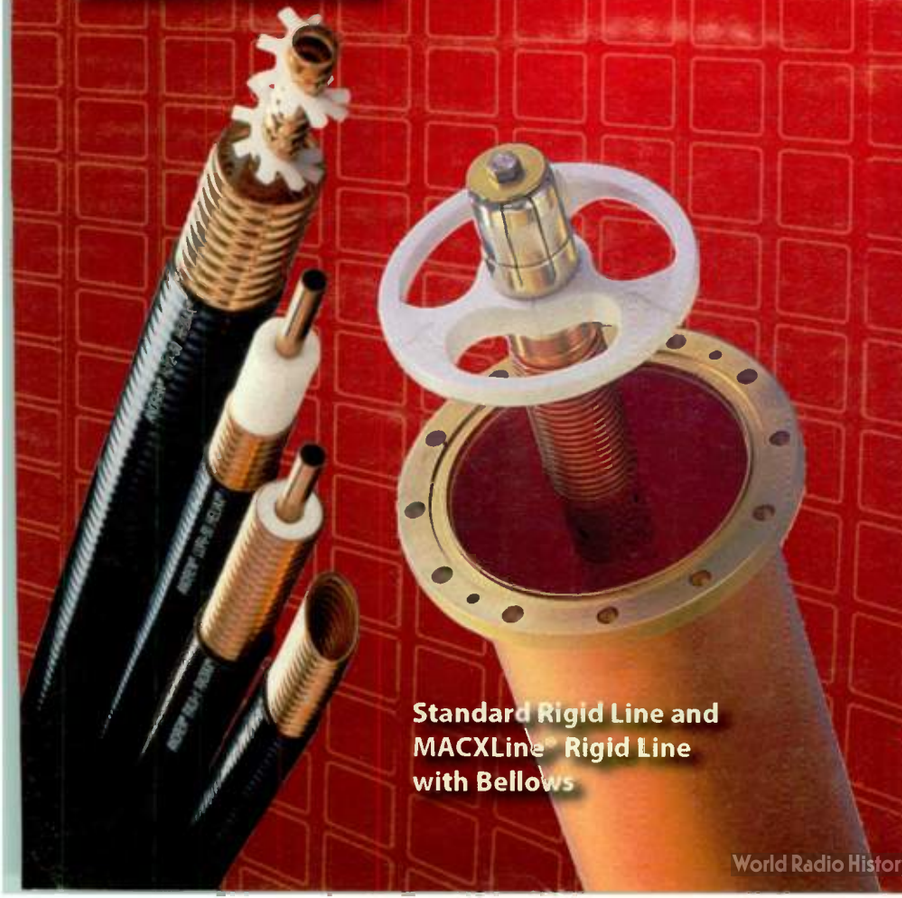

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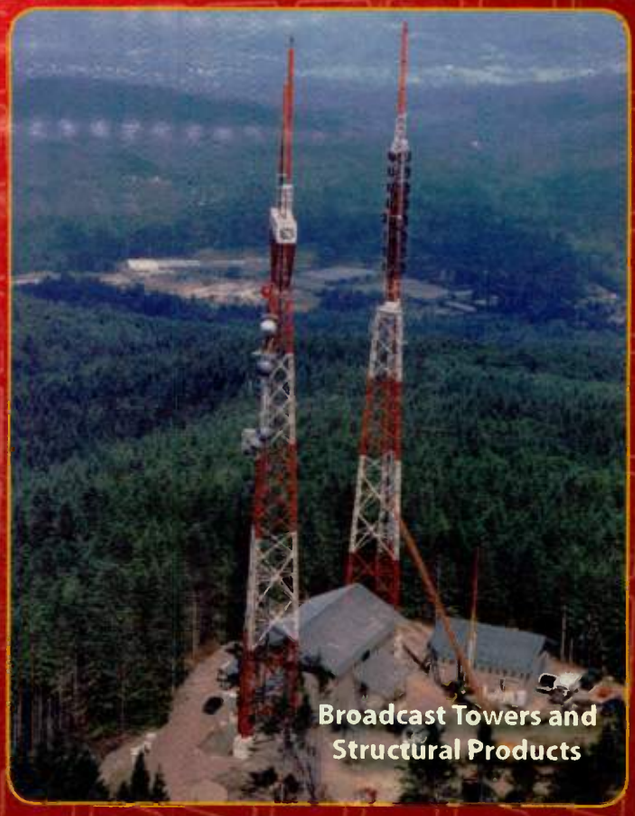

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Photo: Steve Jordan

NET SOUP | Frank Beacham

Content Bullies Burn Bridges With Customers

I was delighted to get word that my alma mater, the University of South Carolina, had finally made the top rankings of the nation's colleges and universities.

The RIAA, that collective of wizards who represent the world's commercial music industry, ranked my school No. 5 in the nation for illegal music downloading. Wow, we even made Rolling Stone! Too bad we couldn't topple Ohio University at No. 1, but I'm relieved that we're now known for something other than championship beer drinking.

As one who makes a living creating and selling intellectual property, I guess I should be offended that all those students are supposedly stealing music. But, oddly I'm not. If I were in their shoes today, I suspect I'd probably being doing the same thing.

I say that because I have a real quarrel with any business (be it music, television or movie) that gets so heavy-handed that it mounts an economic terror campaign on its best customers. A side of me says these desperate music industry operatives are getting exactly what they deserve.

©iStockphoto.com/Dan Brandenburg

This is not the stark black-and-white issue that the content owners would have you believe. It's a myth that there's a mob of online thieves just waiting to rob a handful of companies that represent the world's talent pool.

I personally know several college students and have engaged them on the subject. Sure, they download music. Sometimes they pay, but will gladly get it for free whenever they can. However, they don't see the act as stealing any more than my generation did when we made a cassette copy of a vinyl disc for a friend.

Most important, not one—without exception—said they would steal from an artist that they personally admire. Even those whose moral compass may not extend heavenward found stealing from a favored artist a truly reprehensible act.

So where's the disconnect here? I'd argue it's a group of greedy, out-of-touch middlemen whose time is up. They failed to adapt to new technology and, because of it, have been left behind. Yet, they refuse to exit the stage or give up their slice of a very rich pie.

Now the cat is out of the bag. The kids are smart. They know too much. For one thing, they know the RIAA has little to do with the music or the artists they like. They see it as a group of fat cat lawyers and agents whose main function is to suck unreasonable profits off the sale of music. Fair or not, the RIAA, through it's outrageous overreaction to online music trading, has reinforced that perception. The well is now so poisoned that I'm not sure the situation can or will be reversed.

It's a myth that there's a mob of online thieves just waiting to rob a handful of companies that represent the world's talent pool.

Music, of course, is not going away. If anything, the digital era offers the opportunity to access and enjoy artists in more ways than ever before. What we're witnessing are the last gasps of few companies attempting to hold on to outdated business models.

It would be helpful if members of Congress would quit focusing on the interests of these businesses and turn instead to the rights of the music customer. Strong, clear laws that preserve the fair use of copyright protected content are desperately needed.

Only with such legislation can we stop content owners from bullying consumers over how they copy, trade and manipulate media for personal use. Unfortunately, the RIAA, as well as other major content owners, have had too much of a say-so in the drafting of such legislation in the past.

Digital rights management should be abolished. This would open the market to the sale of convenient, easy-to-use, nonproprietary music and media downloads. Since product manufacturing and distribution costs would be reduced to almost nothing, the price of high-quality music downloads, if set fairly, should be so low that stealing files would be more trouble than it's worth for most people.

These issues were Topic A at the recent South by Southwest (SXSW) music conference in Austin, Texas. David Byrne, the former frontman for Talking Heads, tackled the issues head-on in a talk billed "Record Companies: Who Needs Them?"

Byrne suggests that in a digital world—where file downloads are quickly outstripping the popularity of CDs—that record companies change their focus from manufacturing and distribution to the marketing of artists.

Those music labels, he predicts, will be faced with a choice: Either ramp up marketing services to use music as a loss leader for tours and merchandise revenue, or aim only for international stars in the mold of Britney Spears.

Citing singer/songwriter Aimee Mann as an example, Byrne said music artists can now operate without the support of record companies through the Internet. Marketing, Byrne emphasized, is never cheap or easy.

However, he noted there are many new ways for artists to sell themselves. Sites such as YouTube now offer artists more possibilities than even MTV, he said. "Nobody is telling you have to make a million-dollar video," he said.

Of course, the amount of dollars is at the center of this entire debate. File downloaders chafe at high prices that they feel reward record companies far more than artists. Some music fans want to cut out the middlemen and deal directly with the artist.

This issue was highlighted at the SXSW conference when Peter Jenner, economist-turned-music-manager (Pink Floyd, The Clash, Billy Bragg), estimated how much each music fan who buys music would have to pay in order for access to every song ever recorded while maintaining or increasing music sales.

The number: $50 per year. Jenner said that amount from every person who listens to music would "meet or exceed the current over-the-counter sales of the music industry at a far lower cost."

However, because of the deeply entrenched industry business model, such a system would probably never be put in place even though it would increase profits and allow greater access to music.

Like so many difficult issues, the file downloading controversy is not as it may seem on the surface. It is certainly not about thieving college kids. It's about money, and whether an entrenched cartel will continue to control music's sale and distribution in the digital era.

These matters are not limited to music. Television and motion pictures are next. Hopefully, a new generation of content owners will learn from the mistakes we are witnessing today.

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

SOFTWARE MONITORING

Divergent Media Scopebox

by Michael Hanish

Sometimes I love the competitive nature of the marketplace. Just as I was thinking what a shame it was that DV Rack, software scopes and analysis, were only available on the Windows platform, along comes ScopeBox for Macintosh from Divergent Media. It's more than just a "box o'scopes," as we'll see in a moment.

FEATURES

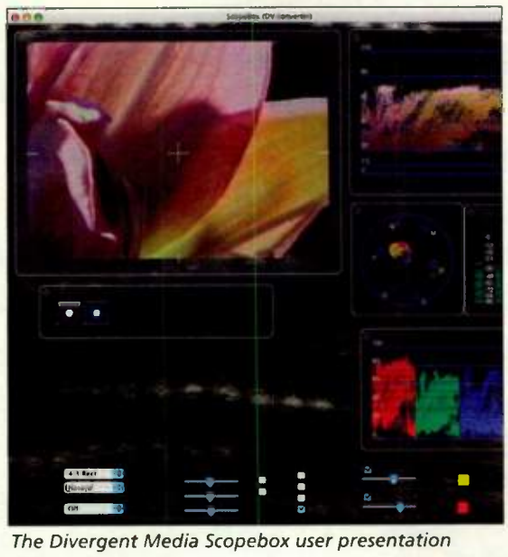
ScopeBox is a Macintosh OS X-only application that reads a FireWire input or a QuickTime file and provides a confidence/preview monitor, waveform monitor, vectorscope, VU meters, RGB and YUV parades, RGB and luma histograms, timecode monitor, as well as a hard disk recorder that can capture the FireWire input to any QuickTime format installed on the computer.

This is quite a feature list in an elegant interface, and also available at a very reasonable price. The application requires at minimum OS X 10.4 and QuickTime 7.1, and performs best with at least 1 GB of free hard-disk space, 1 GB of RAM and a graphics card with 128 MB VRAM. ScopeBox will run on G5s, Intel-based Macs and G4s, though performance may suffer on the latter.

The application opens into a simple and uncluttered black window (though it can be toggled into full-screen mode), with the default configuration of three palettes: Preview window, waveform monitor and vectorscope. All palettes are resizable and sizes, positions and control and input parameters can be saved to one of a number of custom layouts. By default, all the instruments sample every line of the input video at full resolution. If performance suffers on an older or underpowered system, the scopes can be set to sample every other, every fourth, or every eighth line. A single click in any palette window brings up related controls at the bottom of the ScopeBox window.

The Preview Palette shows the selected video source, either any standard QuickTime input device (such as FireWire DV) or a QuickTime file. Input settings allow for selection of any device-specific video or audio option, setup level and timecode source (serial or FireWire).

The Preview Palette controls the image as seen on the monitor. It provides for monitor calibration (with sliders to adjust brightness, contrast, and saturation), a blue gun button, as well as framing and overlay controls. You can set the aspect ratio of the Preview to either 4:3 or 16:9, to ensure that the display matches the source.



The Divergent Media Scopebox user presentation

You can also choose to display the image at natural resolution, or zoom in 100 percent or 200 percent as an aid to focusing. Overlay choices are plenty and useful. There are framing and composition guides, including title safe, center, 3x3 grid and aspect mask, as well as adjustable luma and chroma zebra displays. Finally, the preview image can be flipped horizontally or vertically.

The recorder window is, likewise, as simple as can be. It consists of a record button and a stop button, with controls appearing below to select capture path, record format (QuickTime or raw DV stream), lock to camera (so that ScopeBox begins and stops recording when the attached camera does) and buffer length. ScopeBox allows the last preset number of seconds to be held in memory and saved when recording begins, as a sort of lead in or safety to catch unexpected or sudden actions.

IN USE

I had the pleasure of using ScopeBox in several situations, on both studio shoots and at more remote locations, running on both a desktop and a laptop. I started close to home, shooting several interviews in my studio and running ScopeBox on my work machine—a dual 2 GHz G5

One of the interviews was particularly twitchy, leading to out-of-focus moments that were easy to stay on top of and smoothly correct, using Scope-Box's oversized preview monitor with the zoom set at 200 percent. Having an oversized VU meter with a long peak hold time also made interview life easier.

I suspect most people who use ScopeBox will do so with the application running on a laptop. This is just what the developers had in mind when designing and coding the program. I used ScopeBox on a MacBook Pro, where it ran like a champ—responsive and easy to see and use.

Obviously, even with the application running on a laptop, it is not for run-and-gun situations. It does work very well for any quick setup and shoot situations, and the ability to have a monitoring system in the field that is extremely lightweight, easy to power and set up and easy to see is a huge plus.

Even in a snowfield behind a barn, it was very easy to get the Preview Palette properly calibrated with my camera, and full confidence recording followed. I also found, a bit to my surprise, that I very much liked and used the Colorize function for the waveform monitor and vectorscope. When engaged, it replaces the usual green traces with the colors represented in the video image. For quick glances, this was incredibly handy.

SUMMARY

Even though ScopeBox was developed as primarily an acquisition-side application, I find it handy during editing and post work as well. Some years ago, and after careful consideration, I sold off my hardware scopes and, of course, have found an almost constant need for them in every project since. That dynamic seems to be a constant in my universe.

I have made do with a number of software surrogates, but have not been entirely satisfied with those video monitoring and analysis tools until I started using ScopeBox. The surrogates either don't read enough of the image to be of more than passing interest as far as meaningful analysis goes, or are limited to working in a single host program. I especially like the ability to play and analyze QuickTime files, and found that function very useful at various stages of post. And I never really thought I would need a confidence recorder, but it certainly has proved worthwhile, and even a lifesaver, on a number of occasions.

According to its developer, ScopeBox will soon be getting full HDV support. This will be on the market as soon as it is available in QuickTime. That will only add to ScopeBox's flexibility and usefulness. This is a rock solid and beautifully functioning tool. Add it to your studio's tool set, and you will wonder how you ever did without it.

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

FAST FACTS

Application

Anywhere a waveform or vector monitor is needed

Key Features

Selectable aspect ratios, up to 200 percent zoom control, capture feature

Price

SD version: NTSC or PAL, $399; HD version: NTSC or PAL, $699.

Contact

Divergent Media
888-632-0904
www.scopebox.com

HARD DRIVE STORAGE

Focus Enhancements FireStore FS-100

by Geoff Poister

In a sentence, the FireStore FS-100 is a 100 GB disk drive optimized to capture video from the Panasonic AG-HVX200 P2 camera. But it is actually a lot more than that.

It is also a sophisticated mini computer that allows you to record, view, organize and play back clips in the field. In DVCPRO HD, DVCPRO 50 or DV/DVCPRO mode, it can emulate a huge P2 card, recording at 100, 50 or 25 Mbps in the P2 MXF file format, or you can choose to record in QuickTime or RawDV. And in the DVCPRO/DV mode, you can choose from a long list of file formats and pick the one that suits your NLE.

Focus Enhancements calls this "Direct To Edit" technology, as it creates the specific file format used by individual NLE systems. After shooting, you just plug it into your NLE like any FireWire drive, and begin editing.

Although optimized for the Panasonic AG-DVX200, the FS-100 will also capture video from other compatible DV/DVCPRO/ DVCPRO 50 or DVCPRO HD Panasonic devices (decks as well) with a FireWire port.

The FireStore FS-100 adds tremendous value to the AG-HVX200 camera because it provides a large amount of inexpensive storage capability that P2 cards are not able to deliver at present.

The FS-100 provides 1.5 hours of DVCPRO HD recording time. With the latest version 3.0, you can record more than four hours of DVCPRO HD in the 720p (24, 25 or 30p) native mode.

The Focus Enhancements FireStore FS-100 hard drive recorder

FEATURES

The FireStore FS-100 is about 1.5 inches thick and weighs about a pound with the battery. It can be mounted on the camera or worn on your belt. It incorporates a sophisticated shock-resistant system that caches material that may have been disrupted, making it exceptionally durable in the field.

The FS-100 connects to the Panasonic AG-HVX200 through a standard FireWire cable that passes video, audio, timecode and control information. You can record from the camera to the disk only, or to both P2 cards (or tape) and disk simultaneously.

When shooting DVCPRO HD, files can be recorded at 100 Mbps in the P2 MXF file format, which is easily transferred into all of the major NLEs, or into QuickTime or Raw DV. Recording in QuickTime makes the files instantly usable in Final Cut Pro.

Unlike HDV, the FS-100 records full HD with 4:2:2 sampling and no long-GOP compression.

When shooting in DVCPRO/DV, you have a wide menu of formats in which you can record: QuickTime, QuickTime 24p, Avid OMF, Pinnacle AVI, P2 MXF, RawDV, AVI Type 1, AVI Type 2, AVI Type 2 24p, Matrox AVI, or Canopus AVI.

This allows you to take files directly from the FS-100 and place them on the timeline in your NLE.

The FS-100 includes a number of features that enhance field production. Each time you press record, a new file is created. You can even break

FOCUS, PAGE 48

FAST FACTS

Application
External DVCPRO HD disk recorder

Key Features
Supports multiple formats, more than four hours of DVCPRO HD recording time, low weight

Price
$2,195

Contact
Focus Enhancements
408-866-8300
www.focusinfo.com

Focus

CONTINUED FROM PAGE 47

a continuous shot into separate files by pressing the record button while the camera is recording.

The tapeless workflow requires vigilant data management, and the FS-100 is designed to start the process off right. The FS-100 lets you organize clips into "reels," which are essentially folders on the disk.

There are 10 reel folders that you can name to help keep track of your clips. Naming by such elements as scene, person interviewed, or time of day can keep your clips from turning into disorganized material and save time in editing.

The FS-100 has a prerecord function that caches video before you actually hit the record button. Depending on whether you cache to memory or disk, you can capture from six seconds up to the entire available disk space with prerecorded video in HD mode—handy if you're covering unpredictable events such as wildlife or building demolitions.

You can also record a continuous loop of video. And there's a time-lapse feature that can be set to record a specific number of frames per minute.

The FS-100 handles timecode with all of the options you would expect in a professional video camera. There's TC Rec Run, TC Free Run and TC Regen, along with drop frame or nondrop frame modes. And you have the ability to pre-set the timecode, which is vital for long projects where timecode numbers need to be ordered.

IN USE

The FS-100 is designed for ease of use. There's an LCD screen with a series of menus that are straightforward and quick to access. By using them, you can quickly change recording formats, select and view clips, organize clips, or switch to hard disk mode for transfer. You can edit from the FS-100 itself, or transfer the contents onto another drive via a Mac or Windows computer or laptop.

I tested the FS-100 with a Panasonic AG-HVX200 camera, which is what it's primarily designed for. With no prior experience in setting up a hard drive with a video camera, I was able to get operational very quickly. There is a certain amount of initial setup that is necessary. However, the instruction book is exceptionally well written, making the process simple and painless.

Once the FS-100 is set up, the recording process is basically the same as if one is using P2 cards. First, I selected the desired video format on the AG-HVX200 camera. This camera records in any format currently used, but I was interested in HD, so I started with 1080 60i. Next I chose the file format to record on the FS-100. I used P2, which records MXF files, because I was interested in comparing the FS-100 workflow with P2 card workflow.

I quickly discovered that you can change HD formats on the camera easily at will, and the FS-100 will faithfully capture the material. So, I recorded a series of clips, each in a different format: 1080 60i (30p, 24p and 24pa) and 720 (60p, 30p and 24p). With the FS-100, you can switch between desired formats and frame rates without switching off the camera.

I then connected the FS-100 to an Intel-based Mac Pro running Final Cut Pro 5.1. Final Cut reads the MXF files on the FS-100 as if they were P2 card files, making transfer of material exceptionally easy. One click brings up an import interface that lists all of the P2 clips. I selected the ones that I wanted to convert to the QuickTime format Final Cut uses, and they were quickly rendered and placed into the editing bin.

I also tested the FS-100 on Windows XP and Avid Media Composer. Getting P2 clips into the desired Avid project can be done by using the Media Tool.

For both Final Cut and Avid, the P2 MXF files have to be converted. The current FS-100 release 3.0, allows you to record in QuickTime HD, eliminating the conversion step when working in Final Cut Pro. The Avid OMF format is offered as a record file option when recording in DVCPRO DV, but not DVCPRO HD.

From the shooting standpoint, recording capacity is one of the major concerns when using the Panasonic AG-HVX200. This is where shooting in 720/24pn is an option.

When shooting in this format, data is conserved, as only the actual 24 frames needed are recorded to the drive. This increases recording time from one-and-a-half to more than four hours. But the best part is that it looks great.

To my eyes, 720/24pn footage looked as good as, or better than, any of the other modes. And it provides the smoothest emulation of 24 frame film that I've seen from any of the HDV cameras I've tested. Even after transferring to 720 60i, I did not see the motion stutter common in many other cameras and capture modes.

As a documentary maker who likes the film look, this is an ideal solution. With the FS-100, I can carry more than four hours of 720/24pn capacity in the field. When the drive fills, it is a simple matter to transfer it to a larger storage drive, erase the FS-100, and start fresh. And the 720/24pn from the Panasonic AG-HVX200 looks crisp and free of motion artifacts. Add a little cinema gamma, and it has many of the motion and color characteristics of film.

Recording to disk may cause some insecurity for videographers accustomed to tape. However, the FS-100 is very durable with built-in backup systems. At one point, I found that a file did not play back properly when I reviewed it through the camera. I went to the Repair Clip menu, ran the function and then the clip played back perfectly.

There is also a Repair Disk utility for fixing disk errors that might occur if, for example, you had loss of power during recording. In my test, I had no errors, and the FS-100 recorded all of the video flawlessly. And there is the major additional advantage in that direct-to-disk recording eliminates tape dropouts.

SUMMARY

The Panasonic AG-HVX200 is an amazingly versatile camera that is slightly ahead of its time. When the camera was introduced, many people marveled at all it could do, but were apprehensive about having an adequate supply of P2 cards for documentary work or other circumstances that require long shoots.

The FireStore FS-100 is the ingenious solution to this problem. If you are shooting full DVCPRO HD, you can have from one-and-a-half to four hours of recording time at full resolution and quality. It makes the AG-HVX200 a camera that you can buy now and use for any application, including documentaries. And, of course, you can use P2 cards as well, and buy more when they get cheaper and offer more capacity. But the FS-100 will always be a highly useful companion for this camera.

And finally, I have to say that the FS-100 is masterfully engineered for durability, quality and ease of use. A great deal of care, all the way from the manual to the LCD menus, went into making the FS-100 simple, efficient and elegant. It's one of the best products to hit the digital video market in many years.

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

P2 RECORDER/PLAYER

Panasonic AJ-HPM100

by Geoff Poister

The Panasonic AJ-HPM100 is a device that accepts P2 memory cards and emulates the functions of an HD videotape recorder and monitor with stereo speakers. It is designed to enhance the P2 workflow by enabling the user to instantly view video on a high-resolution LCD screen, choose clips for play-out and even perform basic editing functions.

It is ideally suited for news reporting, since one can quickly edit camera footage, record voice-overs and output in the desired HD or SD format. But it is also useful for transferring selected footage from P2 cards to disk, thus improving the efficiency of location shooting.

FEATURES

The Panasonic AJ-HPM100 is about the size of a brief case and weighs about 14 pounds. It opens to reveal a high resolution 9-inch monitor that provides crisp playback of all HD and SD formats directly from P2 card media.

The Panasonic AJ-HPM100 DVCPRO HD P2 mobile recorder/player

Six P2 card slots provide multiformat recording and playback of recorded media, as well as up, down and cross conversion between 1080i and 720p as well as between HD and SD formats. All of Panasonic's P2 cameras can record DVCPRO, DVCPRO 50 and DVCPRO HD, and the AJ-HPM100 mirrors that multiformat capability. Six 16 GB P2 cards provides 96 minutes of full DVCPRO HD recording. This capacity is constantly increasing and it is rumored that Panasonic recently annoounced that it plans to ship a 32 GB card by year's end. The cost of the media is decreasing as well.

The system is designed to be as foolproof as possible. You can record multiple clips, or a very long single clip across all six P2 cards if necessary. You can then remove the cards and reinsert them in any order and the data will be properly sequenced. The cards are hot-swappable, allowing you to insert or remove cards at will.

The AJ-HPM100 display screen provides a thumbnail image for each clip. When cards are inserted or removed, the thumbnail display automatically updates itself and sequences clips in the order in which they were created.

The thumbnail system provides a quick inventory of shots on the cards, but is ultimately designed for versatile clip management. Clips can be deleted, copied or merged and there is extensive metadata for each one. Information for each clip includes the length, format, date, time, and type of camera used.

To play back or record clips, the AJ-HPM100 is set up just like a VTR. There are the familiar play, fast-for-

PANASONIC, PAGE 57

FAST FACTS

Application
Solid-state HD videotape recorder emulation

Key Features
Accepts P2 memory cards, LCD viewing screen, stereo speakers, basic editing functionality

Price
$12,000

Contact
Panasonic Broadcast
800-528-8601
www.panasonic.com/broadcast

CAMERA HEAD/TRIPOD SYSTEM

Sachtler DV8 SB/Speed Lock 75 Tripod

by Carl Mrozek

All good camerapersons appreciate the virtues of a sturdy tripod. However, those of us who have to work as one-man bands, and who often have to cover a good deal of ground with camera and tripod appreciate the advances made with new age materials such as carbon fiber.

This technology has meant that sturdy is no longer synonymous with ponderous. In an ideal world, even fairly lightweight tripods and fluid heads would be up for the task.

However, when I read the specs for Sachtler's DV8 SB Speed Balance fluid head and Speed Lock 75 CF tripod), I realized that the ideal was already close to becoming real. As always the proof is in the pudding—in the field, working with professional cameras ranging from small (1/4-inch and 1/3-inch CCDs) to large (2/3-inch CCDs) under real world conditions.

DESCRIPTION

The DV8 SB fluid head has the distinctive muscular Sachtler look with the thick black cylindrical tilt mechanism perched atop the hemispheric bowl-shaped pan section—all characteristically slate black with the Sachtler logo prominently displayed on both sides.

The head itself weighs in at 5.5 pounds and the balance plate is 2.4-inches long.

Like all of Sachtler's new series of DV heads, the DV8 SB utilizes its patented Speed Balance technology, which features multiple discrete steps of counterbalance—12 steps for the DV8 SB.

This makes it possible to accommodate a broader range of payloads (from two to 26 pounds). As a result, lightweight camcorders like those in the DVCAM, HDV and DV classes can be more readily accommodated. In developing these new heads, Sachtler enabled camera operators to balance their cameras on the DV8 SB fluid head quickly and easily, step by numbered step. This graduated step-switching system of adjustment contrasts with stepless systems which often require repeated, tedious trial and error adjustments, partly due to the lack of clear, consistent, repeat-

The Sachtler DB8 SB Speed Head and Speed Lock 75 CF tripod system

FAST FACTS

Application
Professional grade camera support

Key Features
Sturdy, light and easy to carry, supports a range of camera packages

Price
$3,245 (order code 0850)

Contact
Sachtler
845-268-0100
www.sachtler.us

able counterbalance levels.

The DV 8 SB also uses the step switching method for drag control, albeit with a lesser number of steps—five stages of drag in both the vertical and horizontal planes.

Drag resistance increases in order of ascending numbers, from one to five. In other words, five is the maximum drag level for both pans and tilts. The DV series of fluid heads are all constructed with Sachtler's patented damping system.

This embodies a silicone-based viscous fluid to provide smooth, frictionless operation, without the use of hydraulic oil or other liquid or oily substance. This fluid is sandwiched between thin, high-performance plates all encased in a hermetically sealed module.

The unique properties of this viscous substance and the drag modules make them virtually temperature-independent. This means that the drag encountered at each of the five drag levels should be the same, or nearly the same, anywhere in the world, regardless of weather, temperature or environmental conditions—from polar ice fields to equatorial rain forests.

Moreover, this technology is employed in all Sachtler fluid heads, from the DV 1 to the Video 90, with fairly consistent results across that field.

The camera plate slides fore and aft about six cm and is calibrated and clearly marked for fast, exact camera placement. The rectangular camera base-plate adapter is only six cm long, but attaches securely to the tripod adapter plate with two setscrews.

A rear section of the sliding metal plate retracts just enough for the base plate adapter to slide in. When this spring-loaded plate is released, it grabs the beveled base-plate adapter securely and locks it down with a large red thumbnut. A spring-loaded pin within the thumbnut pulls down easily in order to release the plate.

The de-curved metal handle with a durable plasticine handgrip can rotate 360 degrees within its socket when unlocked, as well as at the attachment point on the fluid head to accommodate the maximum range of handle positions.

Moreover, these handle positions can be locked securely by a thick oversized wing-nut. Its size makes it surprisingly easy to unlock. The same is true for the extra long tie-down for the leveling ball, which extends six inches below the ball for easy grasping. A large oval handgrip at the end of the tie down facilitates fast, secure tightening and untightening of the leveling ball at any feasible angle.

The slate black 75 CF tripod features Sachtler's Speed Lock system, which is designed to facilitate fast deployment of the two-stage carbon fiber legs. Key to this is the locking lever, which releases both lower stages when unclamped, and locks the legs firmly in place when clamped down.

The Sachtler DB8 Speed Balance fluid camera head

The feet are double claw toes, but can be used with compact individual toe pads or a floor spreader when working on floors, pavement and other smooth, flat surfaces.

With all three leg sections fully extended, the Speed Lock 75 stands between 52 and 54 inches, depending on how far out the legs are spread. Due to the three-stage legs, it stands only 24 inches tall when the legs are compressed to one stage, but are fully spread.

The 75 CF is designed to accommodate Sachtler fluid heads from DV 1 through 8. Heads with greater payloads only come with 100 mm balls and hence require corresponding 100 mm tripods.

The 75 CF tripod is also equipped with the Mid-Level Spreader 75, made of aluminum. It attaches securely to the base of each first-stage leg with setscrews. The arms of the spreader are 10 inches long when fully extended, but compress by half to 5 inches from the hub. Unlike with many other spreaders, the arms need not all be horizontal to be effective, but can be locked securely, even when tilted upwards by up to 30 degrees or so.

There is also a key ring at the hub of the spreader for attaching ballast if extra stability is needed. There are two additional heavy-duty key rings at either end of the first stage legs for attaching a shoulder strap for easier transport.

IN USE

I tested the DV8 SB/75 CF tripod system, using both small and large camera payloads. For the small payload I used Canon's new XH A1 camcorder with fixed 20x lens and no other accessories. The total weight was slightly less than five pounds—more than double the minimum payload of 2.2 pounds.

After attaching the camera plate adapter to the base of the XH A1 via the smaller of the two setscrews (the other was too large), I put it to the test while shooting a few different subjects, in particular, middle school basketball.

The XH A1 and the DV 8 SB/75 CF seemed the ideal package for covering junior level school sports—primarily attended by family members and seldom covered by TV news. In this situation, the smaller camera was less distracting to the student players and their families and had less impact on how the game was played.

The first step was counterbalancing, which proved surprisingly easy when compared with the trial and error process associated with many other fluid heads. I simply locked the camera onto the top plate, slid it forward to the zero position and began dialing at the lower end of the 12-step counterbalance range.

Based on a weight of approximately five pounds, I started a few steps from the bottom—at step 3—and found this quite workable. However, in the interest of allowing "headroom," I notched it up to step 4. I did the same with the tilt drag level—starting at 2 on a scale of 5. I started at 2 for pan drag, again basing it on the assumption that the roughly five pound XH A1 was on the low, but not lowest end of the DV8 SB's counterbalance and drag payload range.

On my first outing with the DV8 SB and XH A1, I had to shoot from the bleachers, with at least one leg planted on a different tier of seating than the other two. With the flexible spreader and three-section legs and their individual pads, I was able to create a stable camera-mounting platform in what was otherwise a precarious position.

As the game wore on, I tweaked drag levels by up to two notches, when I needed a faster pan to follow the action down the court. The same

SACHTLER, PAGE 54

PRODUCTS & SERVICES SHOWCASE

PRODUCTS & SERVICES SHOWCASE

Sachtler

CONTINUED FROM PAGE 51

applied to tilts. When the action shifted to the far end of the court, I needed slower head movement vertically and horizontally.

When the action shifted to my end of the court, the same slow drag would often result in just missing the shot on the basket. In the end, I mostly stuck with a drag level of 3, both vertically and horizontally, but I occasionally bumped it up to 4 vertically for long down-court shots.

For another game, I had to adjust both the horizontal and vertical drag range downwards, when I was close to the action at floor level. This was a natural reaction to following the closer action, often fully zoomed out. As the action came to me and then sped past, I would have been behind the game if I hadn't lowered the pan drag to 2 to allow dribbled ball to be followed.

I also enjoyed the freedom of lifting the camera and tripod with one hand and running down the court to stay on top of the action. I could also quickly adjust leg height as needed, when doing new setups on the run.

I pushed the high end of the payload range for the DV8 SB by using a Sony DSR 570W camera mated with Fujinon's hefty 26x11.5 mm lens and powered by a Frezzi 100 W Li-ion battery.

The combined weight of the package was slightly over 20 pounds. For purposes of this evaluation I used this gear package primarily to capture wildlife, in particular, waterfowl.

To get to the action, I had to hike a half a mile or more on trails and over crumbling concrete piers with the camera and tripod slung over my shoulders. I'd already attached the Sachtler tripod adapter plate to the camera adapter plate using both fastening bolts provided.

The camera adapter didn't jiggle at all once it was locked on, even though it was about half the size of a typical 2/3-inch camera tripod

adapter plate. However, it did make the tripod a bit too top-heavy to carry on my shoulder with a shoulder strap not really designed for tripods.

I opted to carry it on my shoulder with the legs half extended, much like a set of short skis. It felt comfortably light when compared to the 100 mm fluid heads and non-carbon fiber tripods that I typically use.

When I first set the camera package on the Sachtler mount, the tripod didn't seem quite up to the load. However, this apparent fragility disappeared as soon as I set the counterbalance correctly. In setting it, I used the same simple logic as I did for counterbalancing the Canon XH A1.

With the Sony camera package weighing about 75 percent of the maximum payload for the DV8 SB, I started just a couple of steps below the top end of the 12-step range—at 10. Once again, this simple extrapolation proved an accurate predictor of the correct counterbalance. Level 9 almost worked, but not quite. Level 10 was adequate, however level 11 provided a bit of headroom and was my preferred setting.

Similarly in terms of drag, level 3 was serviceable for on- and off-camera tilting, but required extra effort. Much the same applied to panning—I started with 3, but found that level 5 gave me smoother and more consistent pans and tilts. This is based on my results when shooting gulls, waterfowl and other birds, both flying and swimming. In my estimation, the DV8 SB/75 CF system did a remarkable job, allowing excellent panning, tilting and counterbalancing of my 20-pound camera package, and even providing a bit of headroom. However, I would expect this headroom to fade with payloads much above this weight.

Setting up, breaking down and adjusting the DV8 SB package with the greater than 20 pound payload was a bit more challenging than with the five pound one, but not in any dramatic way.

The main difference was in exercising more care when unlocking and adjusting leg length. This was due to the downward pressure from the greater weight of the camera. It became especially critical when adjusting leg length and leveling the ball when I placed the tripod on the boulder-strewn edge of the breakwall flanking the cold, fast, deep waters of the Niagara River.

SUMMARY

In this era of rapid technological advancement, high-quality video cameras come in all sizes and shapes. Traditionally, this necessitates having a selection of camera support gear—really both impractical and costly, particularly for independents.

We have to carefully purchase flexible camera support systems that can comfortably accommodate cameras of various sizes—from only a few pounds to 25 or more. Sachtler's DV8 SB Speed Balance/75 CF tripod package does exactly this, as it can accommodate cameras weighing as little as 2.2 pounds up to those weighing in at 25 pounds or more.

Moreover, as the Sachtler gear tips the scales at barely 10 pounds, it's lightweight, compact and portable.

With three leg sections it compresses to a length less that two feet to make packing for travel easier.

This durable tripod is built for ease and speed of operation and should support the needs of many video pros at both the EFP and ENG ends of the spectrum. It seems capable of sustaining plenty of abuse without impairing its overall function.

Carl Mrozek operates Eagle Eye Media, based in Buffalo, N.Y., which specializes in wildlife and outdoor subjects. His work regularly appears on the Discovery Channel, The Weather Channel, CBS, PBS and other networks. Contact him at eagleye@localnet.net.

STORAGE ARRAY

G-Technology G-RAID2

by Geoff Poister

G-Technology was a pioneer in the development of FireWire-based RAID systems that challenged the performance and price of existing systems. Today, the company makes a wide range of disk storage systems, from simple but efficient low-cost units, to sophisticated Fibre Channel RAID systems offering maximum protection against data loss.

They are still pushing the market toward more affordable storage and have captured the eye of video producers looking for ways to manage HD production without taking out a second mortgage.

This review examines the more affordable end of their product line, the G-RAID2 series. These are RAID 0 systems that do not offer redundant drives and failsafe back-up, but do offer reliable, high-speed performance capable of handling compressed forms of HD post-production content. And they are backed by a two-year warranty that offers some peace of mind.

FEATURES

The G-RAID2 comes in four sizes: 500 GB, 640 GB, 1,000 GB and 1,500 GB. The arrays incorporate two 7,200 rpm SATA II hard drives, each with up to 16 MB of cache and the new Oxford 924 bridge chipset.

The term RAID stands for "redundant array of independent disks." RAIDs are primarily designed to offer greater speed and/or safety than a single drive. But not all RAIDs are created equal. For starters, they can be designed to provide varying levels of safety for data recovery in the event of a drive failure. The higher RAID levels protect data by employing technologies that can withstand one or more disk drive failures and still keep your data intact and online.

RAID 0 is a level that provides very high speed, but does not offer any backup in case a drive should fail. The computer sees the array as one large drive. But if a single drive in the array fails, you lose everything, just as if it were a single drive. RAID systems configured at higher RAID levels use various technologies, such as duplicating data, to ensure recovery if one or more drives should fail.

The G-RAID2 is a level 0 RAID, which means that you do not get the fail-safe protection of higher levels. So why choose it? As with most such decisions, it comes down to a cost and performance balance. In general, RAID 0 drives are faster and less expensive. So, if you are willing to take on some risk, or do your own data backup, you can work with a RAID 0 system, which costs significantly less than a fail-safe system. That, of course, does not mean that RAID 0 drives are not safe. They are designed to last, and G-Technology's two-year warranty indicates the company's confidence in their longevity.

The G-Technology G-RAID2 storage system

The G-RAID2 is designed for speed and versatility. It features a number of connections to match your system's needs.

The back panel has two FireWire 800 ports, one FireWire 400 port and one USB 2.0 port. To take advantage of the maximum speed, though, FireWire 800 is the hands-down choice, as it can reach a theoretical maximum data rate of 800 Mbps (100 MBps). A FireWire 800 cable is included with the RAID.

The FireWire 400 port is a viable alternative if you don't have an 800 port. At 400 Mbps (equal to 50 MBps) you are still within range of DVCPRO HD performance, but below the maximum speed of the RAID. USB 2.0 is the slowest and is better suited for backing up files than achieving real-time video editing performance.

When editing video, especially HD, speed is of paramount importance, and this is something that the G-RAID2 delivers. It will support three real-time streams of DVCPRO HD, four real-time streams of HDV, and seven real-time stream of DV25 when connected through the FireWire 800 port.

The G-RAID2 is housed in a rugged aluminum case with a cooling fan that fends off the heat buildup that can cause damage to hard drives. It is only about 9-by-5-by-3 inches and weighs just 3.85 pounds. It comes preformatted for Mac OS X, but can be quickly reformatted to any other system. If working on both Windows and Mac, there are formats, such as FAT 32, that work on either platform.

IN USE

I connected a G-RAID2 500 MB array via the FireWire 800 port to a Mac Pro with two 2.66 GHz dual-core Intel processors and 3 GB of memory. No driver or software installation was necessary. The G-RAID2 appeared on the desktop as a single drive, ready for use.

I have a number of various FireWire and USB drives that I have accumulated over the last couple of years and I was interested in comparing speed. In particular, I wanted to compare the G-RAID2 performance to another low-cost RAID system that I have.

I don't have any drive testing software for Mac, so to test the drive speeds, I switched to Windows XP using Apple's Boot Camp software that allows Windows to run on Mac. Using a disk drive speed utility I ran tests on all of my drives, including the G-RAID2, and the test was quite illuminating.

First, as a point of reference, it is interesting to note the transfer speed of some standard FireWire drives.

We tend to think of FireWire drives as "fast," but in actuality, the FireWire 400 drives are comparatively slow. They are very good for DV25 level video, and suitable for HDV, but clearly inadequate for the higher data rate demands of HD.

Two of my older FireWire drives showed a sequential read rate of about 6.6 MBps, sequential write of about 5.5 MBps, and random seek + RW of 2.3 MBps. Just looking at the sequential read rate, we can make some basic inferences about the video playback capability.

Standard DV25 needs a data rate of 3.6 MBps. So, a FireWire drive with a 6.6 MBps read rate can easily handle this. In practice, my basic FireWire drives can read and write multiple streams of DV25 with no problem. But if I try DVCPRO HD, it struggles to keep up, stopping and starting like a car running out of gas. (My older FireWire drives are more than half full. Bear in mind when testing drives that they become slower as they fill up. True cross comparisons should be made with empty drives.)

Next, I tested a new "Brand X" 1,000 GB RAID unit containing four drives. The numbers were decidedly better than the FireWire drives—sequential read: 38.5 MBps; sequential write: 13.8 MBps, and random seek + RW: 2.6. This drive is capable of handling DVCPRO HD as long as I don't tax it too heavily with real-time streams.

Now the G-RAID2. Its test results were—sequential read: 68 MBps; sequential write: 42.6 MBps; and random seek + RW: 3.5 MBps. These results show that the G-RAID2 is significantly faster than the Brand X RAID—68 MBps read as opposed to 38.5 MBps for the Brand X. It also shows that not all RAIDs are created equal. The G-RAID is engineered for speed and it achieves it in practice.

To test it further, I loaded some clips recorded on a Panasonic AG-HVX200 P2 camera in the MXF file format. I created two projects in Final Cut Pro, one in 720 24p and one in 1080 60i.

FAST FACTS

Application
Low cost RAID storage

Key Features
High capacity and speed data storage, multiple ports

Price
$399 (500 GB model); $699 (1,000 GB model)

Contact
G-Technology
310-449-4599
www.g-technology.com

The G-RAID2 handled the media effortlessly. I pushed the limits with three layers of video and some effects and found that the drive achieved its claim of handling up to three layers of real-time DVCPRO HD streams. And finally, I did a simple data transfer test for a final comparison between the G-RAID2 and my Brand X RAID. The G-RAID2 transferred a 670 MB file from my C drive in 27 seconds. The same file took 50 seconds to transfer on my Brand X RAID—almost twice as long.

SUMMARY

My test of the G-RAID2 showed that this system is very fast and well suited for the demands of DVCPRO HD editing. It is an outstanding value for the price. I am not aware of another RAID system on the market that offers this kind of speed for a price as low as $699 for a terabyte of storage.

The G-RAID2 is built for speed, and is as reliable as any drive on the market. However, if one is concerned about safety and the ability to recover from a drive failure, it is worth looking at other products in the company's lineup. Several of their products offer RAID 1 through 6 protection. But if one is diligent about backing up critical data, the G-RAID2 can offer the speed to handle HD at a fraction of the cost of fail-safe systems.

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

Panasonic

CONTINUED FROM PAGE 49

ward and rewind buttons, and even a jog and shuttle control. But you also have the advantage of random access, allowing you to locate any clip on the thumbnail screen and instantly view it.

The AJ-HPM100 is also a basic NLE. By setting in and out points within clips, you can mark up to 100 events and play them out in any order in real time.

Audio features are also versatile. The AJ-HPM100 provides eight channels of 16-bit audio. The back panel includes four XLR input and output connectors. You can even do audio dubbing, adding up to two channels of audio mixed with the original sound on video. This is a feature ideal for fast editing of material for breaking news.

The AJ-HPM100 also serves as a bridge between the video and computer arenas by offering HD-SDI, IEEE 1394, and USB 2.0 outputs.

You can connect a hard disk drive to transfer clips from the P2 cards through the USB 2.0 port, or you can connect the AJ-HPM100 to an NLE and edit directly from the data on the cards. The IEEE 1394 interface can be used to connect the AJ-HPM100 to a DVCPRO HD camera, turning it into a versatile digital recording device. And finally the HD-SDI interface allows integration into studio, editing or broadcast environments.

The AJ-HPM100 is designed to accept an optional card that employs a new codec, AVC-Intra. AVC-Intra is an intraframe compression method that delivers DVCPRO HD quality at half the data rate, effectively doubling the recording capacity of the P2 card media. So, instead of recording 96 minutes of full DVCPRO HD on six 16 GB cards, you can record almost three-and-a-half hours.

The AVC-Intra codec can be used at two data rates. Choosing the 50 Mbps rate provides DVCPRO HD quality, and the 100 Mbps rate approaches D-5 quality for situations that demand the highest quality possible. This means that the AJ-HPM100 can serve as a D-5-like recorder, a feat that is remarkable for the price.

Furthermore, it is worth noting that AVC-Intra is an advanced compression method based on the MPEG-4 Part 10 H.264 codec. It does not use the long-GOP method that MPEG-2 relies upon, and hence avoids some of the disadvantages of multi-frame compression. It requires a higher data rate than MPEG-2, but that is not a problem for the P2 card systems, as they easily handle 100 Mbps, and it is not necessary to constrain the data rate. The 50 Mbps option, however, offers the advantage of DVCPRO HD quality while maintaining economy of storage capacity.

IN USE

I took several P2 cards that I had used while testing the new Panasonic AJ-HPX2000 HD camera and placed them into available slots on the AJ-HPM100 P2 recorder/player. As it is set up to look and work like a traditional VTR, I was instantly able to view the clips I'd shot without reading the manual. The pause and shuttle controls are precise and it is easy to locate any portion of a clip.

I found that having an instant thumbnail library of recorded clips was like having a clip bin in an NLE. I could select any clip, regardless of its position on the list, view it instantly and then return to recording. With tape, it is unthinkable to rewind to the beginning to check a shot. With P2 recording, you can check anything anywhere on the card and instantly return to shooting without fear of recording over something.

The basic editing functions are useful and also offer many possibilities. But they do take a little time to learn. While I was able to master making a simple playlist quickly and intuitively, it took more practice to select in and out points to create an event list.

Be prepared to spend a little time learning the more advanced functions such as clip editing and audio dubbing. Also, some functions, such as accessing clip metadata, are imbedded in the menu and one has to get accustomed to the branching necessary to reach the destination. That said, the AJ-HPM100 does everything it is advertised to do, and with familiarity it becomes simple to use.

The beauty of this device, though, is that it covers so many bases. Its high quality display is great for instant evaluation of footage shot in the field.

Its editing capabilities make it possible to delete, combine or select portions of clips, create a play list and save the desired material to hard disk. The P2 cards can then be erased and placed back into the camera for more shooting. And because Panasonic's P2 cameras and the AJ-HPM100 are hot swappable, all of this can be done without interrupting the shoot.

Also, the AJ-HPM100 makes the transition to an NLE very efficient. A simple connection of the USB 2.0 port enables you to immediately begin editing footage on any of the major NLE systems.

SUMMARY

Basically this is a high-definition VTR, HD monitor, basic NLE and P2 memory card transfer station all rolled up into one unit. One huge advantage is that there are no moving parts, virtually eliminating the wear, maintenance costs and downtime associated with tape-based systems. Its ultimate value, however, lies in how it facilitates media management.

Shifting from a tape-capture paradigm to a memory card workflow requires a shift in thinking. The process of working with clips on memory cards is more similar to digital asset management than what we are accustomed to with tape and film.

It is all about transferring data and processing it with computers. However, that is where video production is headed, and this is an instrument that is leading the way.

One can shoot on P2 cards and edit a product on an NLE without using the AJ-HPM100. But the AJ-HPM100 is a very useful intermediate between camera and play-out by providing a tool for versatile recording, as well as organizing and consolidating footage. In high-end production environments it vastly improves media flow and quality monitoring. Those working in news will probably find the strongest use for it by gaining the ability to cut and broadcast in the field.

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

CAMERA SUPPORT

Steady Stick Camera Support System

by Stephen Murphy

The Tiffen-distributed Davis & Sanford Steady Stick camera support system has been around for some time. In fact, I recently spotted a Steady Stick press blurb while flipping through a 1998 NAB Daily (I was actually doing research—I'm not *that* much of a nerd). In the intervening years since its release, this belt-supported monopod has undergone some significant improvements and now there are two versions available—the Steady Stick Compact and the Steady Stick Pro.

FEATURES

Both Steady Stick systems are comprised of four individual parts that assemble into a belt-attached monopod camera support. These four elements include a belt with a receptacle for the monopod; an extendable monopod; a camera plate assembly; and an associated padded support handle.

The Compact and Pro versions of the Steady Stick differ only in the plate assembly, with the former equipped with a standard tripod plate and camera screw for use with smaller prosumer camcorders (and still cameras), and the latter equipped with a 3-by-4-inch plate with multiple screw holes to accommodate a variety of professional video cameras and quick-release systems.

The Pro model is equipped with a 7-inch support bar that extends from the camera plate out towards the lens. It has an 8-inch, heavy-duty (1-inch diameter solid aluminum) handle with padded grip. The coupling end of the handle is equipped with a clever, semi-quick release spring-loaded screw for fast reconfiguration in a variety of orientations. The Compact plate includes a screw-in "ice pick-type" padded handle (the kind commonly found on still-camera tripods).

The system's 2-inch-wide woven nylon belt can be adjusted from approximately 30 to 48 inches, and is secured with a plastic snap-in buckle. The monopod receptacle is attached to a 3-by-3-inch neoprene-backed aluminum mount with a feedthrough, so that the whole assembly can slide around to preferred positions along the belt. The monopod receptacle, which resembles a wall flagpole mount, can swivel 360 degrees around the mount and can be angled from perpendicular to the ground to approximately 30 degrees out from the user's waist.

The telescoping monopod extends from 18 to 28 inches. The lower rod is secured on the waist end via a brass screw that locks into a groove cut in the rod. The top of the monopod attaches to the camera plate assembly via a spring-loaded quick release mechanism.

FAST FACTS

Application
Portable camera support and stabilization

Key Features
Belt-supported monopod system, quick release camera plate assembly mechanism, supports up to 30 pounds, heavy-duty woven nylon belt, adjusts from 18 to 28 inches, weighs 3 pounds.

Price
Steady Stick Compact $179; Pro $249

Contact
The Tiffen Co.
631-273-2500
www.tiffen.com

IN USE

For this review, I used the Steady Stick Compact with the Canon XL1 DV and Sony HDR-FX1 HDV camcorders. With the Steady Stick Pro, I used a Sony DSR-450WS DVCAM camcorder equipped with a Fujinon A20x8.6BRM lens. Though the Steady Sticks came with no instructions or manual to speak of, assembly was straightforward, with only one way the parts can possibly fit together.

In order to get up to speed quickly, I had the benefit of knowledge from a local camera op colleague and Steady Stick enthusiast, Michael Joy. He has been using the Steady Stick in all its incarnations since its introduction.

He frequently shoots for CNBC, and one of his regular calls is at "Pebble Beach" on the White House lawn (anyone who has seen the White House from the Pennsylvania Avenue side will instantly spot all the camera gear set up along the gravel and covered in weather protection).

Joy regularly uses his Steady Stick Pro while pulling White House duty to get tripod-like shots in areas where tripods are not allowed.

With both Steady Stick systems the procedure is the same—strap on and adjust the belt; insert the monopod and tighten the locking screw; pop the camcorder (with plate assembly already attached) onto the quick release mechanism on top of the monopod, and you're ready to go. With the Compact, a standard camera quick release can be mounted on top of the plate for quick transfer to a tripod (equipped with a duplicate QR system).

Cameraman Claus Harding tries out the Steady Stick at the National Press Club in Washington.

On the Pro model, the assembly plate/support bar can be left on the camcorder at all times by sandwiching the plate between the camera and its associated quick release wedge—screws are included. (Be sure that the additional thickness doesn't cause the QR to lever slightly out of the locking mechanism on the tripod.)

There was a very slight misalignment (elevation) problem with the Sony DSR/Vinten tripod system I was using with the Steady Stick plate in place—nothing that worried me at the time, but something that might get worse over time.

After a short initial trial of the Compact and Pro Steady Stick systems, I immediately felt comfortable with their general concept and use. It was instantly apparent that one of these would be a very useful device to have in the kit bag.

After a little more use, it occurred to me that, at street prices of around $200 and $149 for the Pro and Compact respectively, it'd be a serious oversight not to have one at the ready. The potential value in day-to-day operations far exceeds the cost—not an observation I will admit to having made very often.

It takes some experimenting to get comfortable with all of the positional possibilities available when in use, and how to quickly dispense with it (or make it less obtrusive) when switching back to tripod. Certainly when working with the SS Pro and the Sony DSR-450WS, the best place for the belt receptacle was on my right hip, with the pod extending outward at an angle, the camcorder on my shoulder and my left hand on the padded handle.

With a little adjusting of angle and rod height, the camera sat comfortably on my shoulder, but with all the support coming from the belt. The best part is, there's no strain on my back! This last part is a particular blessing, as I am frequently bothered by an old fractured-vertebra injury.

Basically, a lot of weight (including my pulling downward on the camera, and the camera itself) can be put upon the belt for producing shots nearly as steady as those from a tripod. (This is even better on cameras with stabilization, and waaaay better than going handheld.)

The Pro model, in combination with the DVCAM, worked great in the usual shoulder-mounted configuration. I found the Compact model, in combination with the two smaller camcorders, to be more flexible in providing a greater variety of steady-enhanced shots. Of course, this is more a function of the size, weight and typical use of the prosumer camera models, and not necessarily related to the Steady Stick itself.

The glaring problem with the Compact model is that the camcorder rests on bare metal and is secured only by the center mounted camera screw—no hole for a locking pin/screw, no washers, and no cork or neoprene padding on the surface—so the small camcorders could never be tightened and seated sufficiently to stop them from twisting about the center screw. Easy to fix, but a headscratcher as to why it hasn't been done in all these years.

SUMMARY

The Steady Stick Pro model sidles in perfectly and unobtrusively into the usual shoulder-mounted handheld routine. Its not so bulky or bizarre as to attract undue attention from subjects (or colleagues!) and its quick release mechanism allows fast switchovers to and from a tripod. The Steady Stick Compact, in combination with smaller camcorders, provides a variety of shot choices and configurations. Both models are inexpensive, provide an impressive amount of stability—far better than handheld alone—and take a tremedous amount of strain off our backs. They're easily worth the price of admission!

Stephen Murphy is a technical engineer at the National Press Club's Broadcast Operation Center, and an independent videographer/audio engineer with more than 20 years of broadcast and production experience.

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Graham Patten D/ESAM 820 digital audio mixer, BO; ADC DAL3-14MKIINS digital audio patchbay, $350; GVG 8550 tray w/8-8551 audio DAs, $800; Sony MXP-744, 36-input, BO; NVision NV1000 tray w/11-NV1035 20-bit AES3 A to D, BO; SSL Aysis Air Digital Mixer w/hub router, 40 faders, call for price. 908-879-9590 or www.mccominc.com.

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Sachtler 30 head & sticks, $4995; Sony Cine Alta XDCAM HD PDW-F330 new demo unit, full warranty, Only $9,900; Sony BVP-50 Camera Head, $2750; BTS LDK93 w/Studio VF, Fujinon BEVM 15X lens, CCU & Paint Panel, (steal this camera), BO; Sony LDK 90 w/Studio VF, Fujinon BEVM 15X lens, CCR & Paint Panel, BO; Hitachi C2 Camera w/Canon J15 lens, BO; Sony AC550 Power Supply, Make an Offer; Sony VA500 Color Playback Adaptor, $1000. LA 818.788.4700; NY 212.564.9933 www.tvprogear.com

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CERTIFICATION

www.tvtechnology.com

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Chyron Duet, $6,000; Chyron Infinite SDI, last used on Regis and Kelly show, BO. LA 818.788.4700; NY 212.564.9933 www.tvprogear.com

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Panasonic BT-LH2600W 26" multi-format LCD, new, call for price; Sony Sony PVM-15L5 w/BKM-120D, $2300; Ikegami TM20-20R w/SDI option, BO; (4) Sony PVM-14M4U, $975/ea; Sony BVM-14F1U, BO; Sony BVM-14E5, BO; (2) Sony BVM-20F1U, $2100/ea; (2) Sony BVM-20E1U, $2300/ea; (15) Sony PVM-96 9" BW monitor w/16:9, BO. 908-879-9590 or www.mccominc.com.

SIGNAL PROCESSING

Want to Sell

Convergence ECH-HD large HD playout turnkey system, $31000; Darim Vision FDSR2000 playout turnkey system, $11995; Convergence ECS-550LT Media Lite D.Co 1 chnl TV automation turnkey system, $7395; Convergence ECS-650P Digitizer Pro Media D. Co TV automation turnkey system, $39885; Chyron INFINIT! CG, $7999; Chyron MAX CG, $3690; D.Co MediaPlay CG, $2395; DaVinci 2K 3 Power tiers color corrector, BO; Blackmagic Multibridge HD-SD encoder/decoder, $1795; Darim Vision MV401exp, $6995; Darim Vision MV410EXP, $6495; Leitch FR-6802 w/10 VSM-6801 serial DA, $3000; Tekniche Genesis 6001, $1600; Tektronix 2715, $8500; Sony HKDV501A, BO; Digital Vision DVNR1000 4x4 NR, BO; GVG M9131 SDI DA, $150; GVG 9560 PAL sync gen, $1150. 818-551-5858 or 212-268-8800 or www.broadcaststore.com.

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SWITCHERS

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Thomson 9200 8-input SDI switcher, BO; BTS DD10 16-input SDI switcher, BO; Echolab DV7 Switcher, BO. LA 818.788.4700; NY 212.564.9933 www.tvprogear.com

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Snell & Wilcox Kahuna 4 M/E HD/SD switcher, BO; GVG M-2100 master cntrl switcher, $19600; GVG 100N prod switcher, $2499; GVG IPS-110 prod switcher, $6999; Sony DVS-8000C 2 1/2ME standard def prod switcher, BO; GVG 20-TEN w/20-TenOSA stereo audio routing switcher, $5500; GVG 7000 very large matrix w/SDI video routing switcher, $85400; GVG Series 6000 32x32 VAA w/5 panels routing switcher, $8600; Leitch 128x64 V6 Integrator w/10 panels, $31500; Leitch 16x1 routing switcher, $1100; Lighthouse K Series 32x32 SDI vdieo, AES audio routing switcher, $11000. 818-551-5858 or 212-268-8800 or www.broadcaststore.com.

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Needed, 700' of 3" antenna transmission hard line, also xmtr for TV chnl 31 & if you are changing to HDTV studio equip, we could use analog bdct equip for our not-for-profit 501-c3 org, we give tax deductible receipt for your donations. Please contact us at 317-920-1000 or email srsue@catholic-television.tv.

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Thomson Shadow complete telecine suite, $725000; GVG Spirit, BO. 818-551-5858 or 212-268-8800 or www.broadcaststore.com.

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Leader 5850c. $750; Leader LV 5100D, $3495; Leader LV-7700 HD/SD rasterizer, (new) $6,500; Tektronix TSG170D Digital Composite Generator, $1500; 171 PAL sync generator, BO; TPG625 PAL pattern generator, BO; SPG 271 PAL sync pulse generator, $2250; TSG 371 PAL test signal generator, $1200. (2) TSG422 w/ECO changeover unit, $2500. LA 818.788.4700; NY 212.564.9933 www.tvprogear.com

Tektronix 1750 combo wfm/vec, $1000; Tektronix 1740 combo wfm/vec, $900; Tektronix 1735 NTSC/PAL wfm, $950; Tektronix 1730D wfm, $950; Tektronix 1730/1720 wfm/vec, $850; Tektronix WFM-610M SDI wfm/vec, $5000; Tektronix 1750A combo wfm/vec, $2500; Leader LV-5700A HD/SDI wfm/vec, BO. 908-879-9590 or www.mccominc.com.

Tektronix 1720 vectorscope, $900; Tektronix 1730 waveform monitor, $900; Tektronix WFM-601E waveform. $5200; Tektronix WFM601i waveform, $3750; Tektronix 1740A waveform/vector, $2950; Tektronix 1750A waveform/vector, $3800; Tektronix VM700A, BO. 818-551-5858 or 212-268-8800 or www.broadcaststore.com.

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Want to Sell

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

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Want to Sell

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Panasonic AJ-HD2700P w/down converter board D5 VCR & EQ, $22900; Sony BKFC-200 Playback systems parts, $4500; Sony BVU-950 3/4 U-Matic VTR/editor, $1799; Sony DNW-A220 Betacam edit system, $10650; Sony BVW-75 Betacam editor, $7250; JVC BR-D750U D9 digital-S editor, $3750; JVC BR-D350U D9 Digital-S plyr, $2250; Sony SRW5500 HDTV rcdr & plyrs, BO; Sony DIR1000H, new, BO. 818-551-5858 or 212-268-8800 or www.broadcaststore.com.

Sony UVW1800 Betacam SP Recorder, $3995; Sony BVW 75 Betacam Recorder, $4950; Sony DSR-80 DV Cam VCR, $3500; Sony SVRM-100A remote for UVW series VCRs, $200; Sony VO 9850 ?" U-matic recorder, $1500; Sony SVO5800 S-VHS Editing VCR, $1250; Panasonic 7350 S-VHS Editing VCR, BO. LA 818.788.4700; NY 212.564.9933 www.tvprogear.com

Panasonic AJ-HD3700B, new, call for price; Sony UVW-1800, $3500; Sony BVW-70, $4500; Sony DVW-A500, call; Sony PVW-2800, $4500; Sony UVW-1400A PAL, BO; Panasonic AJ-D580, BO; Panasonic AJ-D351, BO; Sony BKDW-515, $2000. 908-879-9590 or www.mccominc.com.

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HELP WANTED

SOLUTIONS ARCHITECT; BROADCAST SYSTEMS: Quantel, Inc., a North American subsidiary of the UK based Company Quantel, Limited is a global, leading edge provider of television news and sports, post production, and film technology solutions. Quantel, Inc. is currently recruiting a Broadcast Solutions Architect (BSA) to join our Sales team in the USA. Reporting to the Chief Executive Officer this person will be required to work as part of a team to effectively evaluate, propose, negotiate and close major broadcast systems business within North America. The qualified candidate will analyze the prospect's application, requirements and workflows. The Solutions Architect, working in tandem with the Regional Sales Managers will provide a strategy to approach all levels of the account. The Solutions Architect must understand, influence and respond to the prospect's needs, counter objections, negotiate and assist the Sales Managers in the completion of the sale. The Solutions Architect will be the technical expert on the Quantel team. He or she will add value to the prospect by consulting on the full end-to-end requirement, inclusive of interacting with legacy systems already on-site where applicable. As the technical authority related to all aspects of the Quantel solution the BSA will define the scope of work, which will determine the overall cost and bill of materials required to satisfy the application. The Solutions Architect will ensure that the design, commercial, and technical assessments are documented and that any risks to the Company in pursuing systems business are identified, managed and mitigated. Apart from having excellent core skills the ideal candidate will require solid organizational, communica-tion and interpersonal skills, and deliver within timescales. Extensive travel is an essential part of this role. All interested parties please contact Ms. Aga McDonie, Office Manager at 703.448.6780 or aga.mcdonie@quantel.com.

TV Maintenance Engineer KQED San Francisco: Non-exempt union (NABET) position. The TV Maintenance Engineer is responsible for the routine installation, repair and maintenance of all broadcast and production equipment for the station including automation equipment, video servers, digital switchers, network and fiber paths, cameras, audio, microwave and satellite equipment, digital and analog. This position will work with the Director of Engineering Facilities Manager and other Lead engineers to ensure maximum quality and reliability of NCPB's services to the community. Applicants should have a minimum of 5 years experience in television systems maintenance. Must be well trained and experienced with computers, systems and networks. Experience with broadcast equipment a must. Excellent diagnostic, problem solving skills. Ability to frequently sit; ability to occasionally walk, stand, bend, and ability to occasionally lift up to 50 lbs. Valid drivers license required. Send cover letter and resume with salary requirements to: hr@KQED.org. Resumes can be mailed to HR Dept., KQED, 2601 Mariposa St., San Francisco, CA 94110 or faxed to 415-553-2183.

Broadcast Engineer WUSF Public Broadcasting , Tampa, Fl. seeks dynamic individual to operate studio and engineering plant equipment and systems, operate CADD drawing and station design, diagnose failures and malfunctions and repair of equipment and systems, adjust systems, and other routine maintenance procedures. Must have thorough understanding of electronic circuit theory and be able to troubleshoot, diagnose and handle the tools necessary to repair studio/ transmitter equipment. Scheduled work shifts with logs and the daily maintenance of systems and equipment data bases and documentation is also required. ACAD experience is a plus. For more details, visit website at www.wusf.org To Apply: Email cover letter and resume, with application to HR@wusf.org Download application off the USF website at www.usf.edu

TV TECHNOLOGY

Maintenance Engineer Transmitter/Studio KTEH San Jose, CA: The TV Maintenance Engineer-Transmitter/ RF is responsible for the routine installation, repair and maintenance of NTSC analog and DTV Transmitters and broadcast equipment for the station including automation equipment, video servers, editing systems, production switchers, cameras, audio, microwave and satellite equipment, digital and analog. Applicants should have a minimum of 5 years experience in transmitter maintenance. Must be well trained and experienced with broadcast equipment. Transmitter maintenance experience a must. Excellent diagnostic, problem solving skills. Ability to frequently sit; ability to occasionally walk, stand, bend, occasionally lift up to 50 lbs. Valid drivers license required. Send cover letter and resume with salary requirements to: hr@KQED.org. Resumes can be mailed to HR Dept., KQED, 2601 Mariposa St., San Francisco, CA 94110 or faxed to 415-553-2183.

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PAGE	ADVERTISER	WEB SITE
15	ADC	www.adc.com
52	AJA Video	www.aja.com
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52	Compuvideo Co., Ltd.	www.compuvideo.com
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55	Digital Broadcast, Inc.	www.digitalbcast.com
29	DMT USA, Inc.	www.dmtonline.us
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7	Fujinon	www.fujinon.com
34	Gepco International, Inc.	www.gepco.com
1	Harris	www.broadcast.harris.com
33	Harris	www.broadcast.harris.com
68	Harris	www.broadcast.harris.com
52	Hoodman Corporation	www.hoodmanusa.com
47	Hotronic, Inc.	www.hotronics.com
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2	Miranda Technologies	www.miranda.com
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54	RF Central LLC	www.rfcentral.com
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Tribune Agrees to Zell's $8.2 Billion Bid

CHICAGO

Tribune Co. has accepted an offer from real estate magnate Sam Zell that will take the company private.

The deal with Zell is valued at about $8.2 billion and will take place in two parts. The first stage of the transaction involves a cash offer for about 126 million shares at $34 per share. The offer will be funded by incremental borrowings and a $250 million investment from Zell. It's expected to be completed in Q2. Zell will make an additional investment of $65 million in a second stage, which is expected to close in Q4.

Tribune, which owns 23 television stations, also plans to sell the Chicago Cubs baseball team in a separate deal at the end of the 2007 season. The company said proceeds of the sale would go toward its debt.

Upon completion of the deal, the company will be privately held, with an employee stock ownership plan holding the majority of the shares and Zell holding the rights to acquire 40 percent of Tribune's common stock.

Zell will also join the Tribune board upon completion of his initial investment and become chairman when the deal closes. The company will be led by a board of directors with an independent majority. Tribune President and CEO Dennis FitzSimons will remain a member of the board, along with at least five independent directors and an additional director affiliated with Zell.

"As a private company, Tribune will have greater flexibility to transform our publishing/interactive and broadcasting businesses with an eye toward long-term growth. Importantly, our employees will have a significant stake in the company's future," FitzSimons said.

The board has agreed to approve the deal. However up to the time of shareholder approval, Tribune's board of directors will be entitled to consider alternative proposals.

In the event another proposal is selected, Zell's breakup fee would be $25 million.

The group has been reviewing proposals since the fall, including one from Los Angeles billionaires Eli Broad and Ron Burkle. The Tribune reportedly said it would make a decision by March 31 over the fate of the company. The merger will be subject to Tribune shareholder approval, FCC and other regulatory approvals.

Tribune has financing commitments from Citigroup, Merrill Lynch and JPMorgan Chase to fund the transactions.

Discovery Trades Off Travel

SILVER SPRING, MD.

Discovery Communications Inc. agreed late March to trade Travel Channel plus cash to Cox Communications for that company's stake in Discovery.

Cox, the nation's third-largest cable company, now holds a 25 percent piece of Discovery, which signed a letter of intent to swap Travel and $1.275 billion in cash for it. Cox, based in Atlanta, will also get the cable channel Web site and Antenna Audio, a company that specializes in audio and multimedia tours for museums and other facilities.

"This proposed transaction will simplify Discovery's ownership structure, further streamline our operations and give the company more strategic flexibility," said David Zaslav, the former NBC Universal executive who was named president and CEO of DCI in November. Zaslav began making his mark on the company in December when he did away with the education department, and later let go of several senior executives.

The swap with Cox, valued at around $2.5 billion and expected to be wrapped up by mid-May, will leave Discovery with two major shareholders—Denver cable titan John Malone and Advance/Newhouse.

Malone controls 50 percent of DCI through Discovery Holding, a publicly held spinoff of Liberty Media. After the deal with Cox, Malone's chunk will increase to 66 percent. Advance/Newhouse will hold 33 percent of DCI after the deal, up from 25 percent.

The swap, subject to the usual due diligence, will give Cox its first major, nationally distributed cable network. Travel Channel has about 84 million U.S. cable and DBS subscibers, and C-band users.

Intelsat Results Reflect PanAmSat Buy

PEMBROKE, BERMUDA

Intelsat pulled in revenues of $1.7 billion in 2006, up more than 40 percent from $1.2 billion in 2005. The boost reflects the company's July acquisition of PanAmSat, which contributed $457 million to overall revenues. EBITDA—earnings before interest, taxes, depreciation and amortization for the year came in at $1.1 billion.

Net loss for the year ending Dec. 31, 2006, came to about $369 million compared to $325 million in 2005. Intelsat said the 2006 net loss includes a $49 million write-down on the book value of IS-802, its bird that went on the blink last September; as well as other losses related to an investment in WildBlue Communications, the satellite broadband company.

It also reflects $26.5 million in restructuring costs related to absorbing PanAmSat, which also yielded an $8.1 billion revenue backlog of video distribution contracts.

"We are now operating four of the prior PanAmSat satellites from our operations center in Washington, D.C., and expect to transition another three within the next three months," said David McGlade, Intelsat CEO.

"Our planned service offerings will provide solutions for wireless applications, maritime requirements and IP-based services demanded by the 'new telecom' community," he said.

For the fourth quarter, the company reported revenues of $543 million, with a net loss of $63.4 million. EBITDA for the quarter was $387.5 million.

Free cash flow from operations for the year came in at $296.5 million.

In various service categories, Intelsat said its lease revenues increased by $451 million to $1.2 billion for 2006, compared to $759 million in '05. Managed solutions revenue increased $62 million to $173 million; channel revenue decreased by $19 million to $204 million; and MSS and other revenue decreased $3.4 million to $74.6 million.

Total operating expenses for the year incrased by $177 million over the previous year to $1.26 billion in 2006.

The company said that since Dec. 31, it has ordered two replacement satellites and a ground spare, in addition to outstanding orders for five satellites.

All are expected to be built over the next three years. Intelsat said it also has contracted for enough launch capacity to put three birds into orbit this year. As a result, the company said its '07 capital expenditures would total around $615 million.

Lin TV Sells Puerto Rico Operations to InterMedia

PROVIDENCE, R.I.

LIN TV Corp. has completed the sale of its Puerto Rico operations to InterMedia Partners VII, a private equity investment firm for $130 million in cash.

LIN TV owns and/or operates 29 television stations and 30 Web sites. The stations sold include WAPA-TV, a full-power independent station, and WJPX-TV, an independent station branded as MTV Puerto Rico, as well as WAPA America, a U.S. Spanish-language cable channel.

The deal is subject to certain adjustments. The company said it plans on using the proceeds from the sale to reduce its outstanding borrowings.

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