

Broadcast Engineering®

THE JOURNAL OF DIGITAL TELEVISION

Las Vegas

NAB 2006

REPLAY

- Pick Hits
- Product Jackpot
- Technology Seminar

SPECIAL REPORT:
Severe weather systems

NAB 2006
THE WORLD'S LARGEST ELECTRONIC MEDIA SHOW

NAB 2006
THE WORLD'S LARGEST ELECTRONIC MEDIA SHOW



THIS IS NOT AN AUDIO CONSOLE



D-9

IT'S A DIGITAL CONTROL SURFACE

THE D-9 interfaces to WHEATSTONE's router-based BRIDGE MIXING SYSTEM—a digital network that lets multiple control surfaces share common audio resources, accessing signals and sending mixes throughout your facility.

Production

OTHER SURFACES can share common audio resources

Studio2

I/O CONNECTIONS can be at point-of-use and accessed by any control surface

DEDICATED DSPs and controls, recundant automatic failover CPUs, mix engines and power supplies are all integral to the system. Components interconnect via CAT5 or fiberoptic cables for single-wire system integration.

A traditional intuitive surface layout gets your operators up and running FAST—even in full 5.1 surround mode.

TRUE RELIABLE mixing power; ease and clarity of operation—take **ADVANTAGE** of the **WHEATSTONE BRIDGE** Network System!

CENTRAL FRAME can control a 1024 x 1024 mixing based router

Engineering

Engineering

Talk to your **STATION ROUTER** bi-directionally for smooth integration

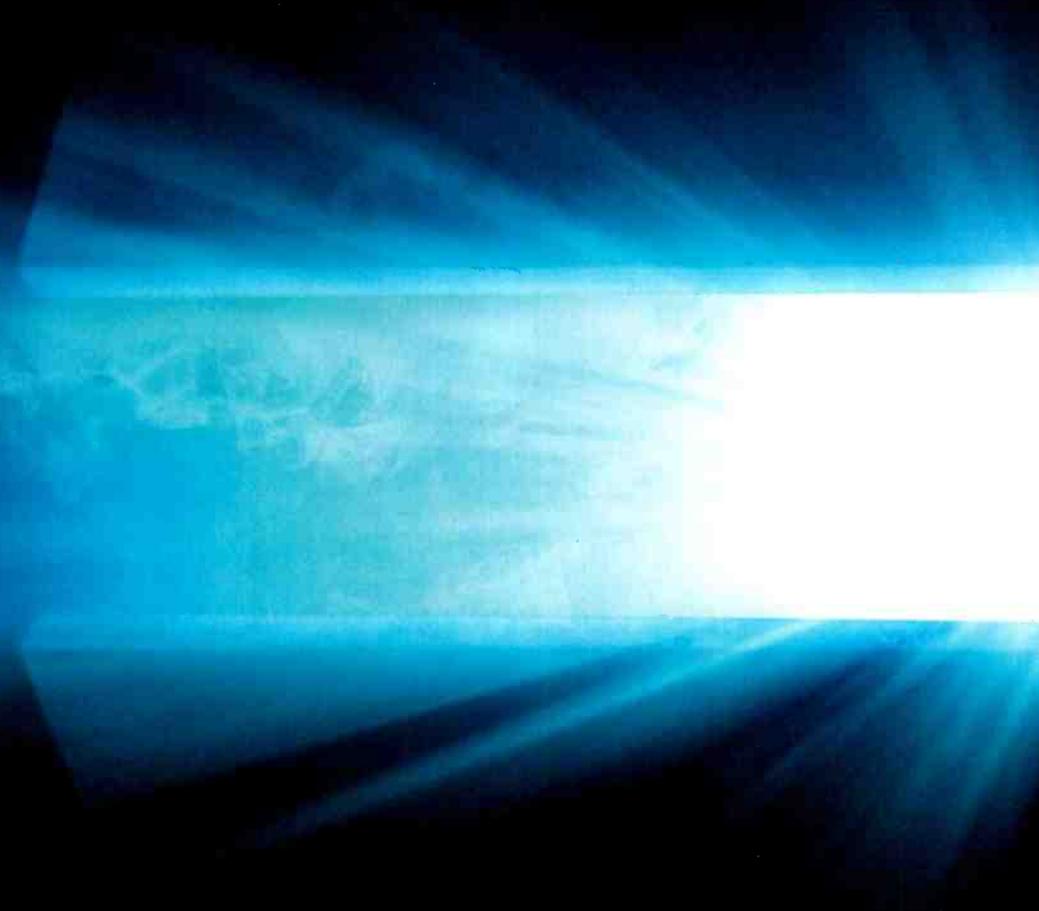


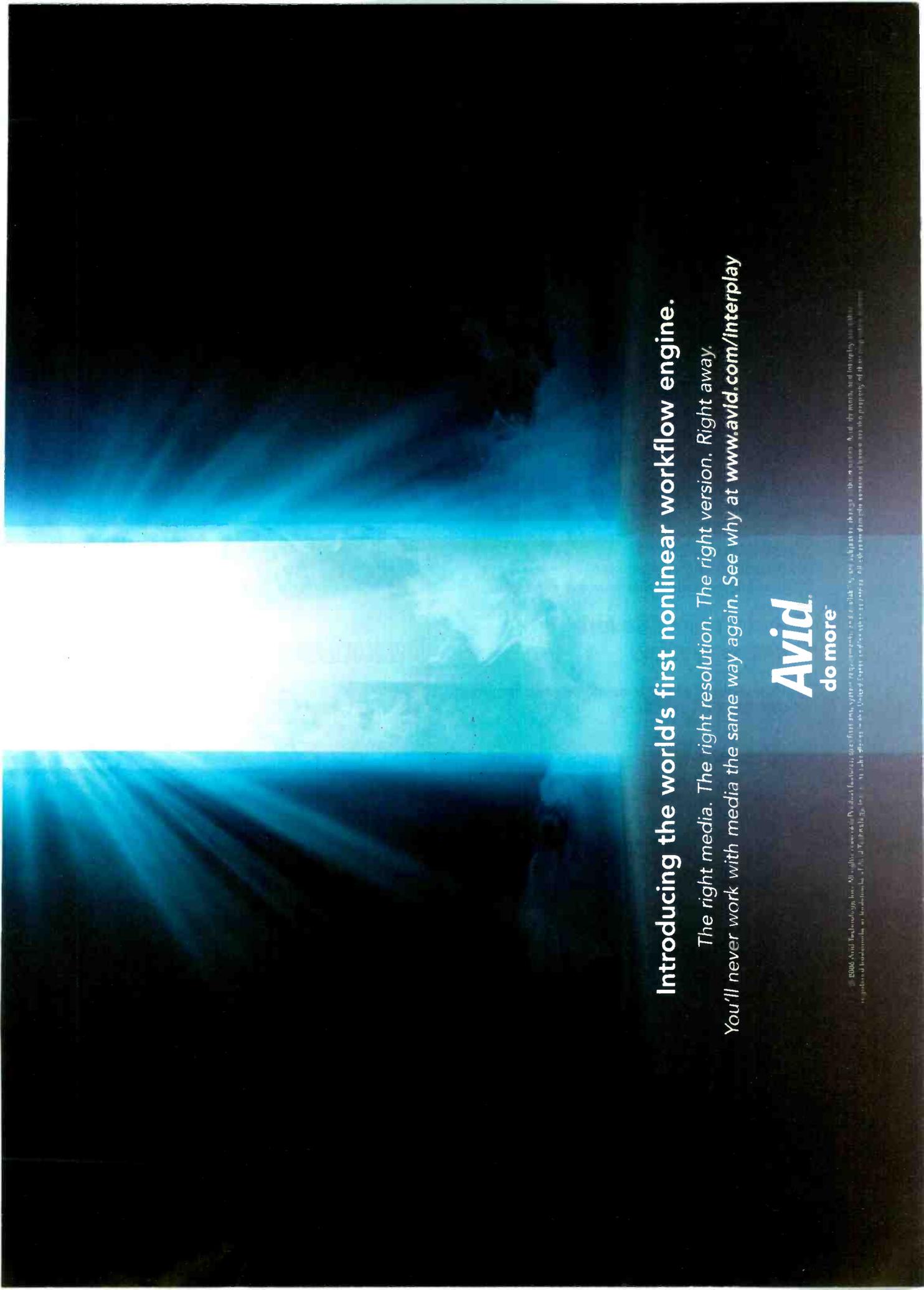
*Connecting content to revenue.
Just what you'd expect from Harris.*

Airtime Sales Scheduling Media Ingest Digital Asset Management Playout Automation Intelligent Transport

At Harris, we're creating the blueprint for digital content management and delivery. And we've given it a name. We call it the H-Class Content Delivery Platform and applications suite. The H-Class Platform makes it possible to easily repurpose, duplicate, convert, and multi-source content within one flexible, shared services platform. By integrating the content-aware H-Class Platform, you'll be empowered to take full advantage of the business models vital for today and into the future. As you add H-Class applications to your operation, more opportunities will emerge to connect content to revenue. Ask a Harris representative how you can connect your content to revenue with the H-Class Platform and applications. Visit www.broadcast.harris.com/h-class

INTE R P L A YTM





Introducing the world's first nonlinear workflow engine.

The right media. The right resolution. The right version. Right away.

You'll never work with media the same way again. See why at www.avid.com/interplay

Avid.
do more

© 2006 Avid Technology, Inc. All rights reserved. Avid, the Avid logo, and the Avid logo are trademarks of Avid Technology, Inc. All other marks are the property of their respective owners.

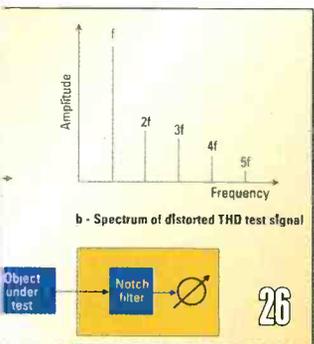
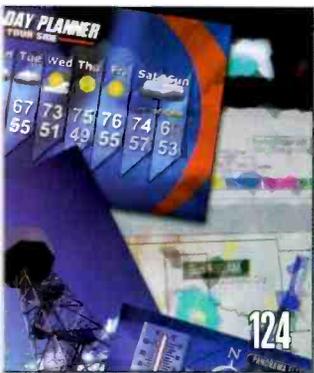
Broadcast Engineering

THE JOURNAL OF DIGITAL TELEVISION

CONTENTS

FEATURES

- 52 NAB Replay**
By Broadcast Engineering staff
Top products and detailed coverage from NAB2006.
- 54 Pick Hits**
By Broadcast Engineering staff
A panel of independent judges bestows awards on the 40 best products from this year's show.
- 58 Technology Seminar**
By Broadcast Engineering staff
The industry's top experts review new technologies seen on the show floor.
- 58 Product Jackpot**
By Broadcast Engineering staff
Almost 200 new products from the exhibit floor.
- 124 Special report: Severe weather systems**
By David Starnes
Provide viewers with the latest and most important severe weather information.



BEYOND THE HEADLINES

- Download**
- 16 Multiple choice media future**
- FCC Update**
- 24 VNRs, a continuing problem**

DIGITAL HANDBOOK

- Transition to Digital**
- 26 Testing audio systems**
- Computers & Networks**
- 34 Network troubleshooting**
- Production Clips**
- 38 Video server technology: Methods for reliable operations**

ON THE COVER:

There were 105,046 registered attendees at NAB2006, which took place at the Las Vegas Convention Center. Photo by Douglas Schwartz.

(continued on page 8)

Ikegami's LCD Monitors:

Multi-Format, Broadcast Quality, Affordable...



For impressive HD
and SD applications.



Ikegami, the world leader in broadcast monitors offers a line of 22, 17, and "travel-anywhere" 9-inch LCD monitors that set the standard for affordable, broadcast quality, space-saving monitors. Whether you are shooting in HD or SD, Ikegami's HLM-2200R, HLM-1700R or HLM-900R (as well as DC portable 900P) is the ideal choice for impressive and convenient LCD imaging.

- HLM-2200**
- Wide screen display
 - HD/SD SDI inputs (qty. 2)
 - NTSC inputs (qty. 2)
 - 600:1 Contrast Ratio
 - 170° Viewing Angle (H/V)
 - 1280 x 768 (WXGA) Resolution

- HLM-900R**
- HD/SD SDI inputs (qty. 2)
 - NTSC inputs (qty. 2)
 - 400:1 Contrast Ratio
 - 170° Viewing Angle (H/V)
 - 1024 x 768 (XGA) Resolution
 - AC and DC (portable)
- HLM-900P**

Ikegami Electronics (USA), Inc. 37 Brock Avenue, Maywood, NJ 07607
 East Coast: (201) 368-9171 West Coast: (310) 297-1900 Southeast: (954) 735-2203
 Southwest: (972) 869-2363 Midwest: (630) 834-9774 www.ikegami.com

Ikegami
 Tapeless • Wireless • Seamless

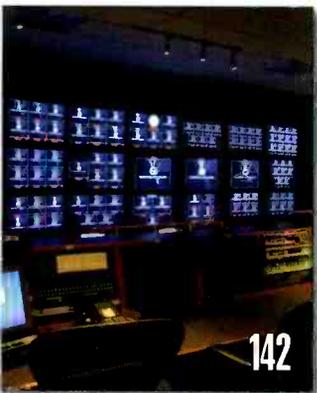
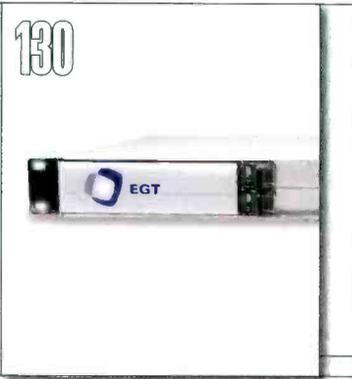
Broadcast Engineering

THE JOURNAL OF DIGITAL TELEVISION

CONTENTS

SYSTEMS DESIGN & INTEGRATION

- Transmission & Distribution
- 46 Turning online services into revenue



NEW PRODUCTS & REVIEWS

- Applied Technologies**
- 130 EGT delivers distributed digital conversion
- 132 Volicon's monitoring and logging solution
- Field Reports**
- 134 Transporting SDI/HD-SDI with MRV Communications' SFP
- 136 KWTW moves to digital archives with Telestream's MAPreview
- 138 Popwire's Compression Master 4.0 Mac OSX-based encoder
- Technology in Transition**
- 142 Monitor walls

DEPARTMENTS

- 10 Editorial
- 12 Reader Feedback
- 144 Classifieds
- 148 Advertisers Index
- 150 EOM

Freezeframe

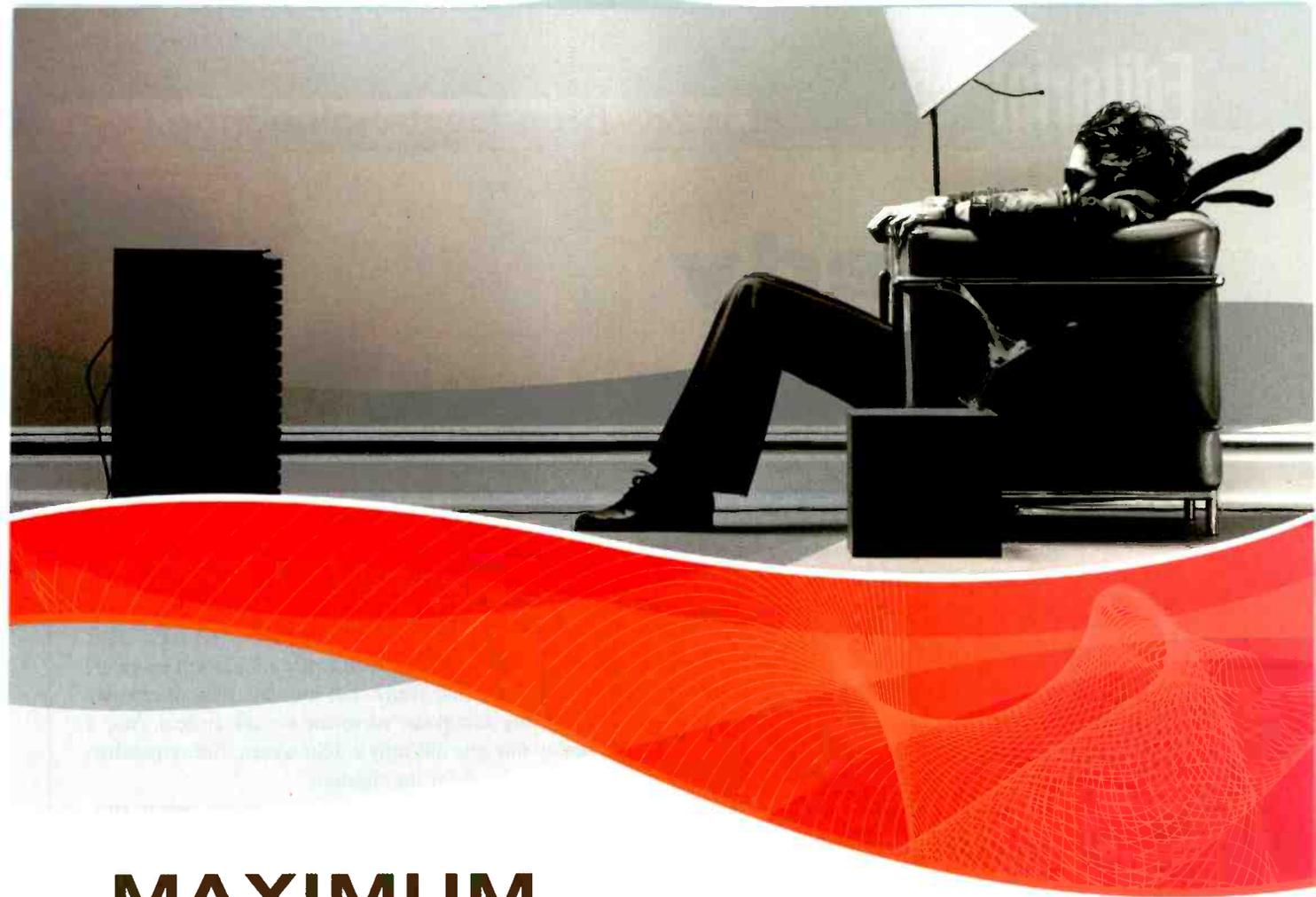
MPEG-4 compression is frequently described as an _____ compression method where an _____ is any part of a picture and can be assessed and processed independently. This question comes from Alexander Louis Todorovic's book *Television Technology demystified: A non-technical guide*. Readers submitting winning entries will be entered into a drawing for *Broadcast Engineering* T-shirts. Enter by e-mail. Title your entry "Freezeframe-June" in the subject field and send it to: editor@prismc2b.com. Correct answers received by August 1, 2006, are eligible to win.

February Freezeframe

- Q. The basic MPEG-2 standard defines ___ profiles and ___ levels. The information needed to decode a single picture is contained in the ___ layer.
- A. The basic MPEG-2 standard defines six profiles and four levels. The information needed to decode a single picture is contained in the picture layer.

Winners:

John Harris, Sharat Kumar, Larry Price



MAXIMUM PERFORMANCE BROADCAST PRODUCTS

For over 30 years, Maxell's innovative technologies have provided broadcast professionals with the highest levels of quality, stability and reliability. That's why we're one of the leading blank media brands for television commercial duplication and playback-to-air, as well as acquisition, editing, post-production and archiving. Moreover, all of our products are backed by Maxell's superior customer service and unsurpassed product warranties. So when you choose Maxell, you've chosen maximum performance products from the maximum performance brand.



Greedy HDTVs

You selfish, evil, big-screen-loving, plasma-pandering, LCD-demanding, DLT-touting, audio-blasting, kilowatt-consuming, power-wasting, TV-watching couch potatoes! Who the heck do you think you are, anyway? Don't you realize your TV habits are killing us? All that electronics is causing power companies to build even more pollution-puking power plants.



Thus goes the theme from the Al Gore crowd, the National Resources Defense Council and their fiends. Oh, sorry, I meant friends.

Yep. It seems the tree-hugging, Birkenstock-wearing, anti-wind-power, global-warming goofballs have decided to take on another cause: our increasing use of electricity for entertainment. Hence, they've just painted a big red target on just about everything in your home, especially your big-screen TV.

Many of us probably put these kinds of people in the kook folder. I don't give much credence to someone who screams the nation's power grid is failing because of our over consumption and in the next breath is protesting against the building of wind turbines off the coast of New Hampshire or Texas, claiming that they are ugly and pollute the visual environment. This is the same group that cries, "You broadcasters with your towers are killing hundreds of thousands

of teeny weeny, little defenseless birds ever year. Shame on you!"

The eco-czars' answer to ever larger TV sets is that they be made more efficient with such federally mandated "features" as sleep modes and require efficiency labels. The groups claim people shopping for new big-screen TV sets will pay attention to how much power the sets use when deciding what set to buy.

Can't you just see the average guy looking at a new HDTV set in Circuit City? He says to his wife, "Hey, hun, let's buy this little one. It's 2.5 percent more efficient than that really cool looking, 65in plasma set with the complete surround-sound system. Yes, I know this one has only a 32in screen. But remember, we're doing it for the children."

Viewers won't buy TV sets based on power consumption. That's like saying people buy cars based on how long they can go between oil changes.

According to Nstar, Massachusetts' largest investor-owned electric and gas utility, a standard 32in television uses about one-third as much power as a 42in plasma TV set. When you add the cost of an STB for the 32-inch, the total yearly cost to power both is \$121.20.

How much does a refrigerator cost to run? A standard fridge costs \$265 per year to operate. If you buy a new Energy Star model, that cost drops to the same as for a plasma TV set. A window air conditioner? \$345 a year.

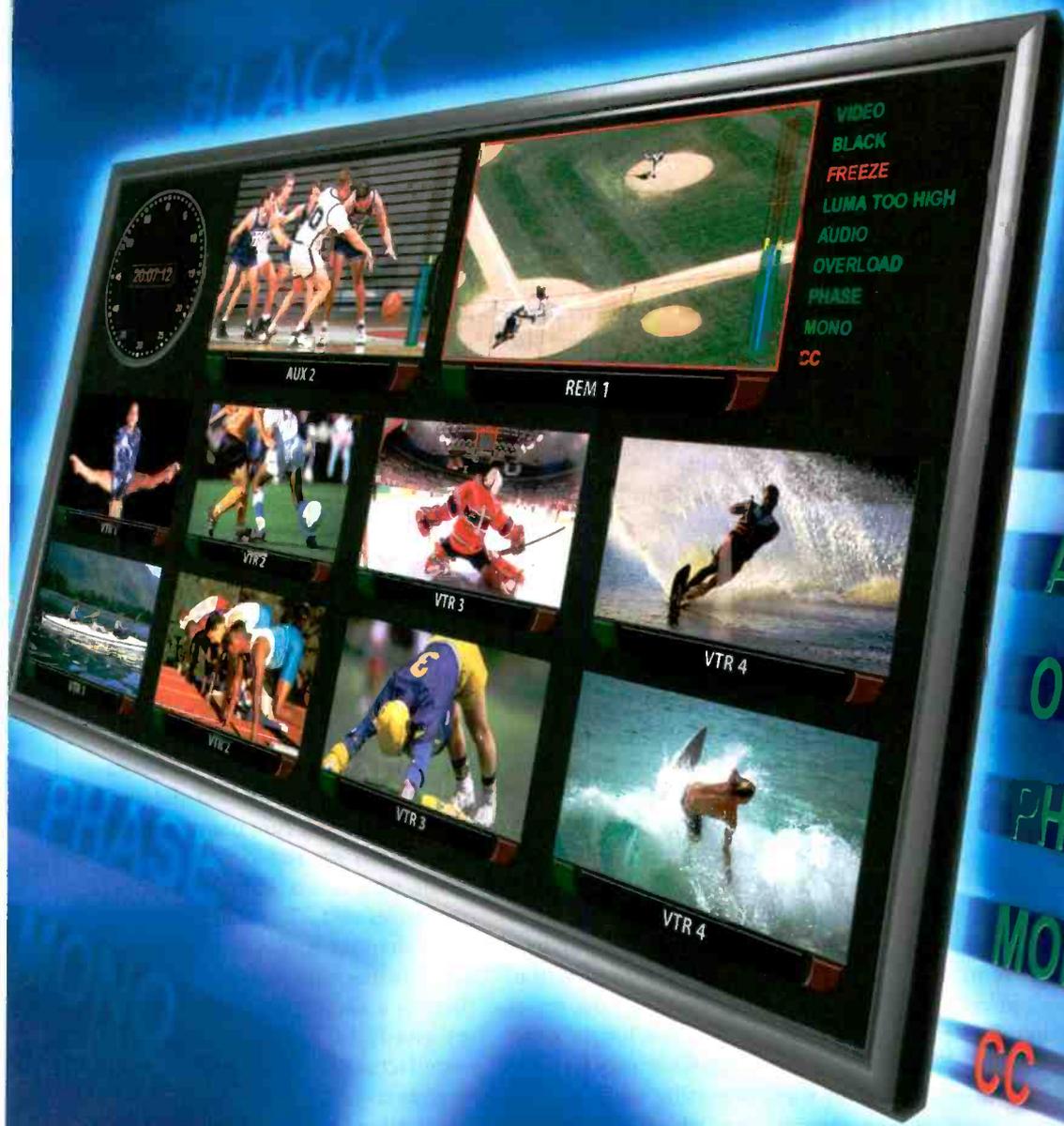
Now, here's the dilemma: Do you choose to sit in an air-conditioned room, watching a great-looking TV set with a cold beer in hand, courtesy of your fridge, or do you choose to sweat it out without the air, a mini-TV and a warm beer. Hmm, let me see.

Okay, I've decided.

I can forgo the air conditioning, but not the rest. Besides, that air conditioner is the most expensive power consumer of the three, so I feel pretty ecologically responsible with this decision. That means it's shorts and T-shirts at my house. Bring on the beer, and what channel is the baseball game on?

Broad Drib
editorial director

Send comments to: • editor@prismb2b.com • www.broadcastengineering.com



VIDEO
 BLACK
 FREEZE
 LUMA TOO HIGH
 AUDIO
 OVERLOAD
 PHASE
 MONO
 CC

Affordable HD display with probing.

Now you can combine high quality HD multi-image display with the signal probing needed for master control.



10-input, auto-sensing HD/SD/Analog processor can also be combined with our Allegro MPEG-4 streaming encoder

The **Kaleido-Alto-HD** provides detection of all the key video and audio parameters, with reporting on-screen or via SNMP for facility monitoring. This

for high quality remote monitoring over IP. So if you're looking for more effective monitoring, call Miranda. We'll help you make it happen.



Tel.: 514.333.1772 | ussales@miranda.com
www.miranda.com

HDTV: MAKING IT HAPPEN



RAID

Brad Gilmer:

Most of the vendors in the video server arena require that we purchase pre-qualified drives from them. Of course, they charge a premium and in some cases an excessive price for a drive. This seems to fly in the face of the IT mantra of using off-the-shelf components and non-proprietary technologies. In your experience, is there a valid reason for manufacturers to do this, or is it a marketing ploy?

WILLIAM T. HAYES
DIRECTOR OF ENGINEERING
AND TECHNOLOGY
IOWA PUBLIC TELEVISION

Brad Gilmer responds:

There are some reasons for manufacturers to charge more than off-the-shelf pricing for their replacement drives. Here are a couple of examples:

- The methodology for calculating the price of replacement components such as drives is somewhat opaque. Such calculations may be based upon long-term purchase commitments. If the RAID array uses 40GB drives and the manufacturer has a policy of purchasing enough drives to keep parts

available for five years, then that manufacturer may be locked into pricing that seems ridiculous two years down the road. The manufacturer may also include other costs that pay for warehousing or customer support.

- Some manufacturers may perform 100-percent quality control on all drives that they put into their arrays. The manufacturers may pass on the cost of this additional quality check in the price of the replacement parts.

- The manufacturer may have to change suppliers at some point, requiring that all of the certification tests run on the original components be rerun on the new drives. Some engineering work may have to be done to make the new drives work in the old system.

- The manufacturer may make modifications to the off-the-shelf drives that involve cost and time.

- The manufacturer may purchase drives that are different from off-the-shelf drives. For example, the drives it purchases may have a longer mean time between failures or may be capable of status reporting, such as RPM or temperature, which the off-the-shelf drives cannot do.

- Manufacturers may also try to dissuade you from putting off-the-shelf drives into their products, even if you are able to find the exact replacement part on the open market. They do this for several reasons, but the biggest reason is that once you start to modify the product, the manufacturer has no idea what sort of system you have. If they just shipped the product and never heard from you again, then this might be fine with them.

However, as users, we expect and demand exceptional customer service for critical systems such as video servers. When users start substituting components and then call the manufacturer expecting support, the manufacturer may end up spending a

great deal of time to solve a problem caused by the substitution. This has a direct cost to the manufacturer. In a perfect world, no user would substitute a 40GB drive and expect it to work perfectly in a RAID array that uses 80GB drives, but it happens. It is not fair for the manufacturer to pay for two or three phone calls until the problem is solved.

- There are occasionally problems on the manufacturer side, too. Some manufacturers know that once you spend \$100,000 on a purpose-built piece of video equipment, you will be reluctant to put anything into the system other than approved parts. They take advantage of this by substantially marking up the off-the-shelf parts. In the long run, manufacturers that do this are shooting themselves in the foot. Users know how much disk drives cost. They can understand some markup to cover engineering, warehousing and testing costs, but there is a limit. Manufacturers who get greedy will be exposed as other manufacturers provide parts at a reasonable cost.

As the trend to use off-the-shelf components continues, prices for complete systems continue to fall. In the long run, the cost of replacement components will also fall.

Everything is a negotiation. If a drive price seems excessive, ask the manufacturer to negotiate a reduced price on spare parts. You might also try to negotiate a clause that lets you put in off-the-shelf drives. Ultimately, you may have to go to a manufacturer who has a pricing policy you can live with.

BE

Test Your Knowledge!

See the FreezeFrame question of the month on page 8 and enter to win a Broadcast Engineering T-shirt.

Send answers to editor@prism2b.com

Reality TV

Broadcast

West End, London

Broadway, NY

Live Concerts

Shows Theaters

Sports Events

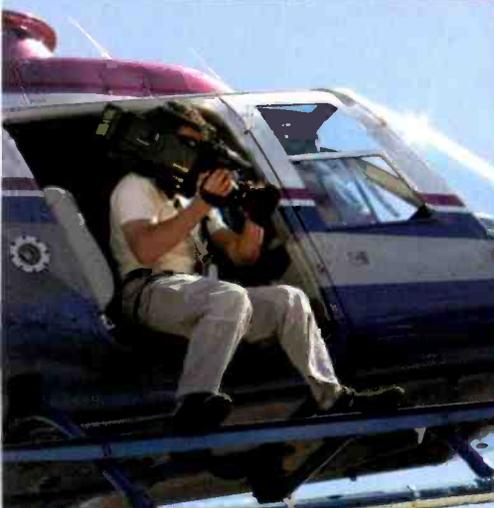
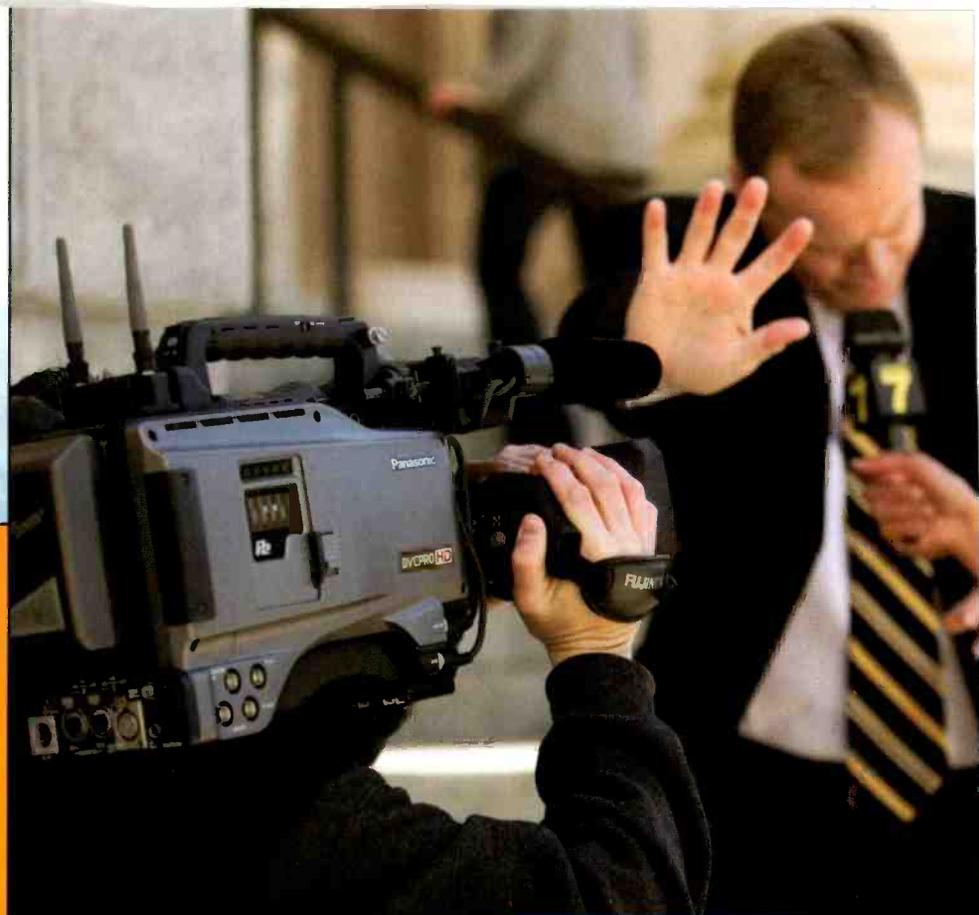
**Reliably covered by
Sennheiser RF wireless**

You can always rely on Sennheiser RF wireless systems, wherever you are in the world, whatever the task you face. As one of our customers puts it, "Sennheiser RF works where others fail". Try the surprisingly small and rugged new SK 5212 bodypack and the awarded microphone SKM 5200 on any stage or broadcast situation. Choose from the world's most comprehensive RF wireless portfolio for proven quality and innovative products – with microphone and accessories of every sort of custom-made specials and global support service. Sennheiser equipment is upwards and downwards compatible so it always remains a reliable investment.

www.sennheiser.com



Go to extremes - Ever captured the Iditarod in the frozen Alaskan tundra? P2 has. When rain, wind and humidity played havoc with tape-based cameras during the Gulf Coast hurricanes, P2 performed flawlessly. P2 products offer you the greatest reliability, whatever the weather conditions.



Shake things up - When breaking news hits, don't let it knock you for a loop. P2 withstands shock up to 1,500 G and vibration up to 15 G - ensuring you'll get the shot no matter how bumpy the ride.



Speed editing -
The portable AJ-HPM100 records/plays DVCPRO HD, DVCPRO50, DVCPRO and Mini-DV. For nonlinear editing with a laptop, P2 cards plug directly into the PCMCIA card slot; no digitizing. With data transfer at up to 640 Mbps, you'll be producing at the speed of IT.



when reliability counts.

DVCPRO HD P2 is the only high definition recording technology with no moving parts to wear out. Impervious to shock and vibration, it offers the highest reliability, especially in challenging newsgathering situations. Upgradable capacity, random access to footage, laptop field editing and ultra-fast transfer combine to make P2 solid-state memory recording the unmatched choice for news production today and tomorrow.

For more information visit www.panasonic.com/broadcast or call 1.800.528.8601

DVCPRO HD P2

Panasonic ideas for life

AJ-HPC2000

DVCPRO HD P2 Camcorder

Outfitted with three full 2/3" HD CCDs and 14-bit A/D processing, this news camera offers exceptional dynamic range and low light recording in the 720p or 1080i HD and 480i SD formats. Uses widely available pro-quality lenses and accessories.



AJ-HPS1500

P2 DVCPRO Studio Recorder

It's a highly versatile, solid-state recorder/player for the broadcast or production facility, with G-bit Ethernet, USB 2.0, IEEE 1394 (AVC), HD-SDI and SD-SDI input/outputs. The recorder offers five P2 slots and two industry-standard slots for removable hard disk drives.

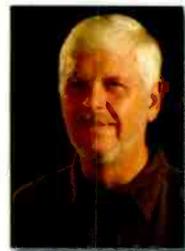


AJ-HPM100

Mobile DVCPRO HD P2 Recorder

Fully equipped with a six-slot P2 drive, a 9" widescreen LCD monitor with built-in stereo speakers, a jog/shuttle dial and function buttons, and an SD card slot, it operates on either AC or DC power.





A multiple choice media future

BY CRAIG BIRKMAIER

For decades, free-to-air broadcasting dominated the landscape of television. The NAB was considered to be the most powerful lobby in the nation's capitol. Today, the NAB's annual conference and exhibition continues to grow, even as the broadcasters it represents have fallen into a long, slow decline.

At NAB, broadcasting is now a side-show. It's the world's largest digital media marketplace that feeds the NAB's coffers in much the same way that TV broadcasters now look to millions of cable subscribers to pay a monthly subscription fee for free TV.

The TV world has exploded with multiple choices. For decades, this largely meant more program choices than the limited number of analog channels offered by TV broadcasters to deliver one program at a time.

Broadcasters who went to NAB2006 may have come home understanding a new meaning for multiple choice: Consumers want more choice, not

just in terms of content, but also in the venues for which digital media content can be optimized and delivered to them — anywhere, anytime on virtually any device.

Broadcasters are learning that they made a poor choice with respect to their standard for DTV broadcasting — that they are being left behind as the content conglomerates begin to exploit new channels of distribution in pursuit of new revenue streams. The short-lived era of free TV is over, at least here in the United States.

No respect

I still remember a conversation that took place in the early '90s with a close friend who has enjoyed a successful career as a broadcast engineer. At the time, I was participating in the Advisory Committee on Advanced Television Services (ACATS), which ultimately recommended to the FCC the adoption of the ATSC digital television standard. That standard was

being optimized for only one thing: the delivery of a single, high-definition television program via a 6MHz RF channel.

I was advocating a less rigid approach to DTV broadcasting, one that would allow the ability to broadcast all kinds of bits to all kinds of devices. This could include HDTV programs delivered alongside multiple channels of SDTV and new services capable of delivering TV and other forms of content to mobile and portable devices. My friend proceeded to lecture me about the basics of the broadcast TV business model.

"We are in the business of delivering the largest number of eyeballs possible at any moment in time to our advertisers," he said. And he was quite adamant that multicasting would further fragment the broadcast TV audience, while driving up programming and operating costs. It seems that most broadcasters still believe in the viability of this legacy business model; unless, of course, the FCC would grant them multicast must-carry/retransmission consent.

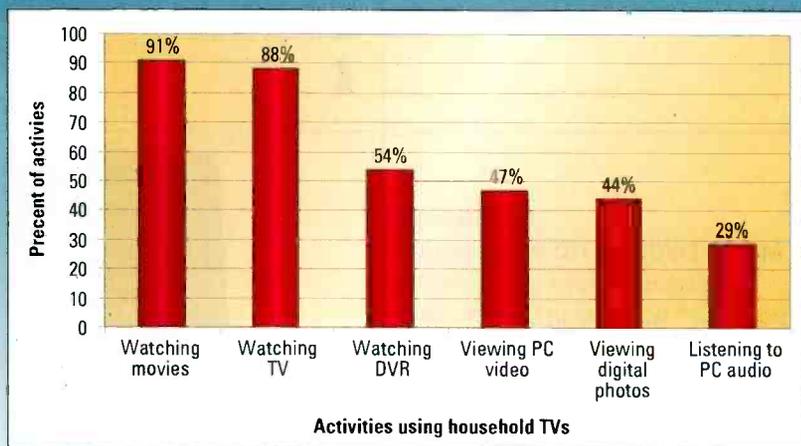
The topic of multicasting continues to rear its head from time to time. Somehow, it managed to slip in the backdoor of the ATSC standard at the last moment. Back in 1997, it nearly caused some heads to roll when ABC floated the idea that the network would fill the new DTV service with multicasts rather than a single HDTV program.

At the time, Sinclair Broadcasting president David Smith was a big fan of multicasting. In a 1997 interview, he talked about his controversial decision to reject HDTV and use his new digital channels for multicasting. Smith told *The Baltimore Sun* that the costs inherent in converting to HDTV

FRAME GRAB A look at the issues driving today's technology

Desired activities using household TVs

Fifty-four percent of consumers use TVs to watch DVRs



Source: CEA

www.ce.org

From the umpire's call to the roar of the crowd,
nothing delivers surround sound like Dolby® E.



Today's HDTV viewers expect surround sound with their programming, and Dolby® E makes it happen. With Dolby E you can easily deliver surround sound from the remote truck to the network, from the network to the local station, and within cable and satellite operations. Dolby E converts your two-channel broadcast plant to a multichannel audio facility.

Dolby E carries audio metadata to ensure the integrity of your program's original sound. It automatically controls the complete audio delivery path—from production to the viewer's home. And with all the other broadcast products now incorporating Dolby E, you can deliver surround sound more easily than ever. Join the hundreds of broadcast and postproduction facilities that already know how well Dolby E delivers. It's the right call to make.

www.dolby.com/tvaudio

Dolby and the double-D symbol are registered trademarks of Dolby Laboratories.
© 2005 Dolby Laboratories, Inc. All rights reserved. 505/16322



would have been staggering, and, besides, "I'm not going to get any more money from the car dealer on the corner because I have a prettier picture." (See "Web links" on page 20.)

By 2004, after the company tried unsuccessfully to get the FCC to allow alternatives to the ATSC standard, Sinclair was singing a different tune. When *USA Today* published a story in which it noted that 213 stations were delivering multicasts via their DTV signals, Sinclair's Smith was skeptical, "I'm not holding my breath that anyone's going to get rich putting weather up."

Recently, Sinclair announced two new multicast initiatives. WBFF-TV, the broadcaster's Baltimore Fox affiliate, has launched a multicast channel carrying syndicated and local programming. WBFF-DT-45.2 can be accessed over-the-air and on

the Comcast and Millennium digital cable systems (and on Verizon's FiOS-TV service when it's launched in Baltimore). The new digital channel broadcasts 24/7.

In March, The Tube Music Network announced a distribution agreement with Sinclair. Revealed just two weeks after a similar agreement with Tribune

can work is if cable systems are forced to carry these extra channels. This notwithstanding the fact that Sinclair and other broadcast groups have managed to gain carriage of both primary HD channels and additional multicast channels via voluntary negotiations.

The last time the subject of multicast must-carry came up at the FCC,

"I'm not going to get any more money from the car dealer on the corner because I have a prettier picture." — David Smith

Broadcasting was announced, The Tube Music Network is also available on 13 stations in Raycom Media markets.

Multicasting in the United States does not get much respect. Broadcasters firmly believe that the only way it

it was rejected, with a dissenting opinion from Commissioner Kevin Martin. At NAB2006, Martin, who is now FCC Chairman, suggested that this was "a missed opportunity for the commission." Martin noted that a wider choice of channels could



Scientific Atlanta has helped deliver FIFA World Cup matches and Summer and Winter Olympic Games coverage to sports fans around the globe for over 20 years.

Innovation Never Stops

Competition for viewers is greater than ever. MPEG-4 AVC encoding from Scientific Atlanta delivers a winning performance.

- Superior video coding/quality — 50 percent improvement over MPEG-2.
- Bandwidth efficiency — More channels over existing bandwidth.
- Reliability — Maximum service availability.
- Bandwidth use — CBR and VBR encoding.

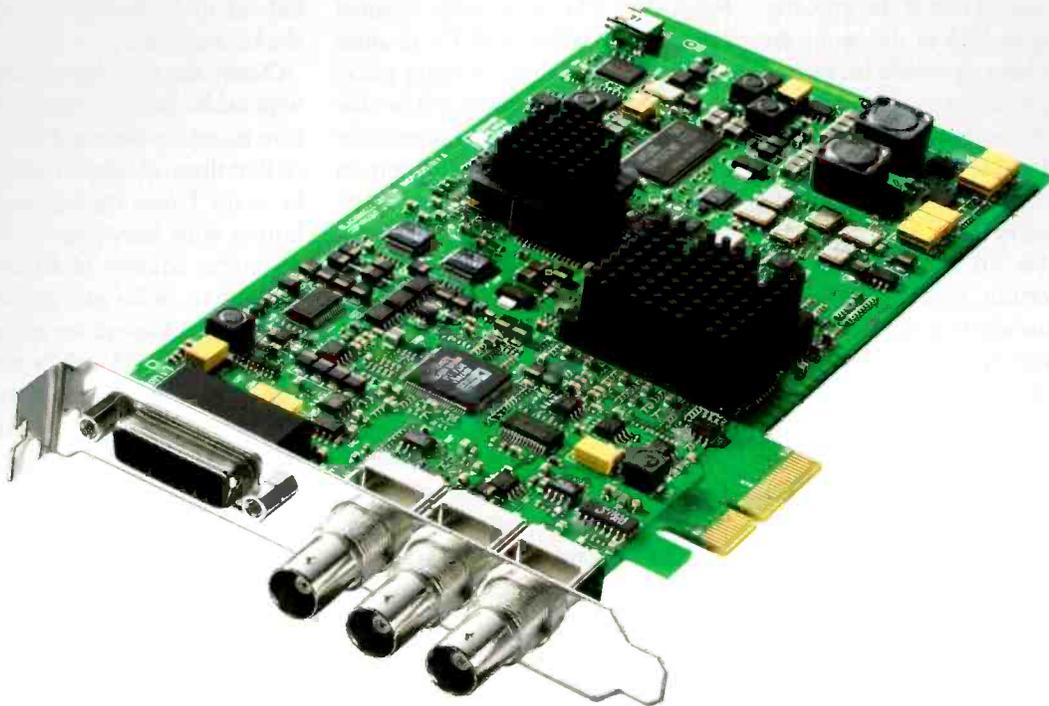


HDTV MPEG-4 AVC Encoder — Model D9054-

www.scientificatlanta.com/compete

**Scientific
Atlanta**
A CISCO COMPANY

Blackmagicdesign



Only DeckLink HD Extreme has SDI and analog connections in HD and SD for only \$995!



The new DeckLink HD Extreme features both SDI and analog I/O connections that instantly switch between HD and SD. Use with the latest PCI Express Mac and Windows computers for the world's highest quality editing, effects and broadcast paint solution.

Connect to any Deck, Camera or Monitor

DeckLink HD Extreme supports standard and high definition SDI 4:2:2 and analog YUV, as well as NTSC/PAL and S-Video in and out. DeckLink HD Extreme also features 2 channel AES audio and professional analog stereo XLR audio in and out. An RS-422 port is included for controlling broadcast decks and a genlock/HD tri-sync input for connecting to large broadcast systems.

SD

HD

High Definition and Standard Definition

If you're moving between SD and HD, DeckLink HD Extreme's SDI and analog component YUV connections will switch standards instantly. Work with the widest range of equipment, such as Betacam SP, HD set top boxes, HDV cameras, Digital Betacam, HDCAM, D5, HDCAM SR 4:2:2 and more.



World's Highest Quality

DeckLink HD Extreme works natively in 10 bit 4:2:2 and features the industry's only true 14 bit analog conversion with uncompressed video capture/playback. With uncompressed 10 bit capture and playback, you'll always retain that pristine film look.

Compatible with Popular Video Software

DeckLink HD Extreme gives you the freedom to move between platforms with drivers for PCI Express Apple Mac OS X™ and Microsoft Windows™ systems. Use your favorite video software such as Final Cut Pro™, Premiere Pro™, After Effects™, Photoshop™, Shake™, Combustion™ and many more.



DeckLink HD Extreme
US\$995

Learn more today at www.blackmagic-design.com

provide the incentive for many of the homes that now depend exclusively on the NTSC service to buy DTV receivers. He stated that if the majority were willing to look at the multicast must-carry issue, it would be an important opportunity to address the issue before the return of analog channels, now slated for 2009.

Congress did not address the multicast must-carry issue when it set the new deadline for the return of the analog spectrum. And it is not likely that this issue will be addressed in any telecommunications legislation during this session of Congress.

The most visible attempt to use the DTV spectrum for multicast services is by USDTV, which now operates a multichannel subscription TV service in four U.S. markets: Albuquerque, NM; Dallas-Ft. Worth; Las Vegas; and Salt Lake City. In these markets, broadcasters share spectrum with USDTV, which delivers a package of 12 TV channels in addition to the primary program channels of all local DTV broadcasters.

At NAB, USDTV announced that it is migrating its portion of the ser-

vice to the more efficient H.264/AVC compression technology, which is also being used by DIRECTV and Dish Networks. The increased channel capacity will allow USDTV to offer additional paid programming packages. Existing subscribers will be able to get an AVC-to-MPEG-2 transcoder module that plugs into a USB port on current set-top boxes. The company also announced that a new AVC-enabled set-top box with a DVR would be available by the end of the year.

Over there!

U.S. broadcasters (and USDTV) are still struggling to find a viable business model for digital broadcasting. They need look no farther than the UK for a real world case study.

As was the case with most European countries, the UK rejected the notion of moving immediately to HDTV, choosing instead to offer a wider choice of SD multicast channels. The original business model included free-to-air equivalents of existing analog channels and a subscription service called On Digital. With the subscription service, a home could receive about 30 channels for a monthly fee below that of cable and DBS.

On Digital languished and ultimately failed due to financial problems related to bidding too much for exclusive television rights to a football (read: soccer) league. The system was reborn as Freeview, which offers about the same number of channels with no subscription fee. Viewers need only purchase a digital set-top box to receive the multicast package.

The response has been excellent, with more than 10 million receivers in 6.4 million homes. Freeview is expected to pass DBS service BSkyB in total subscribers this year. Even more important, UK broadcasters have recently bid millions of dollars to gain channel slots on the free service. (See "Web links.")

U.S. broadcasters may be wondering how this is possible. How can a company make money delivering advertiser-supported television content

without the help of the cable and DBS subscriber fees (which now account for nearly half of the typical monthly bill for multichannel TV services in the United States)?

Clearly, the only way to make money with multicasting in the United States is to mandate cable and DBS carriage so that these additional programs can be seen. There are just not enough homes with free-to-air DTV receivers in this country to attract enough eyeballs to make any money. It's as if U.S. broadcasters are saying, "Why worry about DTV when we can get the multichannel services to collect a fee from every viewer for using 'their' networks? Who cares about reaching TVs with antennas anyway?"

Anycasting

Apparently, there is a growing group that believes that we want to watch TV on cell phones, video iPods, BlackBerries, notebook computers and those screens that keep popping up in cars. You can count the NAB among those organizations that think TV broadcasters should be able to serve the growing market for mobile and portable video.

It is not surprising that the media conglomerates are less than keen on this idea. The content oligopoly is desperately trying to monetize the delivery of video through multiple distribution channels. The wireless phone companies and Qualcomm's (COFDM-based) MediaFlo network charge subscribers for the video content they deliver. And the media moguls are learning how to use the Internet to download content — for a fee.

For now, unfortunately, U.S. broadcasters are watching from the sidelines as a world of digital media, with new opportunities, takes form without them.

BE

Craig Birkmaier is a technology consultant at Pcube Labs, and he hosts and moderates the OpenDTV forum.

Web links

1997 Sinclair statement on multicasting

www.showbizdata.com/contacts/picknews.cfm/13413/SINCLAIR_CHIEF_CLEAR_WON'T_SELL

2004 USA Today story on multicasting

www.usatoday.com/money/media/2004-01-28-multicast_x.htm

The Tube Music Network

www.thetubetv.com

2006 FCC Chairman Martin's statement on revisiting must-carry ruling

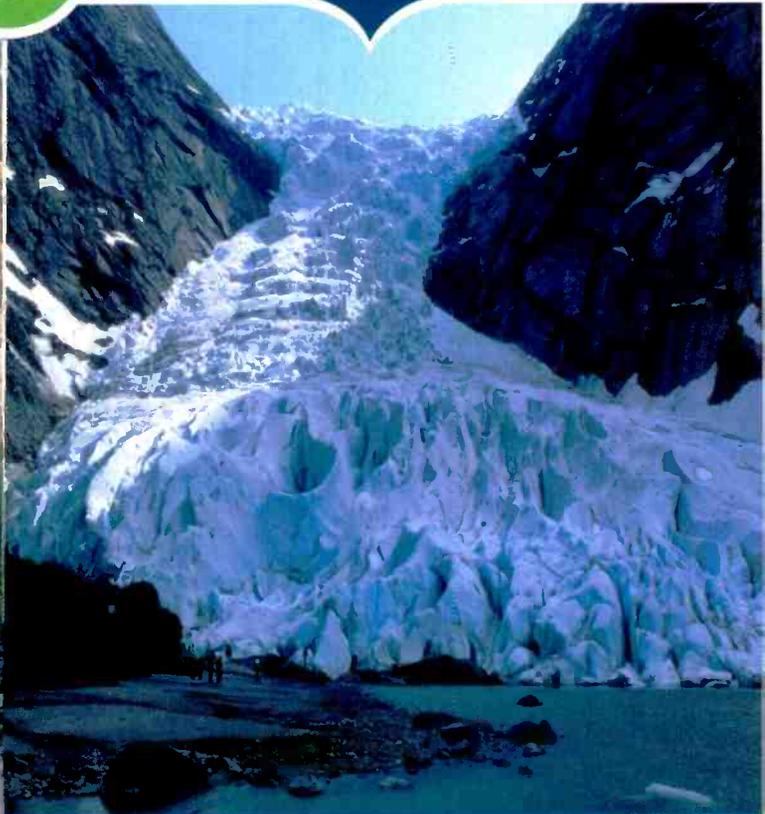
www.njtelecomupdate.com/lenya/telco/live/tb-WHAL1145995902432.html

ITV wins Freeview channel auction

http://news.bbc.co.uk/1/hi/entertainment/tv_and_radio/4402071.stm



ENCODING CAN MEAN THE DIFFERENCE BETWEEN WORKFLOW & WORK SLOW



SPEED MATTERS

You don't have an eon to carve your niche.
If you can't get high-quality video content to market quickly, you'll be left behind.

Does it take you hours – or days – to encode a few minutes of video? Inlet's Fathom™ encoder leverages the power of hardware to deliver real-time encoding – in both SD and HD. Worried about quality? Don't. Our Semaphore™ Quality Control software helps you analyze every frame, and alerts you to any detail that doesn't meet your standards. So you produce the quality content your audience expects, in a fraction of the time. With Inlet's workflow efficiencies you can deliver more content more quickly, for commercial opportunities like VOD, IPTV and mobile video – and you can do it now.

Make your deadlines, wow your clients, win more projects.
You have the talent, we have the tools.

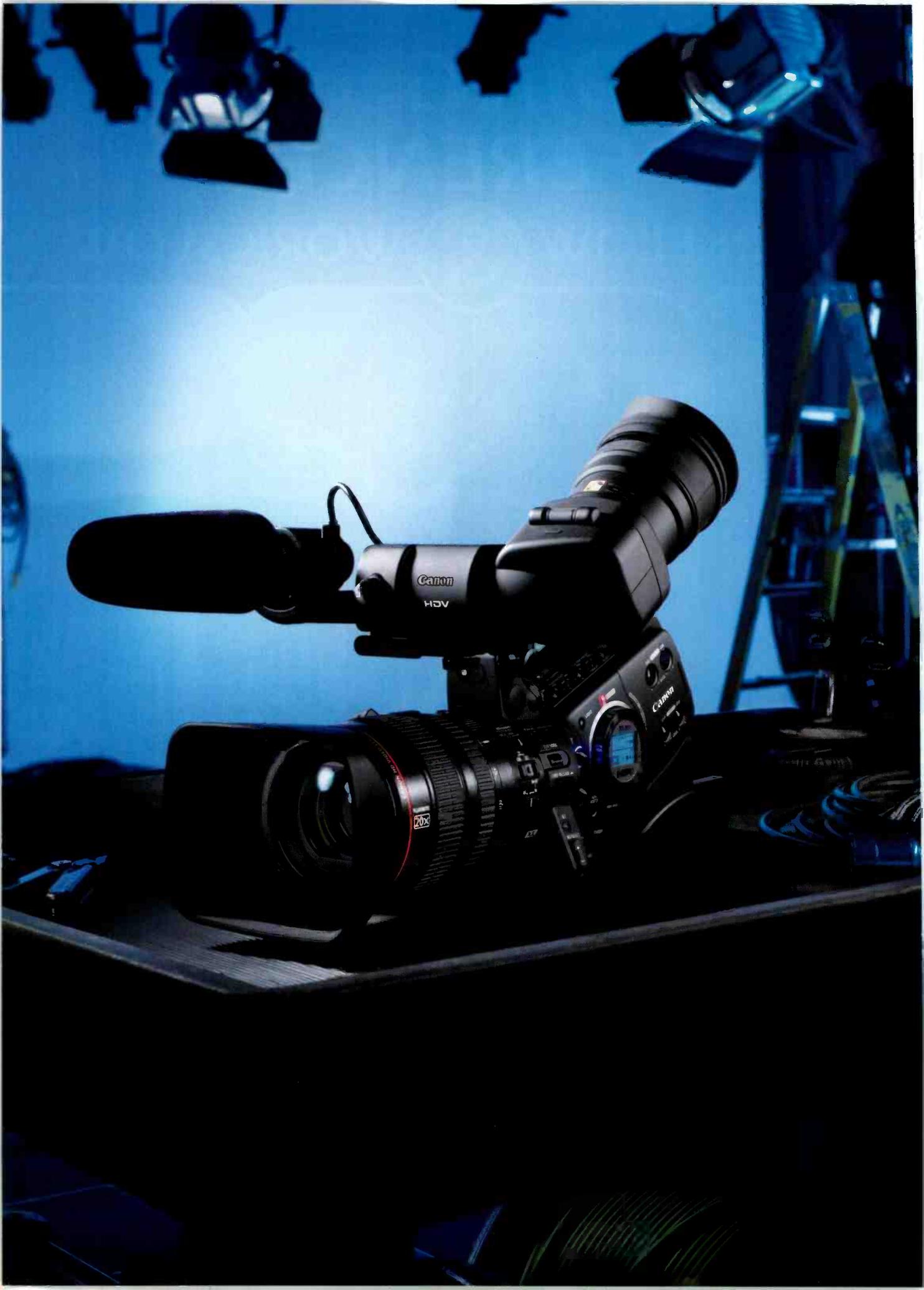


Fathom Pro for SD
Only \$9,999.00

INLET
HIGH-DEFINITION

The Channel to Digital Media

Learn more.
Call: 919-256-8145
www.inlethd.com



3CCD: 1440 x 1080 EACH.
HD-SDI OUT: SMPTE 292M.
SMPTE TIME CODE IN/OUT.
20x HD VIDEO LENS.
AND BUILT-IN GENLOCK.
FOR UNDER \$9,000?*

THE CANON XL H1 HD CAMCORDER.

Whether you're a broadcast ENG producer, documentary, feature or commercial videographer, your HD camcorder has arrived. Here are just a few of its unparalleled litany of features. The Canon XL H1 is built around a 3CCD system with separate native 16:9 CCD's. Each 1/3" CCD has 1440 x 1080 pixels, resulting in high resolution, accurate color reproduction and a wide dynamic range with virtually no color noise. For pristine image quality, the XL H1 features uncompressed digital HD-SDI output (SMPTE 292M). And multi-camera shoots are no problem, thanks to SMPTE time code input and output and

XL H1 Genlock synchronization. The features and innovations continue as you also get Total Image Control which includes 3 color matrixes, 2 cine gammas, and adjustable: knee, black stretch, setup level, master pedestal, horizontal detail, coring, sharpness, 2 noise reductions, color gain, hue, and master color setup adjustments. Since each adjustment is individual, you can create your own custom look and store it on an SD memory card. The XL H1 delivers 1080i HD resolution, along with three different frame rates of 60i, 30 Frame and 24 Frame – so no matter what your production, the XL H1 has you covered. There's also the optional 60i / 50i Video Mode Option, which means that you can record in both NTSC and PAL. You can even take photos with the XL H1 either in video or camera color space. And in keeping with Canon's Open Architecture approach, optional CONSOLE Image Control & Storage software delivers unprecedented flexibility and versatility. Proving, of course, that the XL H1 is truly high definition's highest expression. You'll find so much more about this amazing, affordable HD camcorder at www.canondv.com.



VNRs, a continuing problem

BY HARRY C. MARTIN

Video news releases (VNRs), unsolicited taped publicity pieces, continue to create issues for TV stations that do not identify the sources when all or part of such pieces appear in their newscasts.

About a year ago, the FCC publicly warned licensees that they might have to disclose the origins of any tape used in a newscast if it was originally provided as part of a VNR. The warning arose after government-produced VNRs — including fully-produced packages that look like news stories — appeared on-air at some stations.

The commission also asked for public comment on VNR use, with the

Dateline

July 10 is the date that TV and Class A stations should place their quarterly issues and programs lists, and their quarterly children's programming reports (Form 398), in their public files. Form 398 also must be filed electronically with the FCC by July 10.

August 1 is the deadline for TV, LPTV, Class A TV and TV translator stations in California to file their 2006 renewal applications. TV and Class A stations must also file EEO program reports (Form 396) along with their renewals.

August 1 is the deadline for TV stations in California, North Carolina and South Carolina to file their biennial ownership reports.

August 1 is the date on which TV and Class A stations in the following states must place their annual EEO reports in their public files and, if they have one, post them on their Web sites: California, Illinois, North Carolina, South Carolina and Wisconsin. Stations with fewer than five full-time employees are exempt.

apparent intention of banning their use except where the sponsoring organization or government agency is properly identified.

According to a recently released study prepared by the Center for Media and Democracy and Free Press, as many as 77 TV stations used VNR-provided tape in the last year without disclosing its origins. The study was released with considerable fanfare, accompanied by a statement from Commissioner Jonathan Adelstein, a long-time critic of VNRs. Adelstein and his colleague, Michael Copps, have demanded that these stations apologize to their viewers.

Last spring, the FCC suggested that it could enforce good journalism practices through commission rules requiring disclosure of sponsorship and similar financial interests. The theory is that somebody somewhere presumably paid good money to have the VNR produced, with the goal being to persuade somebody of something through a broadcast of the piece. The sponsorship identification rules require that when a station receives consideration for the broadcast of any material, or when a station has actual knowledge that consideration was paid somewhere along the line, the station is obligated to disclose that information to its audience. Section 73.1212(a)(2) of the rules states that where a piece is provided free of charge, or at a nominal charge, no sponsorship ID is required.

Certainly, licensees have an interest in doing the right thing and disclosing to their audiences who is sponsoring various materials in their newscasts. But now, another more practical reason for policing compliance with the sponsorship ID rules is looming. The attorney general of New York,

Eliot Spitzer, has been on a crusade against payola practices on the part of major record companies and radio licensees. He has entered into multimillion-dollar settlements with at least two record giants and has filed a lawsuit against a major group radio station owner. All the while, Spitzer has complained that the FCC has not enforced the payola (i.e., sponsorship ID) rules.

In April, the commission sent letters of inquiry to four broadcast groups seeking information concerning their relationships with record companies and record promoters. Published reports suggest that the four radio groups were negotiating with the FCC to try to reach a consent agreement under which they would make a "voluntary" contribution to the U.S. Treasury and possibly agree to adopt certain procedures and policies aimed at preventing sponsorship ID violations. But reports indicate that no agreement has been reached because the FCC is looking for a contribution of many millions of dollars, not the \$1 million the broadcasters offered.

With sponsorship ID investigations open on at least two fronts, the VNR issue is not going away. As a result, broadcasters would be well-advised to take a close look at their own internal policies relating to this issue. The sources of VNRs should, in all cases, be identified on the air. If the FCC decides to enforce this, fines could amount to tens of thousands of dollars or more due to the recent attention being given to sponsorship identification issues. **BE**

Harry C. Martin is the immediate-past president of the Federal Communications Bar Association and a member of Fletcher, Heald and Hildreth PLC.

SEND Send questions and comments to: harry_martin@prism2b.com

Talk about intelligent design...



- MPEG-2 CODECS
- DV CODECS
- EMBEDDED AUDIO
- AES/EBU AUDIO
- +4 ANALOG AUDIO
- 170 HOUR CAPACITY
- 4-DRIVE RAID ARRAY
- CLOSED CAPTIONING
- TARGA GRAPHICS
- INPUT FRAME SYNC
- HEAD & TAIL TRIMMING
- AS-RUN LOGS

360 Systems is delivering a new class of Image Servers.

Take a close look and you'll find new features that enhance workflow speed and content quality. New Remote Workstation software lets you create work areas for ingest, trimming, playlisting or review—and place them anywhere you need them. New network transfer tools move content fast, to and from popular NLEs. And now, Image Servers import and export more forms of video and audio than ever before.

Whether you're running a network, mid-market station or cable access channel, the new Image Servers with Advanced Playlisting, accurate As-Run logs, and easy editing functions may be everything you'll need to get to air.

Today's intelligently-designed Image Servers deliver a new generation of capabilities, yet are incredibly affordable—which may explain why they've become today's best-selling broadcast servers.

360 Systems[®]
BROADCAST

Testing audio systems

BY MICHAEL ROBIN



The performance of an audio system element (e.g., an audio mixing console) or a complete system (consisting of a number of individual system elements connected in a typical operational configuration) is expressed in terms of measured values of performance-indicative parameters. Audio performance-indicative parameters are grouped in three major categories: linear distortions, nonlinear distortions and noise. This article deals with performance test concepts as developed by North American broadcasting organizations. A future article will discuss the dynamic range, with reference to analog and digital systems, as well as implications of various concepts of audio signal level monitoring (PPM and VU-meter).

Linear distortions

Electrical signal waveform modifications independent of the signal amplitudes are linear distortions. It

is assumed that the amplitude of the electrical signal does not exceed the clipping level of the equipment under test. There are two major types of linear distortions encountered in practice: non-uniform frequency response and non-uniform phase response.

Amplitude vs. frequency response is the peak-to-peak variation over a specified frequency range of the measured amplitude of an audio signal, expressed in dB with reference to the signal level at a specified frequency (usually 1kHz). The input port of the object under test is fed a 1kHz signal at the standard operating level (SOL) (i.e., +8dBu or +4dBu for high-level inputs and, typically, -60dBu or -70dBu for microphone inputs).

The gains are adjusted to obtain SOL (+8dBu or +4dBu) at the output. The audio analyzer is calibrated to read 0dB at the reference frequency. The input signal frequency is varied in discrete steps, or continuously, and readings in dB, with reference to 0dB,

are taken at specific frequencies. The measured frequency range is usually 20Hz to 20kHz. Figure 1 shows the typical setup for frequency response measurements.

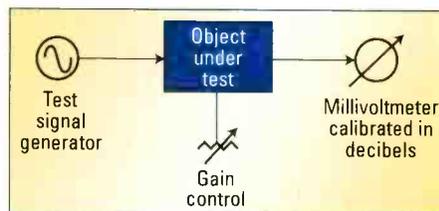


Figure 1. The measurement of frequency response

Phase vs. frequency response is the variable phase shift occurring in a system at several frequencies within a given band. The input of the object under test is fed a signal of variable frequency. A calibrated phase meter is connected at the output of the object under test. A plot of phase vs. frequency is carried out over the frequency band of interest.

Nonlinear distortions

Nonlinear distortions of an electrical signal are caused by deviations from a linear relationship between the input and the output of a given equipment or system. There are two types of nonlinear distortions encountered in practice: harmonic distortion and intermodulation distortion.

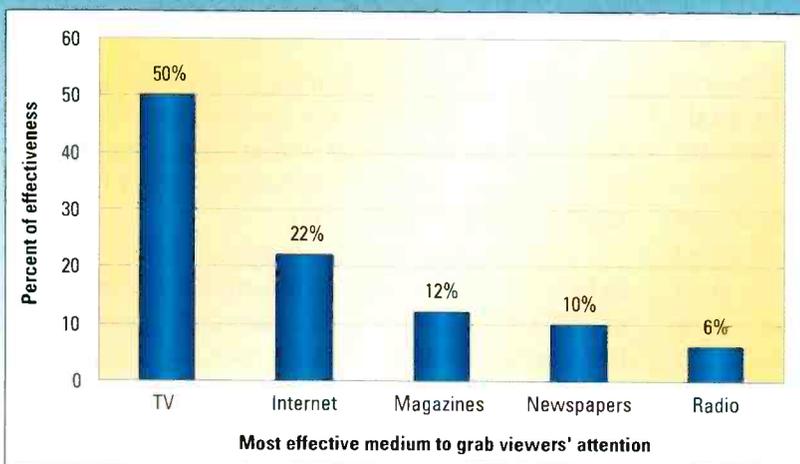
Harmonic distortion occurs when a system whose input is fed with a pure sine-wave signal of frequency f produces at its output a signal of frequency f and a set of signals with frequencies $(2f, 3f, \dots, nf)$ harmonically related to the input frequency. The distortion factor of a signal is the ratio of the total RMS voltage of all harmonics to the total RMS voltage. The performance of audio amplifying devices is expressed in terms of percentage of

FRAME GRAB

A look at tomorrow's technology

TV most effective at getting viewers' attention

50 percent of consumers see TV as most effective media



Source: Burst Media

www.burstmedia.com

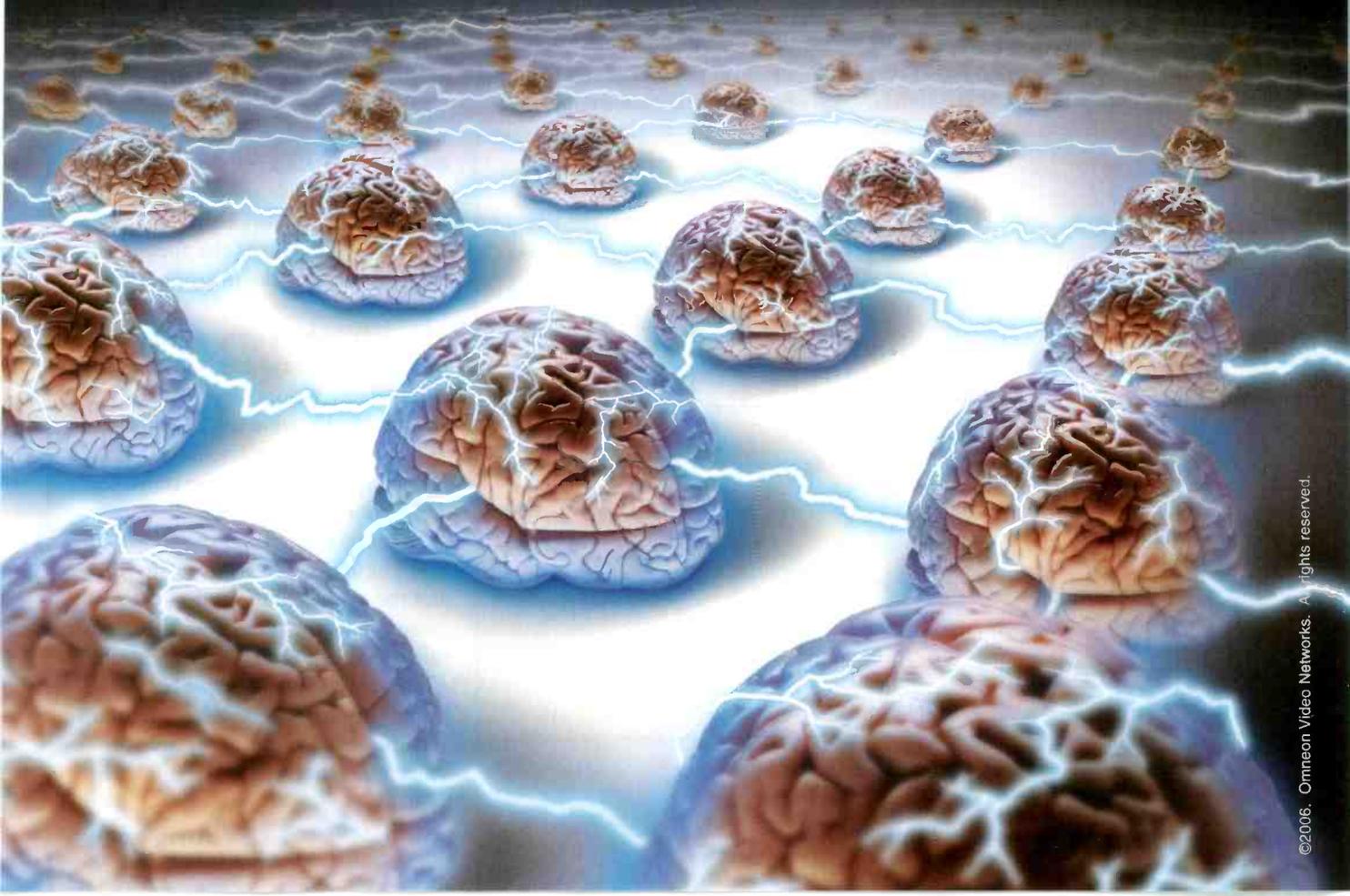
Imagine the productive power of the world's most advanced storage solution.

Engineered after nature's own ultimate active storage system, the Omneon MediaGrid™ content library truly does think for itself. Self-monitoring, self-healing and media-aware, MediaGrid may be more than you ever thought possible from a storage system. With intelligence that helps you access content more quickly, create and work with multiple formats simultaneously and even adapt system bandwidth automatically for high-demand content, MediaGrid delivers breakthrough workflow productivity.

With the introduction of MediaGrid, Omneon unveils the world's first "active storage." Now your content, the processing power to act on it, the network bandwidth needed to access it and the broadcast applications doing the work can all coexist in the same platform. And thanks to an ingenious modular design, future expansion is easy and virtually unlimited. If you've been imagining the world's most advanced storage and processing platform, we'd say great minds think alike.

*Talk to one of our systems experts today.
Call +1 866.861.5690 or visit omneon.com.*

 OMNEON



total harmonic distortion (THD) at a specified output level. For professional studio-quality equipment, the output level THD is measured at 10dB above SOL (+18dBu or +14dBu). This level is called maximum operating level (MOL). The percentage of THD is the distortion factor multiplied by 100. The mathematical expression is:

$$\text{THD} = \frac{\sqrt{E_{2f}^2 + E_{3f}^2 + \dots + E_{nf}^2}}{\sqrt{E_f^2 + E_{2f}^2 + E_{3f}^2 + \dots + E_{nf}^2}} \times 100$$

where:

E_f = amplitude of fundamental voltage

E_{2f} = amplitude of second harmonic

E_{nf} = amplitude of n th harmonic voltage

To measure the THD, the audio analyzer removes the fundamental (first harmonic) component of the distorted signal present at the output of the object under test, and all the remaining energy, including noise and harmonics, is measured. The measurement bandwidth is usually limited to 20kHz. Because of the contribution of noise to the measured results, the method is better described as total harmonic distortion and noise (THD + N). The tests are carried out at several frequencies, such as 50Hz, 100Hz,

1kHz, 5kHz, 7.5kHz and 10kHz. THD measurements at frequencies above 10kHz are irrelevant because the harmonics generated by the object under test are above the audio bandwidth. Figure 2 shows the typical setup for THD measurements.

Intermodulation distortion (IMD) occurs when a system whose input is fed with two signals of frequencies f_1 and f_2 generates at its output, in addition to the signals at the input frequencies, signals having frequencies equal to sums and differences of integer multiples of the input frequencies. The SMPTE IMD test specifies the use of a test signal consisting of two separate frequencies ($f_1 = 60\text{Hz}$ and $f_2 = 7\text{kHz}$) with a respective amplitude ratio of 4:1. The IMD causes the 7kHz "carrier" to be modulated by the 60Hz signal. This results in the generation of sidebands above and below the 7kHz carrier with components at 60Hz and its harmonics. The IMD is computed as:

$$\text{IMD} = \frac{\text{Demodulated signal}}{E_{f_2}} \times 100$$

where: E_{f_2} = amplitude of the 7kHz component.

Figure 3 on page 30 shows the typical setup for IMD measurements.

Noise

Audio signals are affected by noise, which is best defined as an unwanted disturbance superimposed on a useful signal. The noise level is usually expressed in dB relative to a reference value and is commonly referred to as signal-to-noise-ratio (SNR). In professional studio equipment, the reference level for SNR measurements is the maximum operating level (MOL), which is typically the output level at which the THD is 1 percent. Usually, MOL is 10dB above the SOL.

The main source of random noise is the thermal agitation of electrons. Given R , the resistive component of an impedance Z , the mean square value of the thermal noise voltage is given by: $E_n^2 = 4kTB$, where:

E_n = The noise voltage

k = Boltzmann's constant

(1.38×10^{-23} joules/Kelvin)

T = The absolute temperature in Kelvin

B = The bandwidth in hertz

T is usually assigned a value such that $1.38T = 400$, corresponding to about 17°C . The SNR at the output of a system depends on the noise generated by the resistive component of the signal source (e.g., the microphone) and the noise generated by the earliest amplifier stage in the chain. Assuming $B = 20\text{kHz}$ and a microphone with a resistive component $R = 150\Omega$, $E_n = 0.219\mu\text{V}$. This is the theoretical thermal noise of the microphone input circuit.

The microphone preamplifier contributes its own random noise, which considerably reduces the SNR of the system. The situation can be visualized as having an ideal noiseless amplifier whose input is fed by a noise generator. This fictitious noise is called the equivalent input noise (EIN) of the amplifier. The difference between the EIN and the calculated theoretical thermal noise level of the audio signal source is called the noise factor of the amplifier.

The measurement of SNR is a rather involved procedure, and the accuracy of the results depends on a strict adherence to a set of rules. The

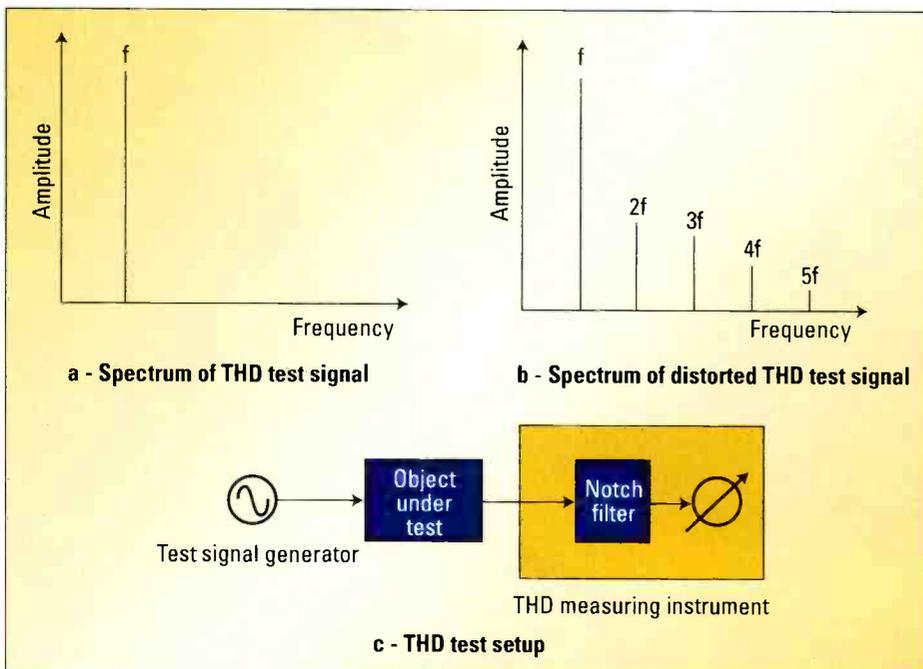


Figure 2. The measurement of total harmonic distortion

BROADCAST | FILM

HIGH DEFINITION OPTICS

A higher standard, now within reach

THALES



HD-e Now the exceptional performance of Thales Angenieux HD lenses is in your range. Our new HD-e series offers the same superlative optics and engineering quality of our Emmy Award winning line of HD broadcast lenses – at a new economical price. Making it possible to raise the level of your productions without breaking your budget. And the new HD-e series measures up in every way to our established reputation for optical and technical excellence in both the film and television industries. With our long history of innovation and leadership, Thales Angenieux makes it easy for you to make the move to a new level of HD performance.



19x7.3 AIF HD-e
Zoom ratio: 19x
Focal length: 7.3-139 mm
MOD: 2'
Weight: 3.7 lbs

10x5.3 AIF HD-e
Zoom ratio: 10x
Focal length: 5.3-53 mm
MOD: 1'
Weight: 3.4 lbs

26x7.8 AIF HD-e
Zoom ratio: 26x
Focal length: 7.8-203 mm
MOD: 3'
Weight: 4 lbs

973-812-3858 • angenieux.com

angenieux
images

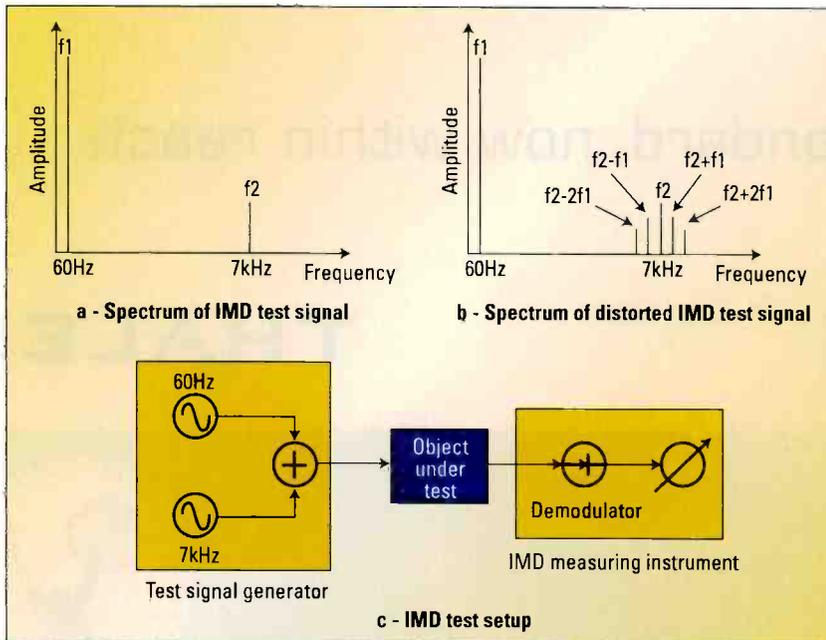


Figure 3. The measurement of intermodulation distortion

routine test procedure illustrated in Figure 4 and described below is suitable for the SNR measurements of an audio mixer:

- Step 1: Disable all inputs except the one in the measurement path. Disable all compressors and equalizers. Feed a 1kHz audio signal at the rated input level (e.g., -70dBu) at the microphone input and adjust input sensitivity, channel gain and master gain for SOL at the output (+8dBu or +4dBu).
- Step 2: Remove the input signal source

and substitute with a low-noise 150Ω resistor. Measure the noise at the output with the audio analyzer in dBu in a 20kHz bandwidth. An optional noise-weighting network may be used to simulate the ear frequency response.

The SNR is given by the difference, in dB, between MOL in dBu and the measured noise in dBu. The use of a weighting network will produce SNR values that may differ by 10dB or more from flat 20kHz bandwidth measurements.

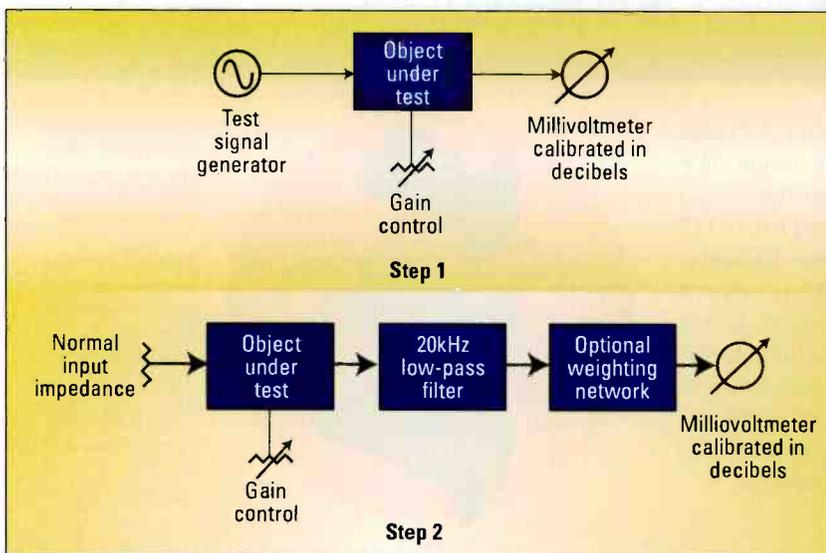


Figure 4. The measurement of signal-to-noise ratio

Periodic noise is generated outside the equipment and coupled in some manner into it. Unlike random noise, periodic noise can be eliminated by good engineering practice. The main type of periodic noise, commonly called hum, is 60Hz, and its harmonics. The measurement of signal-to-periodic-noise ratio is similar to the measurement of signal-to-random-noise ratio except that a 200Hz low-pass filter is used. A spectrum analyzer or oscilloscope may be added to help identify the frequency of the periodic noise.

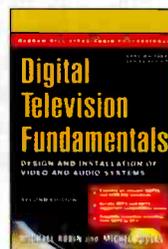
Crosstalk is defined as the injection of an unwanted signal from a neighboring circuit via a mutual impedance (e.g., between signal sources in an audio mixer). The measurement is quite involved. It includes feeding an MOL signal to the unwanted (crosstalking) input and measuring its effect at the wanted path, whose input is loaded with its characteristic source impedance. The two paths have to be adjusted for normal operating conditions. The audio analyzer is connected to the wanted path output, and the input of the crosstalking path is fed with a constant amplitude signal whose frequency is varied in discrete steps or continuously in the bandwidth of interest. The signal-to-crosstalk ratio is expressed in dB with reference to MOL.

BE

Michael Robin, a fellow of the SMPTE and former engineer with the Canadian Broadcasting's engineering headquarters, is an independent broadcast consultant located in Montreal. He is co-author of "Digital Television Fundamentals," published by McGraw-Hill and translated into Chinese and Japanese.



Send questions and comments to: michael_robin@prism2b.com



The second edition of Michael Robin's book may be ordered directly from the publisher by calling 800-262-4729. The book is available from several booksellers.

Euphonix - Audio Mixing for Broadcast

OB Sports

Client: Mobile Television Group
Console: System 5-BP
Notes: One of six System 5 consoles in Mobile Television Group's new HDX Trucks. Euphonix StudioHub Router integrates with the truck's Jupiter and Pesa audio/video router systems.



On-Air News

Client: KVUE Local News
Console: Max Air
Notes: 96 channels of high quality audio controlled from a compact and easy-to-use surface. Max Air is packed with features to make the job of mixing news less stressful and much simpler resulting in a better show.



Production

Client: KLRU 'Austin City Limits'
Console: System 5-BP
Notes: Their System 5 has 132 channels, 48 mix busses, 12 aux busses, and 41 physical faders. Although the show is currently broadcast in stereo it is mixed in 5.1 surround for archiving.



Whatever the application Euphonix has the experience to meet your needs including fully integrating the console's audio router with most router control systems that utilize the ES-Switch protocol.

euphonix.com

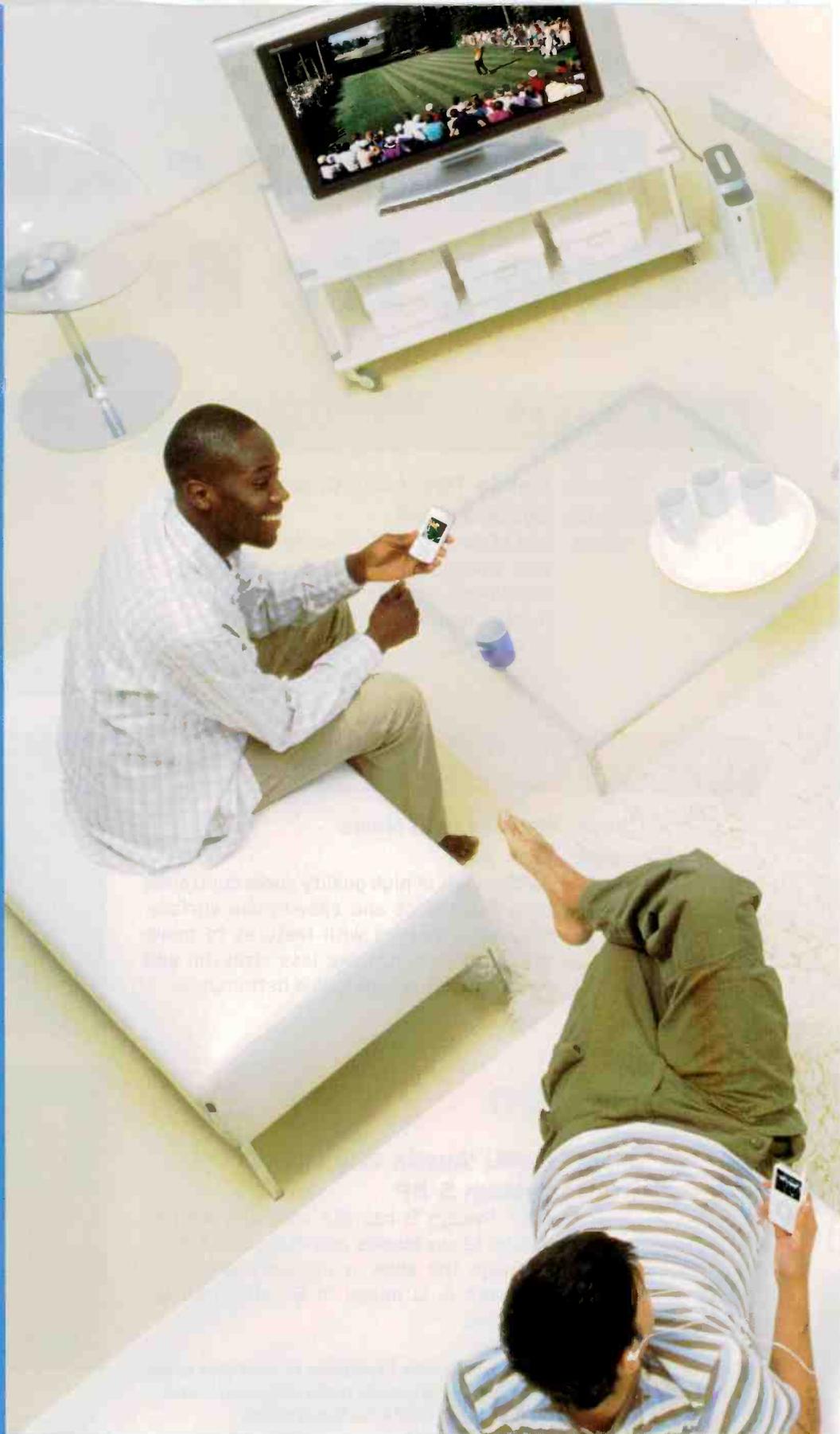
©2006 Euphonix, Inc. All rights reserved
220 Portage Avenue • Palo Alto, CA 94306 • Ph: (650) 855-0400 • Fax: (650) 855-0410

 **Euphonix**
digital emotion

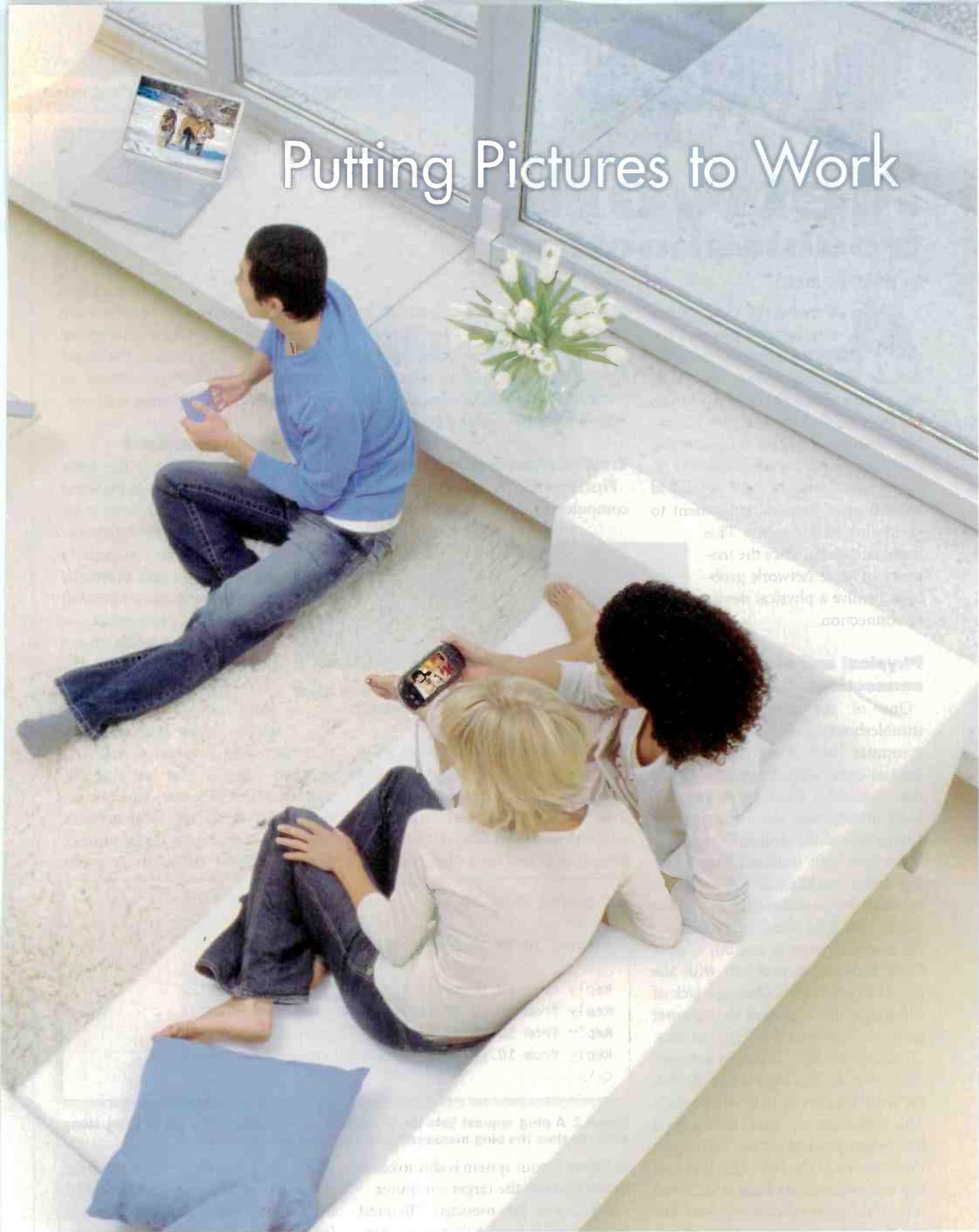
HD, IPTV, mobile TV – the broadcast digital media world is rapidly evolving with new formats and new ways of creating, packaging and delivering “content everywhere.”

Increasing consumer choice means new opportunities for broadcasters and content owners to put their pictures to work and generate extra revenue.

The challenge is to make evolving technology work for you profitably and in harmony with your existing plant.



Putting Pictures to Work



Putting Pictures to Work

SNELL & WILCOX

Network troubleshooting

BY BRAD GILMER



All network architectures rely upon a physical (or RF) connection between devices. Troubleshooting almost always starts with a check of the physical layer of the network. Are the cables connected? Are the wall jacks and patch panels properly terminated?

A whole industry has developed around providing test equipment to verify link performance. This is not surprising since the majority of your network problems involve a physical device or connection.

Physical and electrical connections

One of the most useful troubleshooting tools is the computer itself. Almost all network devices come with diagnostics lights. (See Figure 1.) These lights give you basic information about the network connection to the device.

The link light indicates that a link has been established with another network device at the other end of the cable. This light should stay on continuously. If yours is not on, it most likely indicates a problem with the physical connection, although lack of a link may also be caused by improper network interface card (NIC) drivers.

The activity light indicates network activity. If the link light is not lit, then the network activity light will be dark. This is because you must have a good link before you can see any activity on the network. If the link light is lit and the network activity light is dark but it is blinking on other computers, this means that you have a valid physical and electrical connection, but for some reason, the NIC card in your computer is not seeing any network traffic. This could be because of a

port failure in the network switch, or it could be because of a wiring error. If the NIC lights are working, but you are still having problems, your computer has several programs that can help identify networking problems.

Troubleshooting with ping

First, find the IP address of another computer on the network (the target)



Figure 1. Link and activity lights can tell you a lot about the connection between two network devices.

that is working normally. Next, go to the computer that is having difficulty and open a command line window. Type "Ping [IP address]," where [IP address] is the address of the target computer. If you see a display similar

also mean that the computer you are trying to ping is configured to ignore ping requests. Try pinging the target computer from another system so that you know it is working properly.

Trace route command

Another useful utility is the trace route command (tracert on some systems, traceroute on others). Trace route not only shows the path packets take from one computer to another, but it also shows the time it takes packets to transit from one place to another.

Figure 3 on page 36 shows how trace route can be used to find areas of network congestion. In this example, I use trace route to find the route between myself and xyz.com (this is just an example, not the real XYZ.com). You can see that traffic leaves my local network and then travels on bellsouth.net. Transit time to bellsouth is pretty

```
C:\>Ping 10.10.10.2

Pinging 10.10.10.2 with 32 bytes of data:

Reply from 10.10.10.2: bytes=32 time<10ms TTL=128
C:\>
```

Figure 2. A ping request lists the IP address of the system you are pinging along with the time the ping messages took to transit the network.

to Figure 2, your system is able to communicate with the target computer.

If you see the message, "Request timed out," it means that your computer cannot send and receive messages from the target computer. This could be caused by a problem in your computer or on the network. It could

good — generally less than 6ms. But then on hop 6 at 65.83.236.178, the response time jumps to 24ms. A few hops later, the carrier changes to broadwing.net. We can only assume that the jump in response times happens at a meeting point between bellsouth and broadwing. Next, on

Small Business

**BRAINSTORMS...
IMPOSSIBLE TO PREDICT.
EASY TO CAPTURE.**

**FINALLY, A RANGE OF TOTAL SOLUTIONS
FOR YOUR LIMITLESS IDEAS.**

Now you can bring your most complex design ideas to life with help from Dell and Adobe® Dell Precision™ workstations are high-performing systems. Many are powered by the next generation of 64-bit capable Intel® processors and customizable with advanced graphics, RAID hard drive support, and dual-monitor capability. Dell has partnered with Adobe to deliver powerful video post-production solutions that combine the high performance of Dell workstations with the comprehensive post-production tools of Adobe Production Studio. Together they give you exceptional quality at an affordable price, and the ability to tell your story with the freedom and control offered by Adobe's world-class video and graphics software. These systems offer optimal performance and the added assurance of compatibility between many hardware and software components. So just like your creativity, the sky's the limit.



Adobe Production Studio Standard
Software, documentation or packaging may vary from retail version.



Dell 19" 1907
Flat Panel Display,
add \$309

Dell™ recommends Windows® XP Professional

**NEW DELL PRECISION™ 490
WORKSTATION**

\$3169

Lease as low as **\$84/mo.**, (48 pmts*)
E-VALUE Code: **07726-s40616m**

Scalable, Dual-Processor Capable Workstation

- Intel® Xeon® Processor supporting dual-core processing (3.2GHz, 2x2MB L2 Cache, 1066MHz FSB)
- Genuine Windows® XP Professional
- 4GB Quad Channel* DDR2 Fully Buffered DIMM Memory
- 160GB* (7200 RPM) SATA Hard Drive and 500GB* (7200 RPM) SATA Hard Drive
- 256MB PCIe x16 NVIDIA Quadro FX3500 Graphics Card
- 16x DVD+/-RW* Drive
- 3-Yr Economy Service Plan (Next Business Day On-Site Service*, Hardware Warranty Support)
- Windows Vista™ Capable
- Monitor Not Included

Recommended Upgrade:

- 3-Yr Business Essential Service Plan (24x7 Same-Day On-Site Service*, advanced Hardware Warranty Support), add \$408

**NEW DELL PRECISION™ M65
MOBILE WORKSTATION**

\$1849

Lease as low as **\$49/mo.**, (48 pmts*)
E-VALUE Code: **07726-s40618m**

A Balance of Workstation Performance and Mobility

- Intel® Core™ Duo Processor T2300 (1.66GHz, 2MB Cache, 667MHz FSB); Intel® PRO/Wireless 802.11a/g Dual-band Mini-Card
- Genuine Windows® XP Professional
- 15.4" WXGA Active Matrix Display
- 512MB Shared* SDRAM; 60GB* (5400 RPM) Hard Drive
- NVIDIA Quadro FX 350M 512MB Turbocache* (OpenGL graphics)
- 24x CD-ROM Drive
- 3-Yr On-Site Economy Service Plan (Next Business Day On-Site Service*, Hardware Warranty Support)
- Windows Vista™ Capable

Recommended Upgrade:

- 3-Yr Business Standard Service Plan (On-Site Service*, CompleteCare™ Accidental Damage Service*, advanced Hardware Warranty Support), add \$278

Dell™ recommends Adobe® software with Dell Precision™ Workstations.

Adobe® Production Studio Standard
Adobe offers the essential post-production toolset.

- Package includes: Adobe After Effects® 7.0 Standard, Adobe Premiere® Pro 2.0 and Adobe Photoshop® CS2, Adobe Dynamic Link and Adobe Bridge.

**Special offer only with
purchase of select Dell
Precision™ Workstations***
Only **\$799** Great Value!

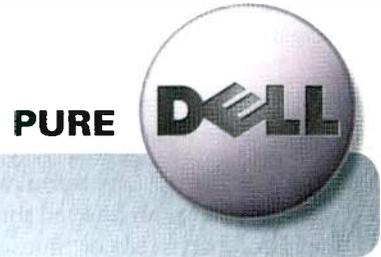
Adobe® Production Studio Premium
Adobe offers a complete post-production solution.

- Package includes: Adobe After Effects® 7.0 Professional, Adobe Premiere® Pro 2.0, Adobe Photoshop® CS2, Adobe Audition® 2.0, Adobe Encore® DVD 2.0 and Adobe Illustrator® CS2 software, Adobe Dynamic Link and Adobe Bridge. **Call for Dell Pricing.**



See how Dell can help your business at dell.com/DCColutions

call 877.778.4829
toll free



Call: M-F 7a-9p Sat 8a-5p, CT *Pricing/Availability: Pricing, specifications, availability, and terms of offer may change without notice. Taxes, fees, shipping, handling and any applicable restocking charges extra, vary and are not subject to discount. Offers may be combined with other select offers or discounts. U.S. Dell Small Business new purchases only. LIMIT 5 DISCOUNTED OR PROMOTIONAL ITEMS PER CUSTOMER. In case of customers leasing under these promotions, please note that items leased will be subject to applicable end-of-lease options or requirements. Dell cannot be responsible for pricing or other errors, and reserves the right to cancel orders arising from such errors. **Adobe Video Collection 2.5 Standard Offer:** Offer valid only with purchase of Dell Precision™ 380, 470, 670, M20 or M70 system. (Adobe offer does not apply to Precision 690 being advertised) Offer excludes N-series systems. (note: ad does not mention limited warranty) **Limited Warranty:** For a copy of our Guarantees or Limited Warranties, write Dell USA LP, Attn: Warranties, One Dell Way, Round Rock, Texas 78682. For more information, visit <http://www.dell.com/warranty>. **Dual-Channel Memory:** Dual-channel memory requires 2 each of the same capacity memory DIMMs. **Dell Precision™ 4GB Memory:** The total amount of usable memory available will be less depending on the actual system configuration. **On-Site Service:** Service may be provided by third party. Technician will be dispatched, if necessary, following phone-based troubleshooting. Subject to parts availability, geographical restrictions and terms of service contract. Service timing dependent upon time of day call placed to Dell. **Leasing:** Monthly payment based on 48-month Fair Market Value ("FMV") QuickLease and does not include taxes, fees, shipping and handling charges. Your monthly payment may vary, depending on your creditworthiness. QuickLease arranged by Dell Financial Services L.P. ("DFS"), an independent entity, to qualified Small Business customers. Minimum transaction size of \$500 required. At the end of the FMV QuickLease, you can purchase the equipment for the then FMV, renew the lease or return the equipment to DFS. Please contact your DFS representative for further details. All terms subject to credit approval and availability, and are subject to change without notice. **CompleteCare Accidental Damage Service:** CompleteCare service excludes theft, loss, and damage due to fire, flood or other acts of nature, or intentional damage. CompleteCare not available in all states. Customer may be required to return unit to Dell. For complete details, visit www.dell.com/servicecontracts. **Hard Drive:** For hard drives, GB means 1 billion bytes; actual capacity varies with preloaded material and operating environment and will be less. **DVD+/-RW:** Discs burned with this drive may not be compatible with some existing drives and players; using DVD+R media provides maximum compatibility. **Trademark/Copyright Notices:** Dell, the stylized E logo, E-Value, UltraSharp, CompleteCare and Dell Precision are trademarks of Dell Inc. Intel, Intel logo, Intel Inside, Intel Inside logo, Xeon, Xeon Inside, Intel Core, Core Inside are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Microsoft and Windows are trademarks or registered trademarks of Microsoft Corporation in the United States and/or other countries. Adobe, the Adobe Logo and Acrobat are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States and/or other countries. ©2006 Dell Inc. All rights reserved.

hop 11, the response time jumps to 63ms. From the URLs, it looks as if this jump occurs somewhere within the broadwing network.

In this example, we are observing congestion (or perhaps delays induced by distance) across the Internet. But trace route can be used equally as well to identify choke points on a local network.

Security

You might not think security belongs in an article on troubleshooting, but I can tell you from firsthand experience that many security issues manifest themselves initially as problems on the network. As the person in charge of maintaining your networks, it is important that you consider security when performance problems arise.

The effects of compromised security on a corporate network can be

may try to communicate with other computers in a distributed denial-of-service attack. This coordinated attack can slow network performance as a large number of computers all attempt to communicate with the same

able in the server, performance suffers dramatically.

As you might expect, streaming servers require a lot of bandwidth, both at the NIC card and on the bus. So, when users complain of slow net-

Many security issues manifest themselves initially as problems on the network.

host at the same time. Be aware that performance issues can point to a security breach in your organization.

Server troubleshooting

If most people on your network use a central server, the problem could actually be an overloaded server. Almost all servers typically have a number of diagnostic tools, which will let you know how heavily loaded they are.

The cause of server performance

work performance, be sure to consider whether the users all connect to a common server, and check the server to see if it is resource-starved.

There is one last place to look when you are troubleshooting network problems: log files. They are created by most modern operating systems and can be helpful. If you are a server administrator, you should look at log files every day. Not only can they help you identify network issues, but they can also provide early warning of security issues.

Summary

When you have problems with your network, you should start by checking the physical and electrical connections to the computer. You can then ping other computers to see if your computer is able to communicate across the network. If you experience performance problems on the network, you can use trace route to see where the problems come from. Remember, problems that appear to be network-related may actually be caused by a

```
C:\>tracert xyz.com
Tracing route to xyz.com [16.23.14.120]
over a maximum of 30 hops:
  1  <1ms  <1ms  <1ms  192.168.1.1
  2   4ms   4ms   4ms  ads1-33-166-1.asm.bellsouth.net [67.33.166.1]
  3   5ms   5ms   4ms  209.149.96.1
  4   7ms   4ms   4ms  205.152.99.161
  5   5ms   5ms   6ms  axr00asm-1-3-1.bellsouth.net [65.83.237.2]
  6  24ms  24ms  24ms  65.83.236.178
  7  30ms  28ms  25ms  65.83.237.210
  8  25ms  26ms  25ms  ge-2-1-0.a1.chcg.broadwing.net [216.140.15.17]
  9  34ms  30ms  29ms  p5-0.gnwd.broadwing.net [216.140.15.141]
 10  46ms  46ms  46ms  p4-0.c0.ftwo.broadwing.net [216.140.15.129]
 11  62ms  63ms  63ms  s7-3-0.c1.atln.broadwing.net [216.140.17.110]
 12  63ms  62ms  63ms  p3-0-0.a1.atln.broadwing.net [216.140.12.38]
 13  65ms  65ms  69ms  65.90.64.94
 14  65ms  65ms  64ms  www.xyz.com [16.23.14.120]
Trace complete.
C:\>
```

Figure 3. The trace route command can reveal the source of network bottlenecks.

substantial. An e-mail worm can slow performance as an infected computer sends out hundreds or thousands of e-mails in an attempt to infect other systems.

Viruses can turn computers into zombies — computers that can be remotely controlled by their attackers. At a prearranged time, the zombies

problems depends on how clients use the server. Database applications are computationally intensive. This can require large amounts of processor and memory resources. Certain operating systems — Windows Server 2003, for example — require large amounts of available memory. If there is not enough memory avail-

lack of available resources on a central server. Finally, if your network suddenly develops problems, remember that the problem may be caused by a security breach.

BE

Brad Gilmer is president of Gilmer & Associates, executive director of the AAF Association and executive director of the Video Services Forum.

ICON™

Create an image, leave an impression.



WEATHER

THURSDAY

H 26°

L 19°

POP 30%



UP NEXT: MARTHA

L 25° LONDON H 15° L 10° NEW YORK H -5° L -10° HONG KONG

Introducing the new Icon family of HD/SD master control and branding products.

Processors

Routers

Servers

Editing

Graphics

Digital Signage

Test & Measurement

Monitoring & Control

Master Control & Branding

Management Software

Networking Equipment

TV & Radio Transmission Systems

H-Class™ Content Delivery Platform



IconMaster™ — HD/SD Master Control, Branding and Channel Release System

Multi-channel, full featured master control with embedded multi-layer branding turning modular master control into a full Channel Release system.



IconStation™ — HD/SD Master Control Graphics and Channel Presentation

Unlimited layering and control of graphics, clips and animations with live data updates, making yours the channel to watch.



IconLogo™ — HD/SD Master Control Channel Branding System

Four independent layers of logo, animation, clock, and crawl insertion including EAS support for essential channel branding and more.

For more information on Icon products visit www.broadcast.harris.com/icon

Canada +1 800 387 0233 | USA East +1 800 231 9673 | USA West +1 888 843 7004 | Latin America +1 305 512 0045

Leitch is a brand of Harris Corporation.



assuredcommunications™

Broadcast • Microwave • RF • Government Systems

www.harris.com

Video server technology: Methods for reliable operations

BY AL KOVALICK

Providing a precise definition of a video server¹ is similar to the blind man describing an elephant; the description will depend on the vantage point of the observer. This is true because the video server comes in several different flavors, and this obscures its persona. In general, there are three classes of video server:

- the standalone AV server with internal storage and/or external storage;
- the clustered server with multiple AV input/output nodes, each connected to one or more storage arrays through a switching network; and
- the edge server with a few AV I/O ports, internal cache storage and file-based import/export using non-real-time (NRT) transfers.

Each of these server types also has control ports, monitoring/diagnostics ports and the usual timecode and video reference ports.

Figure 1 illustrates the first of three server types. The top section shows the generic video server with M input ports and N output ports. SDI video, composite, ASI, AES/EBU audio and video/IP are some input/output format types. Additionally, a LAN connection is customary for NRT and/or real-time (RT) file transfer. Optionally, there may be a connection (SCSI, Fibre Channel or Ethernet) for external storage access. In general, this architecture can represent the standalone server or the edge server

(as described earlier), depending on how the device is configured and used.

The standalone server model is the workhorse of our industry and is used in the capacity as VTR replacement, small clip server, play-to-air server for TV news operations and a host of other applications. The edge server model is typically loaded (or unloaded) with content via NRT file transfers from distant storage

Each I/O node has little or no internal storage and has the I/O richness of the standalone server. Importantly, an AV node is not a video server but rather a “media client.” However, the combination of a node plus storage offers all the functionality of a video server. The distinguishing features of the cluster are immense, including expandable external shared storage, a common file system that all nodes share and a switching network for

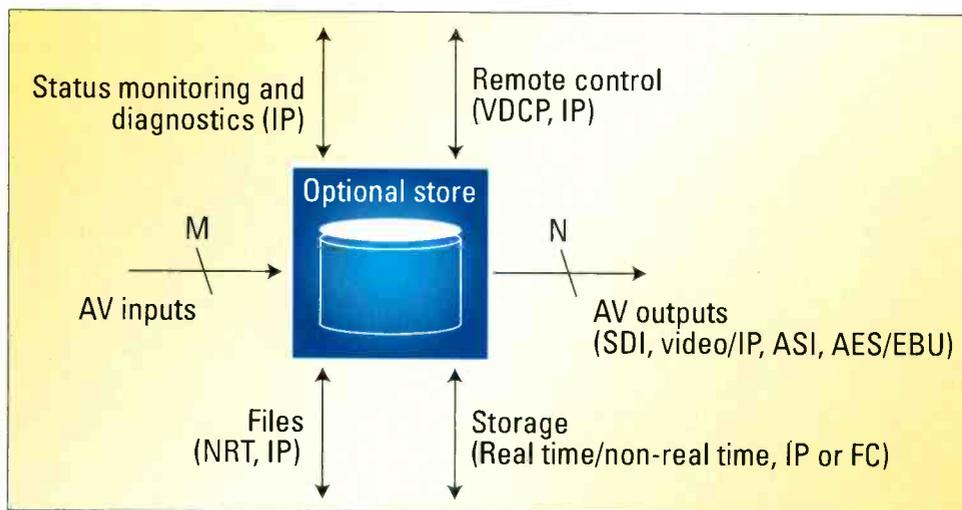


Figure 1. The standalone AV server has internal storage and/or external storage.

systems. Applications run the range from remote digital signage to low-cost AV ingest and playout nodes attached to inexpensive NRT storage systems.

The clustered server model is depicted in Figure 2. (See page 40.) Clusters are used in situations that require large I/O counts (100+) with support for 1000s of hours of shared AV storage. Nodes and storage are added as needed to meet usage demands.

nodes to access storage. This configuration requires a high level of reliability across the file system, switching and storage systems. Some switching systems use a hybrid combination of Ethernet, Fibre Channel or IEEE-1394 connectivity and may require non-trivial protocol translators inside the network.

Next, let's study a pool of techniques for creating high availability video servers.

ICONIX

The World's Smallest HD Video Camera

What Could You Do With a Dozen?



Multi-Format:

- 720p @ 24, 25, 30, 50, and 60 Hz
- 1080i @ 50 & 60 Hz
- 1080p @ 24, 25, 30, 50 and 60 Hz

ICONIX Video, Inc.

HD-RH1

- 3-1/3" Progressive Square Pixel CCDs
- Dual Link HD-SDI, DVI-D, and Analog Outputs
- 14-Bit Quantization

800.783.1080

iconixvideo.com



Built to last

First, let's look at some common reliability techniques that can be applied to all three classes of video server. In the big picture, reliability is linked to maintainability, including remote servicing and diagnostic ability. A feeble ongoing maintenance policy will result in overall poor reliability, regardless of how much attention is given to hardware/software reliability and stability. So, excellent maintenance practices are a prerequisite for high-availability operations. What else is needed?

Consider the generic standalone server and media client noted in Figures 1 and 2. To keep them running at peak performance, each needs swappable dual-power supplies with associated AC access to dual-power rails, dual (or more) fans, protected storage and spare I/O ports. All servers and media clients also have an internal controller with CPU, DRAM, glue logic and often hard disc storage.

not all of them. Element duplication results in improved unit reliability but does not provide truly fault-tolerant operation under all conditions. Such a unit may be described as having a single point of failure (SPOF) — the controller CPU, for example. It's less expensive to configure two mirrored

The amount of protection should be proportional to your business needs and budget.

Storage protection methods typically use RAID. RAID is a family of separate methods ranging from a 100-percent mirror of all stored data to using clever data parity tricks to

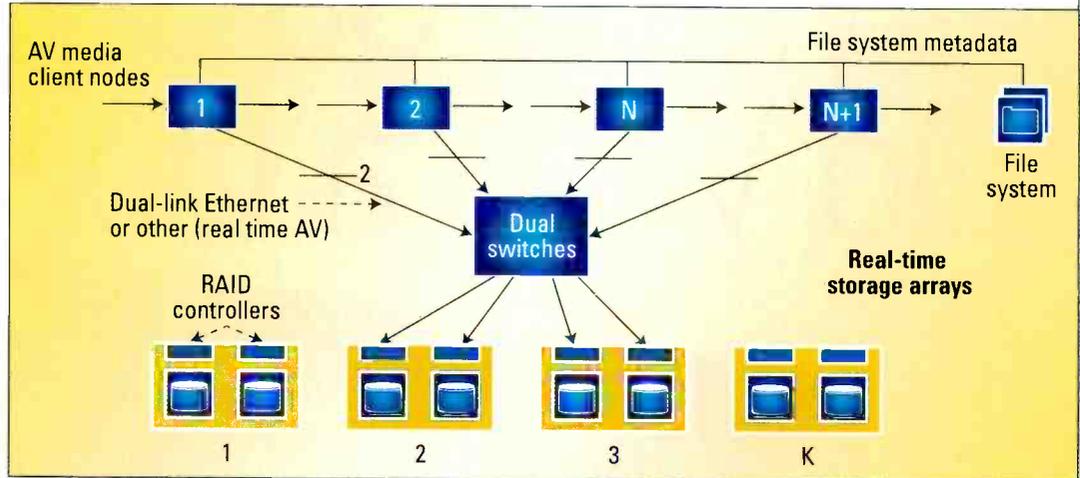


Figure 2. The clustered server has multiple AV input/output nodes, each connected to one or more storage arrays through a switching network.

In the end, it's not practical to build a single server or node that has duplicated every internal component.

It's not practical to duplicate the controller portion of the server or node because transferring from a failed to spare controller is extremely difficult and not feasible in practice. And who of us would not implicate software (executed on the internal controller) as a potential failure component?

In the end, it's not practical to build a single server or node that has duplicated every internal component. So, most servers in use today sensibly duplicate some internal components, but

SPOF servers running in parallel than to design a single unit that has no single point of failure (NSPOF) performance. However, two SPOF servers running in lock-step parallel do offer an NSPOF operational mode; if one server node fails, the other replaces it immediately or acceptably quick.

Everlasting storage

Storage is an essential part of most video servers. With hard discs clocking in at 500GB per unit in 2006, it is common practice to store 1000s of hours of RT online AV. As more AV content is stored, higher storage reliability is demanded. For the small edge server or single VTR replacement server, there may not be any storage protection. However, for most mid- to large-size server systems, storage protection strategies are used.

recreate missing or corrupt data, including losing an entire drive. RAID 3 and 5 use data parity and require less storage overhead compared with a pure data mirror (RAID 1). Real-time RAID performance requires careful array design and copious testing to guarantee that any R/W data anomaly is corrected. This is one area where manufacturer experience and field-proven products are a valuable metric when selecting a server vendor.

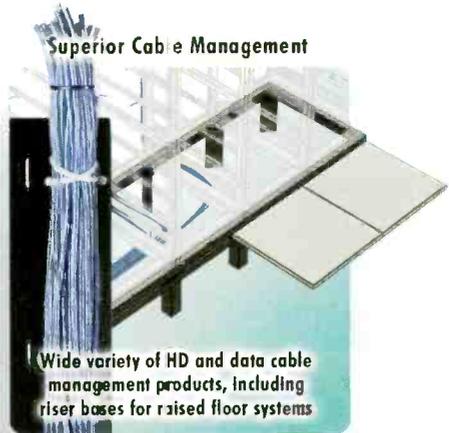
Let's see what might happen when a single hard disc fails completely, as in array number two (Figure 2) with eight drives using RAID 3. Reconstruction kicks in and, using stored parity information, the system begins recreating data from the missing drive. However, if the bad drive is not replaced quickly, the remaining seven drives of data are at risk if another drive fails.

Also, detecting and recreating the missing data in real time is both art and science. When the bad drive is replaced, RAID methods rebuild the data image using an automatic

The **New** Broadcast Standard.

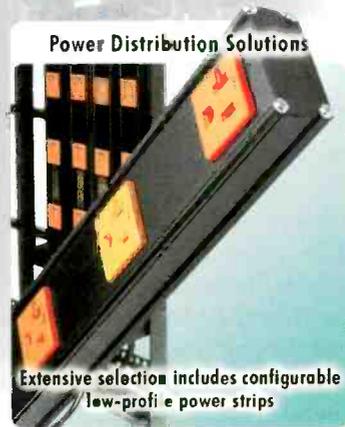


**VRK Series
Broadcast Rack Systems**
Fully welded cabinets
support 2,500 lbs. of
equipment and cable



Superior Cable Management

Wide variety of HD and data cable management products, including riser bases for raised floor systems



Power Distribution Solutions

Extensive selection includes configurable low-profile power strips



SEISMIC
CERTIFIED



LISTED

Essential Code Compliance
NO EXTRA CHARGE

For 27 years, integrators have consistently called on Middle Atlantic Products for professional racking solutions. With racks and accessories engineered to save time and ensure reliable installations, we provide a complete line of products for an effective integrated system. Our commitment to excellence extends beyond our innovative products to providing service and support that exceed your expectations.

Call us at 800-266-7225 to plan your next broadcast installation



Middle Atlantic Products, Inc.

INTEGRATED



architectural



thermal



cable



power

SOLUTIONS



Request our
NEW 2006
Broadcast
Brochure

800-266-7225 | middleatlantic.com
info@middleatlantic.com

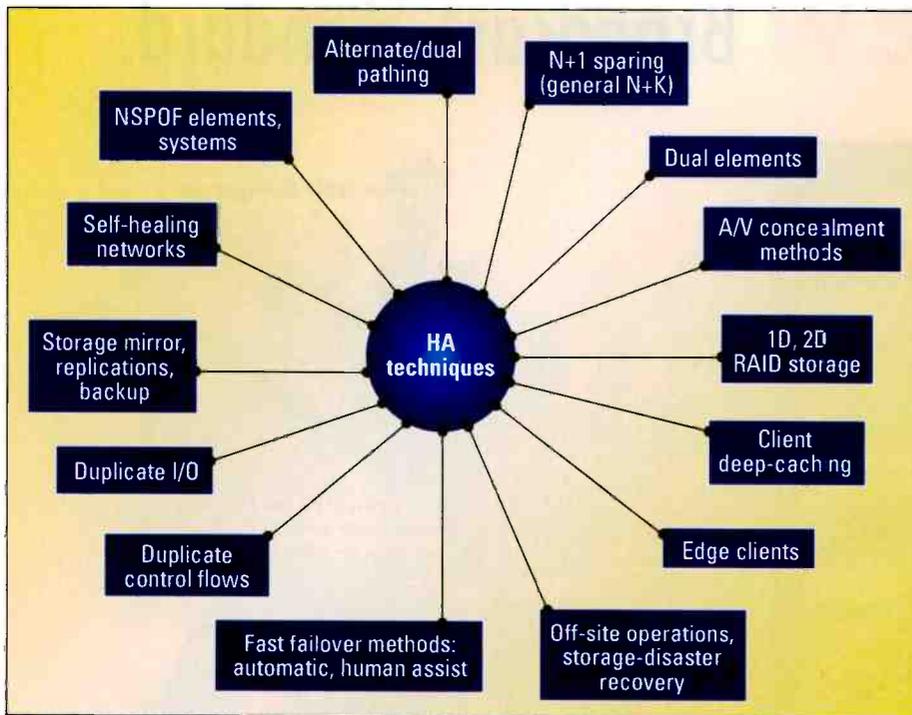


Figure 3. Many techniques are available to assure excellent uptime with NSPOF system-wide.

background process. It's important that the rebuilding procedure does not steal valuable "user" bandwidth with consequent loss of some AV I/O. It's always good to ask the providing vendor if server performance is sacrificed during a RAID rebuild.

Providing RAID storage is a necessary but not sufficient condition for bulletproof storage access. Also needed are dual RAID array controllers, a passive array backplane, and dual-power supplies and fans. Only then can an array be classed as NSPOF. Figure 2 on page 40 shows arrays each with dual controllers. The media clients must decide when to abandon an R/W transaction and switch to the alternate link but doing so without loss of data. As imagined, this requires excellent system engineering and testing.

RAID is not the only tactic for storage protection. A new method called Redundant Array of Independent Nodes (RAIN) was recently introduced by Avid in the Unity ISIS storage system. RAIN uses storage blades (nodes) in a novel configuration, providing 100-percent uptime with

NSPOF storage protection, and transparent background blade rebuilding.

Other techniques

The clustered server requires the most reliable hardware and software operation. Why? Because with more I/O and more storage at risk — com-

pared with the isolated standalone server — many different techniques are needed to assure excellent uptime with NSPOF system-wide. In addition to the methods previously discussed, the following methods are often applied. (See Figure 3.)

- *Dual links from a media client.* Using alternate links provides redundant paths to the storage via the switching network.
- *Redundant switching.* The Fibre Channel or IP switching network needs redundant switches for failover

as needed.

- *Redundant file system controllers.* In the event that all nodes share a common file system, the file metadata controllers must be duplicated.
- *N+1 sparing.* A spare node (number N+1) sits in standby mode until put into service. If node #2 fails, external control logic switches I/O from #2 to node N+1. The delay in switching nodes is a strong function of the speed at which a failure is detected. While it's true that the I/O nodes are SPOF designs, with proper failover, the entire system can be virtually NSPOF.
- *Automation redundancy.* In many cases, I/O nodes are under the control of external automation schedulers. Here it is wise to use dual controllers because if one system fails, the

alternate can take over.

- *Self healing.* This is design in automatic healing by using fast route-around techniques.

Conclusion

The methods mentioned in this paper describe high-availability video

No one method will guarantee NSPOF operations. However, all of these techniques mean that today's servers with outstanding availability are practical.

servers. No one method will guarantee NSPOF operations. However, all of these techniques mean that today's servers with outstanding availability are practical. **BE**

Al Kovalick is a strategist and fellow with Avid Technology and author of "Video Systems in an IT Environment: The Essentials of Professional Networked Media" (www.theAVITbook.com).

¹ RT is used to describe data movement in the "real time video" sense whereas NRT implies AV data transfer rates other than real time.

More HD programming.
More dramatic imagery.
More reasons to choose Canon.

FIELD

(Sports, Entertainment
Special Events)



DIGI SUPER100xs

DIGI SUPER86TELExs
 DIGI SUPER86xs
 DIGI SUPER75xs
 DIGI SUPER60xs

SD

DIGI SUPER62
 DIGI SUPER62TELE

STUDIO

(Drama, Sitcom, News,
TV Game Shows)



DIGI SUPER 22xs

EXCLUSIVE! COMPACT LENS

DIGI SUPER25xs
 DIGI SUPER23xs

PORTABLE

(News, Documentary
Sports, Reality TV)



NEW! ENG/HD

H 17ex7.6B SERIES

H11ex7.7B SERIES
 H11ex4.7B SERIES
 H21ex7.5B SERIES
 H22ex7.6B SERIES
 MJ40x14B IASD-V
 MJ40x10B IASD-V

HDxs

Maximize Your Camera's Performance.

Find out more at canonbroadcast.com

1-800-321-HDTV (Canada: 905-795-2012)

Canon

image*ANYWARE*

©2006 Canon U.S.A., Inc. All rights reserved. Canon is a registered trademark of Canon Inc. in the United States and may also be a registered trademark or trademark in other countries. IMAGE*ANYWARE* is a trademark of Canon.

**Recognized
by NAB attendees**



NAB AIM Award - 2006

**... and
major trade
publications
alike**



TV TechSTAR Award - 2006

openGear



**The most innovative,
customer-friendly advancement
to terminal equipment.**

"Our panel of editors and columnists walked the show floor in search of innovative and ground-breaking new products," said Tom Butts, TV Technology Editor. "The products and technology we selected made the cut - they demonstrated their ability to help advance the acquisition and dissemination of audio and video in the professional video marketplace."

openGear

**an open-architecture,
control system ready,
terminal gear platform,
designed by Ross Video,
available to everyone.**

Ross Video is proud to introduce openGear, an exciting new concept in broadcast terminal equipment solutions. openGear is based on an open-architecture, control system ready 2RU modular frame, designed to accommodate up to 10 cards.



A wide variety of openGear cards are available from terminal equipment vendors supporting the openGear platform allowing facilities the freedom and flexibility to choose the best technology for their particular application.

Feature Product



Ross UDC-8225
Multi-Definition broadcast quality
Up / Down / Cross Converter



Eric Goodmurphy
RossGear Product Manager
Ross Video
"It's all about ensuring that our customers have the best product for the job"
www.rossvideo.com/opengear



Michael Jordan
Director of Sales, Ward-Beck
"Finally, a non-proprietary terminal gear platform that puts the customer's needs first."
www.ward-beck.com



Gene J. Zimmerman
President, Cobalt Digital
"openGear allows our customers the freedom and flexibility to customize their terminal gear installation to suit their needs."
www.cobaltdigital.com

**keep your options open
ask for openGear**
www.rossvideo.com/opengear



Cool Practical Technology™

Tel:(613) 652-4886
solutions@rossvideo.com

Turning online services into revenue

BY BARB ROEDER

As with many new technologies, the novelty of streaming television content created the push for broadcasters to develop their online presence without much heed to their ROI. As the industry matures, there is growing evidence that streaming media can be a profitable arm of a broadcaster's business model. This is in part due to the audience's tolerance for advertising and pay-per-view services. It is also in part to the sophistication of ad insertion and tracking mechanisms that have developed over the past five years.

The effectiveness of online advertising

In today's market, streaming media capitalizes on the prevalence of broadband connections and the tech-savvy consumers who use them. CBS SportsLine reported record-breaking online coverage of March Madness, delivering more than 19 million video streams over the course of the playoffs. In addition, it reported an average viewing time of more than

two hours during its broadcast of the Masters golf tournament. (See "Web links" on page 51.) Large audiences glued to computer screens rather than television sets can certainly justify some investment in advertisers' dollars.

Businesses may also be more willing to pay for online advertising because their audiences have learned to respond more positively to these promotions. A recent study by the Online Publisher's Association shows that 31 percent of online viewers have

measurable and trackable, which can be an even greater advantage than over-the-air advertising. While these behaviors are relatively new, and the advertisers are understandably wary of the new technology, the trend may be that online advertising can exceed revenues from traditional channels in the future.

Types of online advertising

Online advertising, in the form of banner ads, pop-ups and sponsored

As the industry matures, there is growing evidence that streaming media can be a profitable arm of a broadcaster's business model.

clicked through to Web sites making online offers during a streaming media presentation, and 8 percent actually made purchases as a part of these actions. (See "Web links" on page 51.)

The advantage, of course, is that this direct impact on the business' ROI is

links, has a clear presence in the Web environment. Banners and links can use animated GIFs or Flash to catch viewers' attention and may be more effective than pop-ups because they are not subject to pop-up blockers that exist today.

New developments in Flash technology allow video to be incorporated into banners, as well as be integrated into a video stream using pre-roll, post-roll or interstitial ads within a program. While many content providers are still trying to fit into a broadcast model using 30-second or one-minute ads, this new technology lends itself to more flexible approaches that can capture a viewer's attention in much less time — even in odd increments.

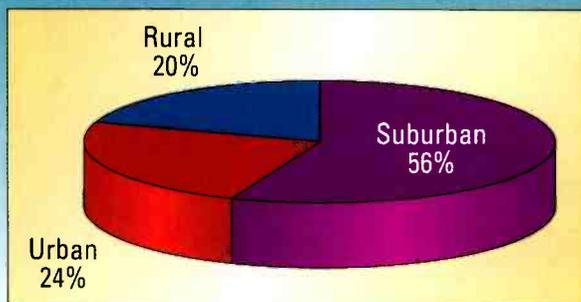
The online audience is no longer in a sit-back-and-be-entertained mode, so repurposing television ads may not be the most effective means for broadcasters to reach viewers and hold onto their advertising dollars.

FRAME GRAB

A look at the consumer side of DTV

DVR users by geographic location

Fifty-six percent of DVR users live in a suburban area.

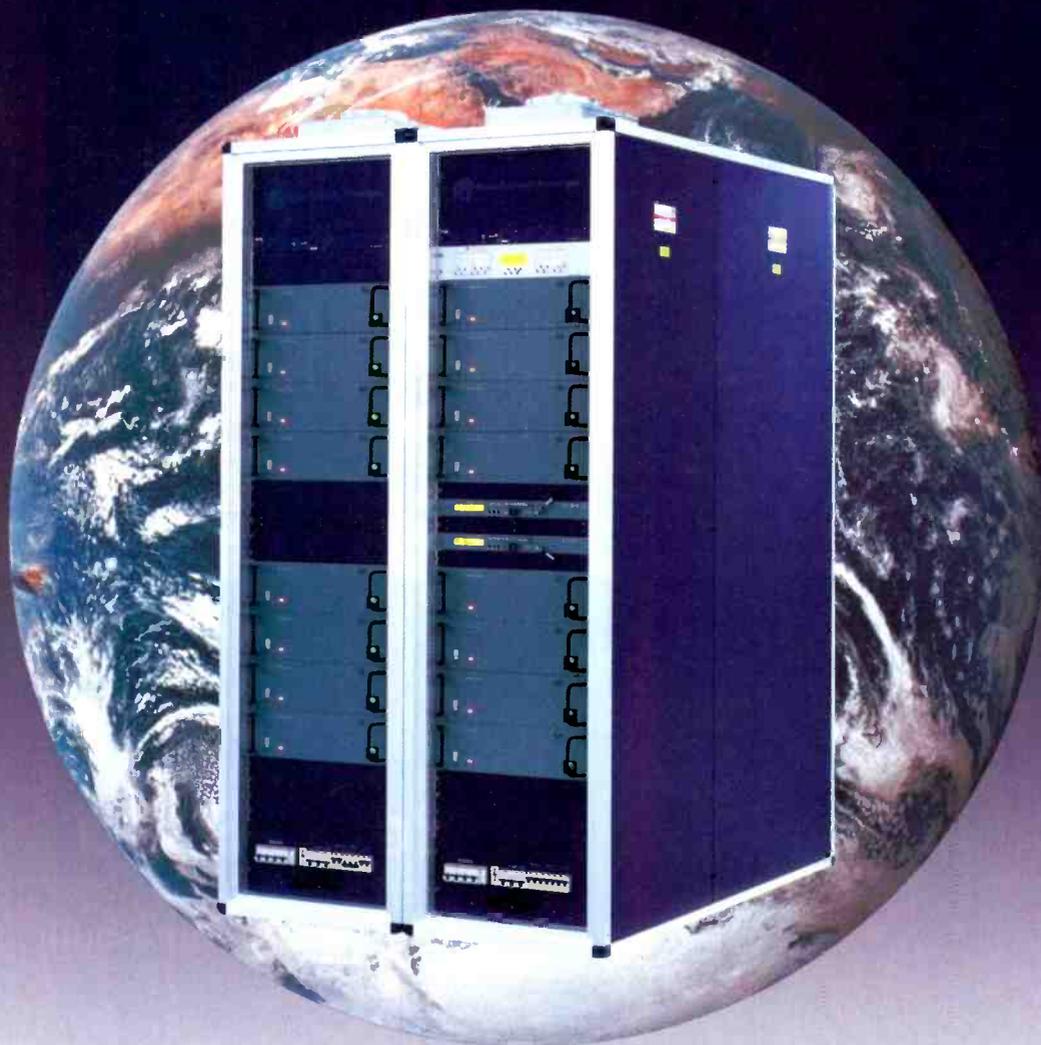


Source: The Carmel Group

www.carmelgroup.com

S O M E O N E H A S T O M A K E

The World's Best Transmitters



Proven Transmitter Technology For Today's Digital World.

You can depend on DMT USA to provide solutions tailored to your needs. Whether it is a transmitter, translator, antenna or complete RF system, our broad range of proven products and customer care give you the options to make educated decisions. Discover the advantages of DMT.



ONE COMPANY · ONE MISSION · QUANTUM RESULTS

888-912-8326 • sales@dmtonline.us • www.dmtonline.us

Several companies offering ad insertion services use rollover interaction that will expand the video window and allow viewers to become more engaged in the advertisement without clicking through and leaving their original source.

Tracking online user behavior

Tracking online user behavior can be a major boon to the online advertising community. Web logs can determine how much of a stream is watched, or whether a banner ad or sponsored link initiated a click-through by the viewer, giving advertisers more assurance that their message is effective. Sites also offer sweepstakes to collect user demographics and data for mailing lists that can be an additional source of revenue.

Microtargeting, or tracking specific users' behavior and targeting ads

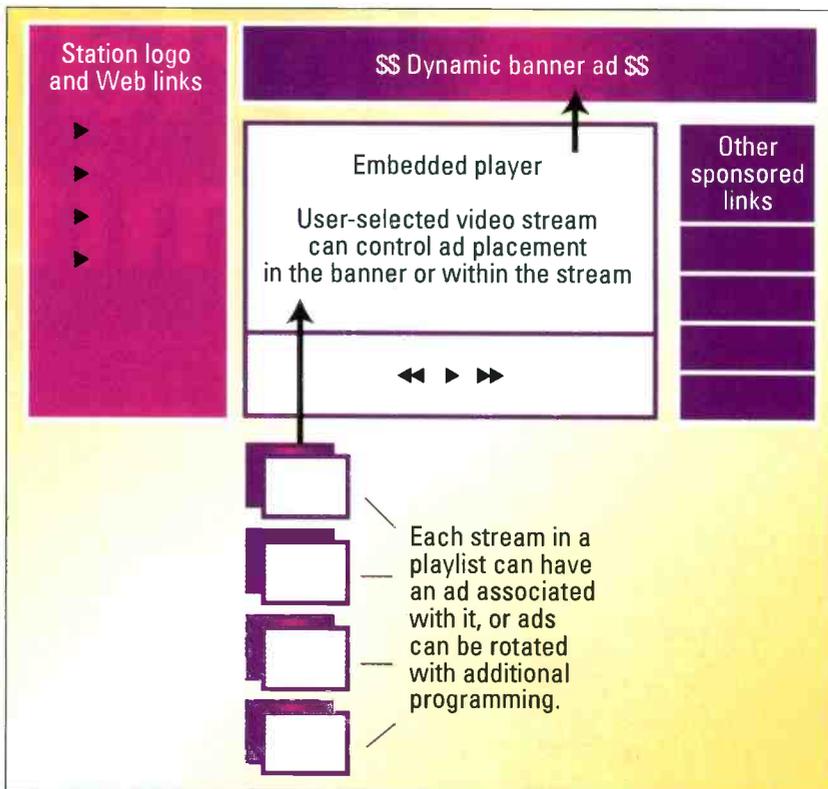


Figure 1. An example of a streaming content playlist

RTS[®] Intercom Series
Innovating the Future of Communications



RKP-4

- Wireless Intelligent Matrix Keypanel
- UHF Frequency Agile
- Digital Encryption



CRONUS

- 32-Port Matrix Expandable to 128 Ports
- Advanced DSP
- Modular Architecture

Rock-Solid
alternative to the old, tired, & home-built systems.

More Affordable
than you think.

Telex Communications, Inc. | 12000 Portland Avenue South | Burnsville, Minnesota 55337 | Phone: 1-800-392-3497 | Fax: 1-800-955-6837 | www.rts.intercoms.com

TELEX
COMMUNICATIONS
BE HEARD

eXtreme performance

The new XR video modulators and demodulators offer wild capabilities.

DM240 XR DVB-S/S2 Modulator

- 30% Bandwidth Savings
- 1-250 Mb/s QPSK/8PSK/16QAM
- Gigabit IP/HSSI/ASI/G.703
- Upgrades to S2 and higher speeds



DD240 XR DVB-S/S2 Demodulator

- 30% Bandwidth Savings
- 1-250 Mb/s QPSK/8PSK/16QAM
- Gigabit IP/HSSI/ASI/G.703
- Upgrades to S2 and higher speeds

HE4000 HD and SD Encoder

- HD & SD Encoding Simultaneously
- Up to 5 Stereo Audio Pairs
- Available internal DVB-S2/S Modulator
- 1-160 Mb/s with built-in color Monitor



HD4000 HD and SD Decoder

- Selectable HD or SD 4:2:2 or 4:2:0
- Supports BISS and Embedded Audio
- Available internal DVB-S2/S Demodulator
- Color Video Confidence Monitor

Phoenix: 602-437-9620
San Diego: 858-805-7000
UK: 44-1420-540233
Singapore: 65-6225-4016
Beijing: 86-10-65831975
Latin America: 561-487-7972

RADYNE

TIERNAN

A Radson Company

www.radn.com
NASDAQ: RADN

catering to their particular interests, is used today for specific product showcases, such as Amazon.com, and usually gets end-user consent as members register to a site. While privacy concerns abound, individual tracking and demographic targeting for more effective advertising certainly lends itself to the personal nature of Internet delivery.

Development platforms

Flash has been the primary development platform for streaming advertisements, though much of the same functionality can be achieved in Microsoft's Windows Media or Real formats using SMIL or ASX. Originally from Macromedia, which was recently purchased by Adobe, Flash's success has been its ubiquitous nature in cross-platform delivery environments, claiming installation on

98 percent of all desktop computers. The most recent improvements to Flash video, including integration of On2's Truemotion VP6 codec, allow true ad insertion and full control over a browser page even as the video is playing. But this requires the use of Flash 8. Fortunately, automatic updates allow end users to easily install newer versions, making the experi-

For true integration with streaming content, playlists consisting of a series of program segments are created using XML and then delivered with the ads interspersed. Some programs may be more suited to the use of specific ads, or a more sophisticated approach can rotate ads as a user views multiple playlist items. (See Figure 1 on page 48.) Flash is ideal for this because it

Tracking specific users' behavior and targeting ads catering to their particular interests, is used today for specific product showcases.

ence more seamless than in the past.

Broadcasters can invest in Flash development resources or rely on several outside companies to create products and services for the interactive, flexible content required for ad insertion.

is an object-based programming environment, allowing authors to create reusable components for their Web site deliverables.

For streaming media delivery, Flash also has numerous tools for

FIRST in routing.

Behind the scenes. Ahead of our time.

Since 1989, the biggest names in TV broadcast, entertainment and post production have trusted NVISION award winning technology behind the scenes to keep them years ahead of the times.

THE FIRST synchronous AES router for audio, 1992

THE FIRST time code router with digital signal processing (US patent awarded), 1992

THE FIRST bidirectional machine control router with dynamic port management (US patent awarded), 1996

THE FIRST large-scale HD-SDI router (US patent awarded), 1998

THE FIRST integrated multichannel master control switcher and multiformat router, 2003

THE FIRST large scale digital video router small enough for mobile trucks, the award winning NV8288, 2006

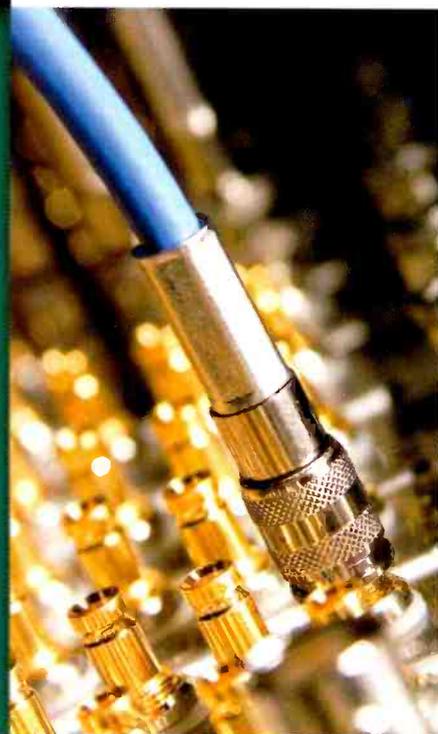
If your business depends on managing large numbers of quality video and audio signals, turn to NVISION, the leaders in HD, SD and digital audio routing systems.

Dolby E
PARTNER

+1-800-719-1900

www.nvision.tv

NVISION®



controlling the entire Web site environment. Flash 8 introduces several new components for customizing skins, or player applications that embed the video directly in the Web site, keeping viewers focused on the entire message rather than being distracted with pop-up windows. Cues can be embedded into a Flash video stream to control the content appearing on the page as well. So, for instance, as a user selects a particular video to watch within a playlist, not only can a streaming ad be played, but a static banner can also be customized to his or her particular interests. Targeted ads such as these can draw a higher rate of return to the sponsor and therefore attract more advertising dollars to the broadcaster.

Prior to its latest incarnation, Flash video encoding relied on an older standard based on H.263. It had a reputation for lower quality and required higher bit rates to achieve the quality of other proprietary formats, such as Real and Windows Media.

Recently, On2's VP6 codec has proven to be a competitive technology for encoding various types of content in addition to including support for alpha channels useful for green screening. (See "Web links.") On2 offers the Flix video encoder tool to create Flash video from the original source, as well as a QuickTime exporter plug-in that can be purchased to run in any QuickTime video production tool, such as Apple's Final Cut Pro or Adobe Premiere.

In-house development of ad insertion technology requires a fairly substantial investment in Flash and Web development resources. Efficient delivery that takes advantage of these technologies also requires the Flash Communicator server for proper communications and streaming to the end user. Companies offering these specialized services can handle both creation and delivery.

As this industry grows, we will see more embedded advertisements, product placements and hot spots within the video stream itself. This will come as the technologies for content creation, including Flash and MPEG-4, mature. And they likely will be more common with video that is created exclusively for online audiences — unless we see a push for more interactive television in the future. **BE**

Barb Roeder is a consultant and president of BarbWired (www.barb-wired.net).

Web links

CBS SportsLine

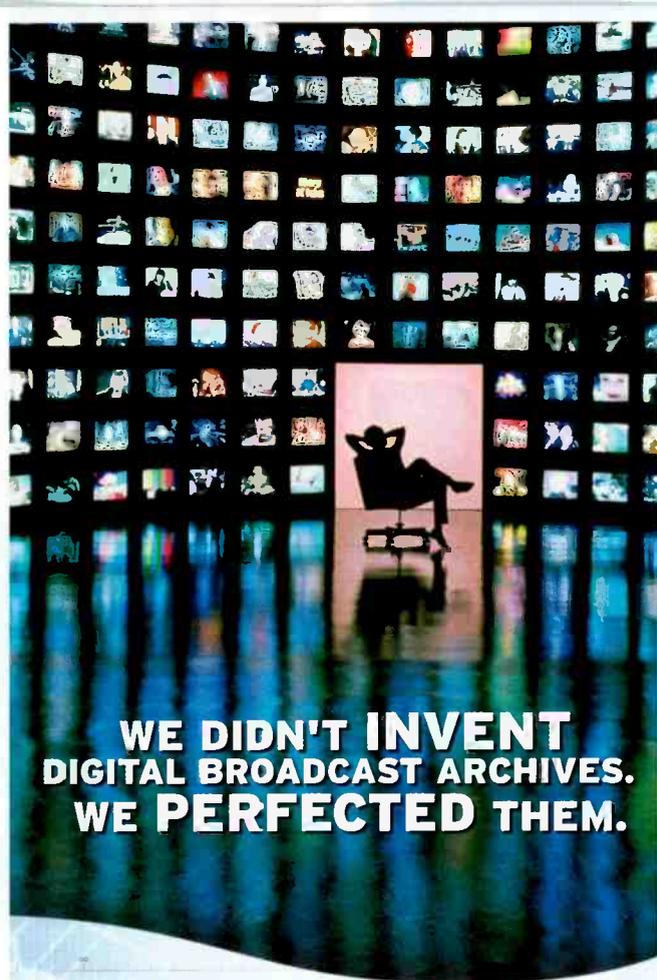
<http://broadcastengineering.com/newsletters/sports/20060428/CBS-SportsLine-20060428/index.html>

Online Publisher's Association

www.online-publishers.org/?pg=press&dt=032906

"Proprietary codec 2006: Choosing and using the optimal video codec"

www.streamingmedia.com



**WE DIDN'T INVENT
DIGITAL BROADCAST ARCHIVES.
WE PERFECTED THEM.**

**More RESOURCES. Broader SOLUTIONS.
Deeper EXPERTISE.**

Front Porch Digital and StorageTek have accelerated the evolution of integrated archive systems, with custom DIVAcomplete installations at more than sixty facilities worldwide. Now that Sun has joined forces with StorageTek, the team that perfected digital archives is even stronger.

Together, we manage mission-critical archiving in the world's leading broadcast, cable and satellite facilities. We'll tailor-fit each system to your specific requirements. With unparalleled design, delivery, and support for our custom-fit software and storage hardware solutions, we make sure you have the archive system that's perfect for your facility.

Our customers are names you know and respect, and no other archive management vendor can match the quality of our references. Call us today to see here why your company should be on this list, too, and why nothing less than perfection will do.

For more information, call Front Porch Digital today,
or visit us online at www.fpdigital.com.
US: 936.520.6042, International: +33 4 50 88 37 70
DIVAcomplete@fpdigital.com





Pick Hits54

The top 40 new products from this year's show — selected by readers like you.

The 2006 Pick Hit judges:

Jim Boston, consultant
Mark Brown, SignaSys
Paul Byers, WQED Multimedia
Philip J. Cianci, consultant
David Danto, Lehman Brothers
Perry Drogo, TECADS
Sid Guel, consultant
Glenn Hall, Hewlett-Packard
Steve Hathaway, Agile Aura
George Maier, Orion Broadcast Solutions
Brian Murray, consultant
Lasse Nurmi, Morgankane
Jeremy Ruck, consultant
Dan Stark, consultant
Augusto Villaseñor, Globecomm Systems
Bob Wyatt, KSPS-TV

Product Jackpot58

Almost 200 hot new products from this year's NAB convention.

Want more? See the NAB Special Report packaged with this issue.

Technology Seminar ...58

Our writers and engineers provide insight into the convention's products and technology.

Editors 58

By L.T. Martin

Cameras 62

By Barry Braverman

Storage 69

By Michael Grotticelli

TM&M 76

By Philip J. Cianci

RF 84

By Don Markley

Automation 90

By Jim Boston

Audio 94

By Tom Patrick McAuliffe

ENG 96

By Phil Kurz

IPTV 110

By Phil Kurz

Encoding Decoding Converting



Take your media encoding workflow to the next level with
Compression Engine and Compression Master.
Increase performance, efficiency and quality without any sacrifices.

Compression Master



Compression Engine



Popwire delivers industrial-strength media coding solutions to the professional media industry.
Popwire's media coding suite simplifies the process of multiple format encoding and transcoding.

Our customers include broadcasters, traditional TV production companies and operators.

Popwire delivers state-of-the-art coding systems that increase the return of investment for digital media producers.

 **popwire**
www.popwire.com

PICK HITS

NAB2006

Autoscript +Voice-Plus+

203-338-8356; www.autoscript.tv

An intelligent prompter module to WinPlus; eliminates the need for talent or operator to manually control the speed of text on a teleprompter; requires no training; the system simply follows the spoken word of the talent.



Autoscript GoPrompt15

203-338-8356
www.autoscript.tv

Compact prompting system; uses a 15in TFT display; is easy to set up and configure; im-

ports scripts from a USB, so no laptop or cables are required; wireless hand control is supplied as standard equipment.



Avid Media Composer

800-949-2843
www.avid.com

Professional film and video editing software for Mac and Windows; new features include motion tracking and stabilization, full-screen video output over DVI, and HD editing for Mac OS X Tiger systems; combines HD, SD, DV and film formats and resolutions without rendering.



Avid Mojo SDI

800-949-2843
www.avid.com

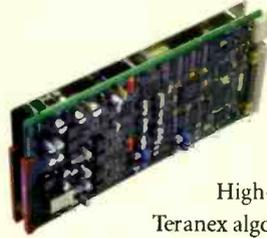
Media Composer NLE with Mojo SDI interface; handles DVCPRO HD and HDV, as well as uncompressed digital SDI I/O and IEEE 1394, component, composite and S-video signals; supports up to eight channels of embedded audio plus four channels of AES/EBU.



Axcera Axciter

800-215-2614
www.axcera.com

A completely reprogrammable digital TV exciter; is easily field upgradable with new software versions; system includes AXACT dynamic digital pre-correction and DTVision digital signal analysis; features a VGA front-panel display; supports slave-mode and SFN operation.



Axon Digital Design HSU20/21

+44 118 973 8920
www.axon.tv

High-end upconverter based on advanced Teranex algorithms; is compatible with ADD-ON Synapse systems; runs on two HQV Realta chips from Silicon Optix, providing 2 trillion ops; features two processed outputs, SD/HD-SDI input, 576i to 1080i/50 or 720p/50 conversion, and 480i to 1080i/59.94 or 720p.59.94 conversion.

Blackmagic Design On-Air

702-257-2371; www.blackmagic-design.com



Real-time HD mixing console with the power of Multibrige Extreme; provides a complete live TV production studio; supports two cameras; provides HD-SDI quality, direct recording to disk, graphics keying, genlock outputs and full camera monitoring; is a free software update for all Multibrige Extreme users.

BTX Technologies SnakeJet

800-666-0996; www.btx.com



An 18-channel, 75Ω coax video multi-connector; supports HD signals; consists of a breakout box on each end inter-linked with an 18-channel HD video coax snake; replaces 18 BNCs; available in 2-, 4- or 10-connector breakout versions.



Canon Console

800-321-4388; www.usa.canon.com

Software designed for either Canon XL H1 or XL2 cameras; allows professional control over multiple-camera record and play functions; provides menu-driven image control and storage interface for both record and play environments; includes built-in vectorscope and waveform monitoring.



Cinegy air

202-742-2736
www.cinegy.com

Completely software-based automation and playout server; relies on open IT architecture; supports all standard video files from DV to 1080i HD MPEG-2 long GOP 4:2:2; control via TCP/IP interconnect; scalable to hundreds of channels; supports closed caption and Dolby E pass-through.



Dielectric TFU-UT

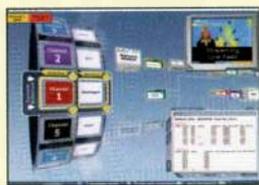
207-655-4555; www.dielectric.com

Economical turnstile, low-power broadband UHF antenna; simple feed system; uses two batwings in a turnstile design, eliminating half of the needed feedlines; allows for dual inputs supporting single channel or for the simultaneous broadcast of two or more channels without combiner.

Evertz 7780TSM

905-335-3700; www.evertz.com

A complete embedded hardware-based solution for IPTV stream monitoring; when combined with a Vistalink Pro NMS, system provides tools to continuously and effectively monitor MPEG-2/H.264 signals in any IPTV network; provides auto-response scripting, multicast stream redirect and real-time monitoring; is SNMP-enabled.



FBBT Matador

+44 2890 317990

www.fbbt.co.uk

Business monitoring software; monitors, manages and helps control workflow by collecting, organizing, consolidating and leveraging network data from broadcast production, playout and transmission systems; can reduce salary and training costs of engineers and support staff by 25 percent; reduces disruptions and outages.

Floral Acuitas



352-372-8326

www.acuitastv.com

A file-based automation and asset management and playback software solution; based on non-proprietary computer

hardware; users can ingest, tag, play and archive digital content; supports single, multistation and multichannel environments; auto-reconcile traffic; drag-and-drop operation; is compatible with most legacy equipment.

Hamlet AR2-E8SHD

949-597-1053; www.hamlet.us.com



A rack-mounted 2RU professional audio monitor; decodes eight

channels of Dolby E and AC3 from HD-SDI, SD-SDI or AES signals; features LED displays for each HD-SDI or SD-SDI channel; auto sensing inputs, four AES or analog pairs inputs and HD/SD-SDI reclocked output.



Harris PTM-305

513-459-3400

www.broadcast.harris.com/videtok

Portable, PDA-sized battery-powered personal test and measurement instrument; supports multiple formats; includes two video signal generators, color and waveform monitor, vectorscope and audio analyzer/monitor; features an integrated 320 x 240 color LCD touch-screen display; runs on standard AA batteries for up to four hours.



Holophone H4 Super Mini

416-362-7790; www.holophone.com

A compact surround-sound microphone providing six channels of audio capture; is ideally suited for live-event TV broadcasts; features on-board multichannel pre amps and a virtual surround headphone monitor and encoder; generates matrix-encoded surround-sound output for stereo infrastructures; aux central channel mic XLR input.



Iconix HD-RH1

800-783-1080

www.iconixvideo.com

Miniature multiformat HD camera; supports all popular formats: SDI, DVI-D and analog outputs; offers electronic shutter and enhancement, fully programmable features and functions, 1/3in progressive square CCD capture, c-mount lens and 14-bit quantization; features five user-adjustable gamma settings and three user-programmable scene files.

Image Video IMD-1

416-750-8872; www.imagevideo.com



A compact video monitor display processor with auto detecting SDI or DVI outputs; supports 16:9 and 4:3 aspect ratios on both inputs and outputs; offers line-level audio output and four GPI inputs; monitors for frozen and loss of video detection; is compatible with Image Video's line of tally controllers.



Inlet Technologies Semaphore

919-856-1080

www.inlethd.com

Comprehensive video analysis software facilitating quality control for Windows Media and VC-1 content; identifies encoding flaws down to the frame level; features stackable graphs on displays, customizable automation and control, user-settable encoding thresholds, which allow immediate identification of errors, and exportable frame-level statistics.

PICK HITS

NAB2006

International Datacasting SFX2100

613-596-4120; www.intldata.ca



A satellite multimedia server appliance with internal hard drive and

multimedia content management and distribution software; features a standard 40GB drive that is upgradable to 120GB; offers easily customized configurations; supports sync, async and terminal interfaces; is part of the SFX2100 series of receivers.

LARCAN MXi Series



303-665-8000
www.larcan.com

Low-power UHF transmitter; supports analog, digital, DVB and DVB-H standards; outputs 10W

to 200W digital; touch-screen LCD display provides telemetry and control; is frequency agile; features a broadband design using LDMOS amplifiers and regulated power supplies; its compact housing with integrated cooling system supports operation under extreme conditions.

Microwave Radio MTX-4000

800-490-5700; www.mrcbroadcast.com

Companion ENG encoder/modulator for the CodeRunner 2; offers user-selectable COFDM and single-carrier QAM modulation; 50Mb/s in a 12MHz channel or 100Mb/s in a 25MHz channel; connectivity options — IEEE 1394, USB 2.0 and Ethernet; supports SDI, HD-SDI and ASI or analog NTSC/PAL video.

Middle Atlantic TEMP-DEC



800-266-7225
www.middleatlantic.com

A rack-mounted temperature display; monitors internal enclosure temperature and provides an LED readout; fits into any Decora-style opening; features adjustable over temperature setting and local and remote overtemp notification.

Miranda ASI-Bridge CAM



514-333-1772
www.miranda.com

A camera-mounted HDV-to-ASI converter; provides direct transmission of HDV footage

or HD recording to an MPEG-2 server; can be combined with the HD-Bridge DEC to create a long-range HDV newsgathering system; accepts HDV via IEEE 1394 connection; supports SD 525/625, HD at 720p and 1080i and ATSC.

Network Electronics SDI-IP-GTW

801-495-1635; www.network-electronics.com



An IPTV gateway solution for the transmission of uncompressed SDI over an IP network; no compression equipment needed; offers real-time, broadcast-quality contribution and distribution over WAN networks; provides user-selectable FEC modes for high QoS; is transparent to embedded AES audio or other VAC data.



Neutrik OpticalCon

732-901-9488
www.neutrikusa.com

A fiber-optic connector based on standard LC-duplex design; provides safe and rugged connectivity; supports LC connectors or OpticalCon connectors; integrated gold-plated contacts allow the use of up to four copper wires for power or data; features a SMPTE-compatible wire arrangement and additional ground-shell contact.



Omneon MediaGrid

866-861-5690; www.omneon.com

Enterprise-level active storage for large digital media files; combines grid storage and grid computing through the use of multiple intelligent, interconnected and independent storage servers; composed of ContentDirectors and ContentServers; interconnection via redundant GigE; is highly scalable, reliable and manageable.



Popwire Compression Master 4.0

+46 8 726 75 00; www.popwire.com

Desktop video encoding platform; converts to and from all common formats, including MPEG-2, MPEG-4, QuickTime, DV, H.264, 3GPP, Flash and Windows Media; supports distribution to satellite, Web, broadcasting, DVD authoring, iPod and 3G mobile phones.



RK Enterprises MMRB-15

562-902-9200

Field confidence monitor for news and sports applications; offers a 15in LCD color screen with 1024 x 768 resolution; features a sturdy aluminum housing, RF input and optional 601 input; is standard C-mount camera battery-powered and tripod-mountable; provides 16:9, 4:3 or 16:9 stretch aspect ratio display.



Snell & Wilcox Helios

818-556-2616; www.snellwilcox.com

Software-based conversion platform; runs on open-standards IT hardware; provides Ph.C phase correlation motion estimation; can be used in both stream and file-based domains; capabilities include resizing, reformatting and reshaping of images for maximum viewer impact; supports MXF metadata.



Sony XDCAM HD

201-930-1000

www.sony.com.sg/pro/bp/

HD camera system offering flexible capture and recording functions, including user-selectable frame and data rates, interlace or progressive capture; up to two hours of storage on 23GB optical Sony Professional Disk media; supports MXF; uses 1/2in Power HAD CCD with 12-bit A/D signal processing.



TASCAM FW-1082

323-726-0303

www.tascam.com

Audio interface and control surface; supports FireWire and video editing software; includes four high-quality mic preamps with phantom power and compressors, line inputs and digital I/O, unique control surface acts as three surfaces in one — Mackie control protocol, editing surface for NLE applications and a MIDI control surface.

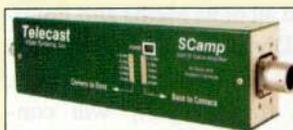


Tektronix Cerify

800-426-2200

www.tektronix.com

Automated system for checking/verifying file-based digital video content; automatically checks all aspects of video files, including encoding, standards compliance, resolutions, bit rates, and video and audio quality; supports all standards; logs errors, informs automation systems and transmits e-mails; Web-browser user interface.



Telecast Fiber Systems SCamp

508-754-4858

www.telecast-fiber.com

An inline repeater for 311M copper/fiber cable; receives and re-transmits optical signals on each fiber at -7dBm; is powered by the camera's base station; features 15dB of new optical budget and integral optical power metering.



Thomson Grass Valley Infinity

800-547-8949;

www.grassvalley.com

A multiformat camera platform; supports 1080i50/60, 720p50/60, 525i/60 and 625i/50; records at DV25, JPEG2000 and MPEG-2 SD and HD; records/plays from integrated REV PRO drive and professional-grade CompactFlash media; supports HD-SDI, CVBS, TC and AES audio; IT-based interfaces include three USB, one FireWire, HDMI display and GigE.



Tiernan HE4000

602-437-9620

www.radyne.comstream.com

Dual program video encoder; can simultaneously encode one HD and one SD video stream, as well as up to four stereo audio pairs; supports 1Mb/s to 160Mb/s encoding on 4:2:0/4:2:2 signals; features a two-pass encoding process and built-in video upconverter and downconverters.



VAC VT-1

800-821-0426; www.vac-brick.com

Video tester measures gain and EQ levels anywhere in a composite video system; LED readouts make levels easy to read; has BNC connections; 12V AC power supply available.

Wohler Touch-it

510-870-0810; www.wohler.com



An audio and video monitor with router; 7in touch-screen LCD monitor allows users to select from 12 displayed asynchronous composite video inputs and 12 stereo analog audio inputs (audio version only); selectable 4:3/16:9 aspect ratios and active video loop outputs.

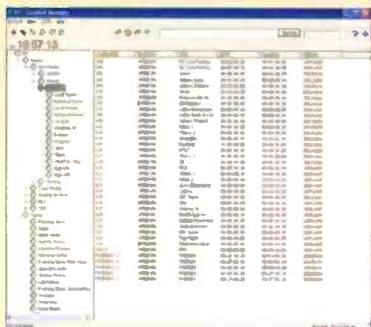


VertigoXmedia Xstation

514-397-0955

www.vertigoxmedia.com

Package to create, schedule and air complete DTV subchannels incorporating national, regional and local content; SD/HD video and graphics; includes hardware, software, data-parsers and asset management; RAID storage; compatible with Xmedia Suite.



AUTOMATION
Digital Transaction
Group (DTG) Xe

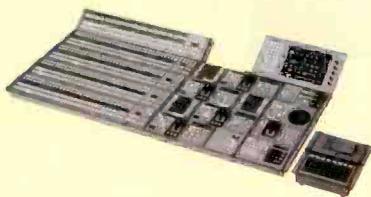
In combination with Microsoft SQL Server 2005, Xe enables customers to better manage and deliver content and provide a platform for open, interoperable data sharing and exchange for file-based workflows; SQL Server 2005 delivers increased scalability, availability and security to enterprise data and analytical applications, while making them easier to create, deploy and manage.

800-243-2001; www.dgtv.com

PROGRAM OPTIMIZER
Dolby DP600

Supports file-based infrastructure and workflow; includes intelligent audio analysis and automated loudness normalization engine; offers Dolby E, Dolby Digital and Dolby Digital Plus encoding; automates quality control process in faster than real time; intelligently and automatically sets, validates and corrects audio metadata parameters without the need for decoding and re-encoding.

415-558-0200; www.dolby.com



VIDEO ROUTER
Sony IXS 6000 series

Hybrid routing switcher series supports SD and HD video, AES digital audio and RS-422 control signals all within the same mid-size matrix; sizes of 16 x 17 to 128 x 136; handles balanced digital audio matrices of 32 x 34 up to 256 x 272; supports Sony's S-Bus communications protocol for backward compatibility.

800-686-7669

www.sony.com/professional

TECHNOLOGY SEMINAR

Editors

BY L. T. MARTIN

Despite attendance topping 105,000, several of the biggest players in post production didn't have major editing announcements at NAB2006, which only left more time to examine the others who did.

What was worth seeing

Adobe unveiled the latest version of its Adobe Production Studio software last January, but it was still worth visiting the company's NAB booth to see how well Dynamic Link

MacBook Pro laptop system, which functions as fast as previous desktop towers.

However, some product partners are extending the reach of Apple's Final Cut Pro editing software into the realm of the digital intermediate (DI) with AJA Video's release of the new KONA 3 v2 card and Blackmagic Design's new MultibrIDGE Extreme 5.5 board. Both leverage the new PCI Express architecture on the Power Mac G5 Quads to handle 2K



Interplay, an NLE collaboration system, was introduced at the Avid booth. The company also released software-only versions of Media Composer for PC and Macs. NAB2006 convention photos by Douglas Schwartz.

can interchange files between editing in Adobe Premiere Pro 2.0, massaging image content and parameters in Photoshop CS2, and creating effects in After Effects 7.0 Professional without any intermediate rendering.

Apple brought a universal version of its Final Cut Studio suite of post-production software to the show, but the company did not even bother hosting a press conference to unveil it. In fact, despite the admirable stability of Final Cut Pro 5.1 cutting 24p material on both the existing Power Mac and new Intel-based Mac platforms, one of Apple's most impressive introductions was the new 17in

resolutions. To reach those resolution heights in 10-bit RGB, Bluefish444 also announced it would be supporting Final Cut Studio across its entire product line, including a new 2K/HD driver for the SD|Greed video card, due out later this year.

Autodesk demonstrated that it has transferred all of its Media and Entertainment Division software products over to the Linux operating system. Although, the company will continue to support its legacy versions developed on the SGI OS. This has given Autodesk's Discreet line a significant speed boost with Discreet Inferno now providing five times the

performance on Linux that it offered on earlier SGI platforms like the Onyx 2.

The company also unveiled 10-bit RGB versions of its Discreet Smoke and Flint systems and brought out Autodesk Toxik 2007, a collaborative compositing software for feature film production. It now includes a paint system capable of working on high-resolution, high-dynamic range images.

The leader of the post-production parade, Avid, made a major announcement at NAB2006. The company introduced Interplay. This announcement almost overshadowed Avid's much anticipated release of software-only versions of the company's Media Composer systems for both PC and Mac.

Interplay is being touted as the world's first nonlinear workgroup collaboration system, giving everyone in the production chain integrated asset management, workflow automation and security control through a single system. The heart of Interplay is a client/server engine that works with any member of the Avid

for color correction. The new software provides support for Windows Media and includes EDIUS Speed Encoder for HDV, enabling fast HDV video output.

Canopus also presented EDIUS Broadcast, which incorporates all of the EDIUS Pro real-time editing capabilities in a streamlined interface. Designed to help post-production specialists get content to air quickly, it provides enhanced support for industry-standard formats, including Panasonic DVCPRO P2, DVCPRO 50, DVCPRO HD and VariCam; Sony's XDCAM; Windows Media; and, of course, Grass Valley's own Rev Pro storage from its IT-centric Infinity camcorders.

DVS introduced the latest version of CLIPSTER, a DI workstation that can handle up to 4K files on the set of a digital cinema shoot. CLIPSTER can now output in JPEG2000 for digital cinema applications and has a new content management system called Spycer, which can search through hundreds of terabytes of storage. Another DI system, the Nucoda Workstation from Digital Vi-

Showing the fruits of it Canopus acquisition, EDIUS Pro 4 NLE was launched at the Thomson Grass Valley booth.

Unity MediaNetwork shared storage systems to form the backbone of a completely interoperable media production environment. It offers a facility-wide workflow that tracks all Avid projects, as well as more than 100 media and non-media file types, including multi-resolution video, Microsoft Office documents, Adobe Photoshop and After Effects layered files, MPEGs, TIFs and spreadsheets.

Showing the fruits of its Canopus acquisition, EDIUS Pro 4 NLE was launched at the Thomson Grass Valley booth. Version 4 features include multicam support for up to eight cameras, nested sequence editing, improved trimming tools and new parameter-based keyframe support

tion, handled 4K files with the power of its 17 processors, which are based on AMD's latest AMD64 multi-core technology.

The Media 100 line of NLEs, seen under the umbrella of its new owner Boris FX, now includes the Media 100 HD suite. It adds integrated 3-D compositing, titling and effects along with its new version 11 software to bring uncompressed 10-bit HD editing to Mac OS X systems.

The new Media 100 HD, an entry-level HD option, can mix legacy Media 100 content with multiple QuickTime codecs and native DV material on the same timeline. If all you need is an SD editor, the company also now offers the Media 100 SDe, which



LCD MONITOR Panasonic BT-LH2600W

A 26in HD production-quality LCD monitor; true 16:9 widescreen panel with a one-piece design, high resolution and low delay, and a 700:1 contrast ratio; offers integrated HD-SDI and SDI I/O with embedded audio; includes waveform monitor that graphically displays luminance levels from -5 to 108 IRE in any of the monitor's four corners; features Split Screen/Freeze Frame function for scene comparison and critical color matching (live input vs. freeze frame).

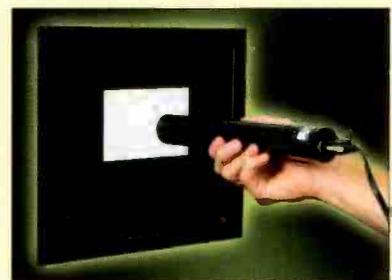
800-528-8601

www.panasonic.com/broadcast

HDTV UPCONVERTER Snell & Wilcox Quasar

Uses motion estimation from Ph.C to produce clear and sharp HD outputs from SD inputs; handles video, film, graphics and mixed media; converts SD 525 and 625 material to 720p and 1080i HD formats; internal frame sync; supports embedded, AES and compressed audio; handles closed captions.

818-556-2616; www.snellwilcox.com



LCD COLOR ANALYZER DK Technologies PM5639/06

An LCD color analyzer that checks color temperature and luminance levels; features a smart RGB bar graph display with zoom function that makes white balance alignment easy and intuitive.

+45 44 85 02 55

www.dk-technologies.net

CONVERTER

Teranex Mini

A handheld, portable DTV format converter that converts SD video to and from HD in real time; enables HD field monitoring and conversion of SD camera and graphics sources to HD; has SD/HD-SDI inputs and outputs along with optional DVI, analog component and HDMI outputs; may be used to feed a VTR, display or video projector.

407-858-6000; www.teranex.com



**DIGITAL VIDEO ROUTER
NVISION NV8288**

Features Gennum's 3Gb/s HD/SDI chipset; is specifically designed for use in video production trucks and other applications where space is limited; built for HD, supports all standard SD data rates; is ASI-compliant; can be configured for systems ranging in size from 12 x 12 up to 288 x 576; all modules, including power supplies and cooling fans, are front-serviceable and hot-swappable.

530-265-1000; www.nvision.tv



**CAMERA ROBOTICS
Vinten Radamac
Fusion range**

Comprising a controller, head and pedestal with a single underlying control system, enables operation of all current Radamac and Autocam products together with the new Fusion range pan and tilt head and pedestal.

845-268-0100; www.vinten.com

TECHNOLOGY SEMINAR

features a modular design that allows users to add functions as their needs increase. Media 100 systems should be compatible with Intel-based Macs by this fall.

NewTek claimed to be the world's fastest video editor by running its new SpeedEDIT software on the APEXX 8 workstation from BOXX Technologies. The workstation is powered by 16 AMD Opteron processors. SpeedEDIT combines three-wheel color correction and four-band color selection and enables all editing functions to be performed directly within its unique timeline and storyboard interface.

Quantel has added the new eQ FX to its product line. eQ FX provides proprietary technologies, such as Quantel's TimeMagic acceleration hardware, 160 minutes of HD workspace, and the QColor in-context color-correction package of software and dedicated controls, including the latest Eiger 3.5 software. The company's latest real-time 4K color corrector, Pablo, performed real-time pan and scan by pulling a continuous 1.15GB of data from the disks.

Lightworks is stretching into mainstream broadcast post production with its new Alacrity MR system, which is designed for both multiformat HD and also multicam editing. Although it retains the familiar rotary "nudge" control that has made Lightworks systems the choice of many film editors accustomed to working on a flatbed edit table, the system adds sophisticated color correction and 3-D DVE effects capabilities to the swimming grounds of its familiar red shark icon.

At the Sony booth, attendees could see the XPRI NS family of NLEs based on the XPRI software platform. This new line includes a laptop field editor, a journalist's proxy editor and a full-resolution finishing system. XPRI NS is now an integral part of the SONAPS news production system. Sony also demonstrated its clever new Cinescore software that creates soundtracks based on

themes and variations rather than music loops. Cinescore is capable of generating an unlimited number of fully-orchestrated compositions as WAV files, which are customized to a video project's duration and can be imported into any NLE.

The old made new

Proving that everything old becomes new again, Editware brought a new linear edit system to NAB2006



NAB2006 enjoyed increased traffic with more than 105,000 registered attendees and exhibitors.

— the LE-2000. It can be used to replace the Sony BVE-2000, which Sony discontinued last year. Editware's system has a unique dedicated control panel, including jog and shuttle control, and can be configured to control from four to 10 source devices.

Why introduce a linear editor today when disk-based post is dominant? Many facilities have audio mixers and video switchers with a lot of serviceable life left in them and need a linear system to direct them. If only a minor fix is required on a master tape about to be shipped, there is still a call for an alternative that does not require everything to be digitized before it can be worked on. In this day of chasing the latest digital fad, it is good to see one company is smart enough to think inside the box. **BE**

L.T. Martin is a freelance writer and post-production consultant.

My production.
My NEC flat-panel displays.

Get the most from your digital IT infrastructure with the industry-leading technologies and support of NEC Display Solutions. Transitioning from a CRT-based environment doesn't have to be complex. Count on NEC for display expertise, proven solutions and the right LCDs for your critical control room applications. The NEC MultiSync® Large-Screen LCD Series and Professional Series feature a range of screen sizes, exceptional scaling, superior color accuracy and black level adjustment. Our Professional Series even includes digital CableComp™ for no-hassle long-cable runs, a 12-bit LUT for better color gradations and ColorComp™ for consistent white uniformity levels. What's more, you'll soon be able to upgrade the Large-Screen Series to SDI for even more cost-effective versatility.

Yet another way we're working to be your display solutions partner. Learn more at www.necdisplay.com or call 866-NEC-MORE.



NEC

NEC Display Solutions

MultiSync is a registered trademark, and CableComp and ColorComp are trademarks of NEC Display Solutions of America, Inc. © 2006 NEC Display Solutions, Inc. All rights reserved. Simulated images in monitors.



HD MONITORING

Miranda Kaleido-Alto-HD

Multi-image display processor with advanced video and audio probing, including signal black freeze, illegal luminance and audio presence detectors, overload, mono and out-of-phase alarms; reports can be on-screen or via SNMP to other devices.

973-683-0800; www.miranda.com



HD VIDEO PLAYER

Doremi Nugget

Plays HD and SD video files up to 80Mb/s, more than four times the HDTV broadcast standard's bit rate; new features include Gigabit Ethernet for faster file transfers; a logo generator that superimposes a 20 x 20 pixel image on the video stream; and a fixed latency and chase for multi-unit synchronization; available in a hot-swap pullout drive configuration.

818-562-1101; www.doremilabs.com



WAVEFORM, VECTOR AND AUDIO MONITOR

Hamlet Flexiscope

A multiformat, multi-standard handheld waveform, vector, audio, picture monitor; the line now includes two portable base units: the standard Flexiscope and the Micro, as well as the Monitor Scope MS9000.

+44 1494 729728; www.hamlet.co.uk

TECHNOLOGY SEMINAR

Cameras

BY BARRY BRAVERMAN

Let's think back in time, way back to the halcyon days of NAB2005. Affordable HD was all the rage and coming on strong, specifically HDV. This substantially compressed long-GOP DV variant was loudly touted to shooters as "high-definition image acquisition for the rest of us." At NAB2006, the HDV juggernaut continued to assert itself, of course, especially in the more capable models

At NAB2006, one thing was apparent: We broadcast shooters of the world are the mainstream now. On the other hand, maybe we always were.

Moving upmarket

Looking at HD from a prosumer perspective, JVC introduced the next iteration of its GY-HD100U. Moving clearly upmarket, the com-

At NAB2006, one thing was apparent: We broadcast shooters of the world are the mainstream now.

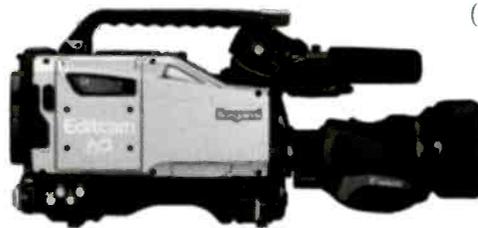
pany released the GY-HD200U and GY-HD250U models with 60p capability. The HD250U also sports broadcast features, such as HD-SDI with embedded audio, time-code synchronization and genlock.

from JVC. But in general, HD, from a broadcast shooter's perspective, reflected a new dynamic. The transformed HD landscape featured the former cinema-oriented wundergear of past years — the Thomson Grass Valley Vipers, Panasonic VariCams and Sony F900s — recast as new products with increased relevance and accessibility for broadcast shooters and profes-

Canon initiated the movement to HD-SDI in its XL H1 model introduced last November. This marked the first time that on-board uncompressed HD output was offered in a modestly priced, small-format HD (actually HDV) camcorder

— and the company continued to tout the camera's HD-SDI feature at this year's show. As many of us in the broadcast industry understand, HD-SDI opens up a plethora of switching and compositing options and signifies greater integration potential in low- to medium-sized studio facilities.

Speaking of facilities, HD integration into existing SD studio environments is facilitated in the JVC HD250U because the camera shares the same 26-pin connector used by the company's previous lineup of non-HD CCUs and related gear. This



Ikegami now offers the benefits of a 1000-line CMOS imager in its Editcam line.

Who could have envisioned that ENG shooters would warrant such consideration at this year's show?



bluefin

HIGH DENSITY SIGNAL PROCESSING

POWER AT YOUR FINGERTIPS



www.calrec.com

AUDIO MIXING FOR HD



Calrec Audio Ltd, Nutclough Mill, Hebden Bridge, West Yorkshire, HX7 8EZ, UK
Tel: +44 (0) 1422 842159
Email: enquiries@calrec.com





MASK FILTER/COMBINER
Jampro RCCC

A DVB-T/DTV mask filter/combiner designed to make the most of tight quarters; achieves excellent results in the band-pass and channel combing application; each unit is electronically and mechanically performance tested; space-saving ceiling mount is available.

916-383-1177; www.jampro.com



**PRODUCTION AND
PLAYOUT SERVER**
EVS XT2

Production and playout server for live production, post, content management and playout; servers can be combined to build a complete multichannel and real-time media sharing production network with nearline central storage.

973-575-7811; www.evs.tv

VIDEO SHARE PLATFORM
GlobeCast WING
Content Exchange

Allows video to be transferred, stored or streamed live for broadcast using any wired or wireless connection; the IP-based platform ensures stable and secure video file sharing; producers capture and upload video via any Internet connection to WING exchange servers that ingest, store and route content to the studio.

305-887-1600; www.globecast.com



BNC CONNECTORS
Canare BCP-PC Series

BNC connectors for SD-SDI; the 75Ω connectors feature a longer body, making them easier to grip; they also feature a three-piece crimp design that makes them effortless to assemble and field-replace; both the outer contact and the pin are gold-plated for long life and excellent transmission accuracy.

818-365-2446; www.canare.com

TECHNOLOGY SEMINAR

key compatibility obviates much of the hassle and expense one would normally associate with transitioning a facility into the HD realm.

The upmarket trend at JVC is reflected as well in the company's latest models featuring 60p image acquisition. The higher frame rate can often

broadcast markets. Sony, with respect to its ENG cameras, appears to be migrating to the smaller, more economical 1/2in camcorder models. This downsizing of the camera imager and higher compression of the MPEG-HD codec offers considerable price and weight advantages



At the Sony booth, *Broadcast Engineering* editorial director, Brad Dick (left), received a demonstration of the company's new HDV series of camcorders.

improve the look of an HD field recording as it provides much smoother motion for action news and sports events.

Filling the HD need

The mainstream HD movement at NAB2006 was also evident in Sony's new XDCAM HD models. Exhibiting many similarities to HDV, including a reduced 4:2:0 color space, the PDW-330 and PDW-350 models recognize the ENG and EFP shooters' need for a rugged image acquisition tool at a reasonable cost. For many, tapeless acquisition in HD will for many reasons swing towards Sony's blue-laser recorded disc. Therefore, the XDCAM models featured at this year's show could play a major role as the impetus for HD news and workflows takes hold.

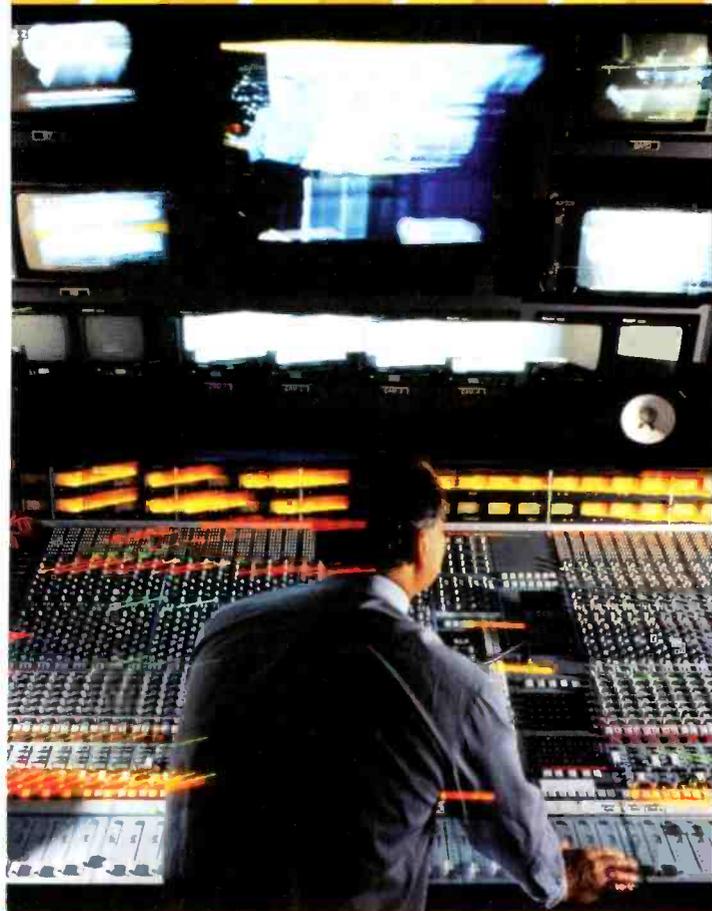
Sony's XDCAM HD models illustrate that HD cameras are transitioning to the more mainstream

over the company's top-level HD-CAM gear, which has been a favorite of EFP and long-form independent producers for years.



One of several new lenses introduced at NAB2006 for the Sony XDCAM HD line, the Fujinon XS13X3.3RM offers a wide angle and a built-in extender.

The smaller imager in the XDCAM HD models may have a less-than-favorable effect on depth of field, however, so maintaining appropriate selective focus with respect to background sharpness



WHAT KIND OF SIGNAL DO YOUR LABELS SEND?

RhinoPRO™ 5000 keeps your facility as professional as you are. Connections are everything. But marking them clearly and securely reflects a commitment to excellence you can share. Advanced RhinoPRO 5000 won't challenge your people. Instead, it will speed their efforts in studios, control rooms, OB vans – anywhere you need to identify and organize assets.

Easy operation keeps your operation moving. RhinoPRO 5000's full-featured command set includes one-touch "hot keys" and memory storage for instant labeling of cable ends, patch panels and stand-alone equipment. With back-lit display and impact-resistant rubber bumper, RhinoPRO 5000 is just as useful behind equipment racks.

RhinoPRO labels leave a lasting impression. Our easy-to-load, all-in-one cartridges hold easy-peel labels that resist heat, UV, moisture and smearing. Think of RhinoPRO 5000 as the latest labeling technology – to identify the fast-changing technology you provide and maintain.

Get RhinoPRO 5000 and get your labeling up to speed.

Visit www.rhinolabeling.com for details.

Available at Comprehensive, Gepco International and MilesTek

5000

Features:



- 1** RhinoPRO labels stick and stay stuck
- 2** Back-lit display for low-light environments
- 3** One-touch Hot Keys for cable/wire wraps, patch panels, terminal blocks, fixed length and vertical labels, eliminate guesswork and complicated menus
- 4** Separate save and recall keys for quick access to label memory
- 5** Durable rubber bumper for added protection





UHF IOT TRANSMITTER
Acrodyne (Ai) Quantum
Depressed Collector

A UHF IOT transmitter for 8-VSB and COFDM digital applications; features power levels up to 120kW average ATSC 8-VSB and DVB-T COFDM; plug-in technology and tube removal allow easy exchange of IOTs.

888-881-4447; www.acrodyne.com

AUDIO PROCESSING
SYSTEM
Junger Audio
LEVEL MAGIC

Uses an adaptive Level Control Algorithm to tame the transitions from one program source to another and looks after program peaks and average levels as well.

818-701-6201; www.junger-audio.com



HD EDITOR
Quantel eQ FX

An all-in configuration for broadcast and post applications; supports HD and multi-resolution post production; comes complete with 160 minutes of HD workspace, built-in TimeMagic no-wait hardware, and Qcolor in-context color grading package including Scene Detect; offers the latest Eiger 3.5 software and a choice of comprehensive plug-in packages.

+44 1635 48222; www.quantel.com

ATSC TRANSMITTER
Harris Platinum i

Complete with an integrated Harris eCDi enhanced network control and monitoring system in a PowerCD transmitter; allows the transmitter to be added to a TV station's modern network infrastructure, without the need for an external box; the cabinet also houses a Harris Apex exciter and transmitter control.

800-622-0022; www.broadcast.harris.com

TECHNOLOGY SEMINAR

could become more challenging for shooters. Nevertheless, I'm first to admit that many of my ENG brethren never give much thought to such cinematic notions as selective focus,

introduced. Both Fujinon and Canon announced new smaller-gauge objectives.

Fujinon showed a versatile 16X zoom equipped with a 4.6mm wide-



Panasonic highlighted several new cameras in their booth including the multi-format AJ-HDX900 HD camcorder. Recording at 100Mb/s, the HD images are captured in any of 11 video formats, covering both 60Hz and 50Hz platforms.

depth-of-field control and off-speed recording.

Speaking of which, the PDW-F350 allows off-speed recording from 4fps to 60fps, the effect of which can be played back in the camera's VF without the need for an external frame converter. Both new XDCAM HD models can record 1080i60, 1080i50, 1080p30, 1080p25 and 1080p24, so PAL standard-definition compatibility is assured. User

angle and built-in 2X extender. The company's 13X super-wide angle is designed specifically for the harried ENG shooter, who often shoots in cramped quarters like inside moving vehicles or ridiculously tight production trailers.

Joining the fray

Panasonic joined the rush to the HD mainstream with the introduction of the AJ-HDX900 camcorder,

Fujinon showed a versatile 16X zoom equipped with a 4.6mm wide-angle and built-in 2X extender.

selectable bit rates for HD recording range from 18Mb/s to 35Mb/s. At 18Mb/s, the camcorder can record more than two hours of HD (albeit with greater compression) on a single 23GB disc.

With the emergence of Sony's XDCAM HD models, a new lineup of 1/2in broadcast lenses was also

the heir apparent to the highly rented standard-definition SDX900 camera. The commercial-grade HDX900 camera is built like a tank, features the latest 2/3in imager, extreme low-light sensitivity and 24p recording.

This is a lot of camera at this price point, a clear effort by Panasonic to take control of the critical middle

Looking for the perfect fit?



The new VTM™ Series of multi-format test instruments — the final piece of the puzzle.

Processors

Introducing the world's first fully customizable, multi-format test and measurement console. The all new VTM™ Series contains standard features like waveform monitor, vectorscope, gamut, audio, picture monitor and the patented Q-See™ adjustable display. But, it's the unrivaled modular construction that empowers. *You* decide which options you want — and every piece is a perfect fit.

Routers

Servers

Editing

Graphics

Digital Signage

Test & Measurement

Monitoring & Control

Master Control & Branding

Management Software

Networking Equipment

TV & Radio Transmission Systems

H-Class™ Content Delivery Platform

CUSTOMIZABLE INPUT CONFIGURATION — HD/SD, SD, and Composite Analog input boards available. Monitor up to four input sources simultaneously.

VIDEO OPTIONS — Add features like Eye Pattern with Jitter meter.

AUDIO OPTIONS — Audio monitoring options featuring Dolby® decoding.

Create your solution today with the Videotek® VTM Series. www.broadcast.harris.com/videotek

Canada +1 800 387 0233 | USA +1 800 800 5719 | Latin America +1 305 512 0045

IOT
e2v Technologies
EEV ESCIOT

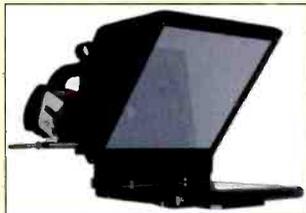
IOT is available as a three- or five-stage water-cooled design; uses an identical layout to that used on depressed collector klystrons; collector stages are cooled by deionized water, in series, via a set of interconnecting hoses designed to be long enough to eliminate the possibility of corrosion in a correctly operated cooling system.

914-592 6050
www.e2vtechnologies.com

UHF ANTENNA
Radio Frequency Systems
(RES) Superturnstile

An ultra-slim and lightweight superturnstile UHF broadcast antenna; supports all U.S. and European UHF bands (470MHz to 862MHz); exhibits pattern ripple of more than +/01.5dB across the entire UHF band; its low-drag profile underpins the antenna's high wind speed rating and low wind load characteristics; ideal medium-power DTV broadcast solution.

203-630-3311; www.rfsworld.com



TELEPROMPTER
Telescript

Mobile, wireless 8.4in LCD teleprompter is battery operated; has an adjustable slide-in tablet PC mount; can accommodate tablet PC screen sizes from 12in to 15in; weighs 9lb; has a brightness of 300 nits; mounts to all ENG and DV cameras; includes fold-and-go hardware with adjustable Spider Mount to accommodate 8.4in to 15in tablet PCs, and a sliding mount assembly.

201-767-6733; www.telescript.com



PRODUCTION SWITCHER
Ross Video Synergy MD/X

Multi-definition production switcher; supports SD at 525 and 625 and HD at 720P, 1080i and 1080psf with 50Hz, 59.94Hz and 24fps rates; MD WARP engine adds curvilinear effects to the Squeeze & Tease 3-D DVE.

613-652-4886; www.rossvideo.com

TECHNOLOGY SEMINAR

ground by usurping many technological advances of its higher-level VariCam models. The HDX900 does not include the adjustable frame rate capabilities of the much pricier AJ-HDC27H, but the look of the new camera's pictures — if the company's current HDX400 is any indicator — will likely be groundbreaking.

Of course, the AG-HVX200 bandwagon just keeps on rolling with tens of thousands of units reportedly shipped and many more still on backorder. In the mainstream ENG space, the company introduced the AJ-HPC2000, its first P2-based HD camera with five P2 slots and FireWire/USB 2.0 outputs. The ruggedness of the recording system,

beginning of a long, creative, data management process. The Infinity looks to be the best indicator yet of the inexorable trend towards a more IT-based workflow. The camera is positioned in the thick of the competition price-wise. And its open design places it optimally for ENG, EFP or literally whatever creative space you aspire to work in.

Hail the mainstream HD shooter

Across the spectrum of camera manufacturers at this year's show, the concerted push into the broadcast HD mainstream was evident and will surely yield enormous dividends for shooters. For years, camera manufacturers seemed more

These developments in imager technology hold major promise for all of us who slave away daily in the industry trenches.

having no moving parts, makes P2 attractive for ENG and EFP shooters who are prone to operating in perilous or extreme atmospheric conditions.

Going mainstream

The push into the HD mainstream for broadcast shooters is perhaps best illustrated in the open-source Thomson Grass Valley Infinity camera. The absence of a proprietary image capture and recording media gives shooters enormous flexibility for optimal integration into any station or production facility's workflow.

The camera is built around Grass Valley's high-end Viper and advanced JPEG 2000 compression scheme (the same codec used in Digital Cinema). The Infinity embraces the industry's established I/O protocols, including Gigabit Ethernet, MXF, FireWire and recording to standard Flash memory or readily available Iomega drives.

As shooters in the burgeoning HD mainstream, we must remember our image acquisition tools are only the

concerned about appealing to the low-end prosumer, designing and building inexpensive gear that lacked robustness and brains. That changed at NAB2006, and we found such promising trends as Ikegami bringing the virtues of a 1000-line CMOS imager to its Editcam HD line.

These developments in imager technology hold major promise for all of us who slave away daily in the industry trenches. As more of us in the mainstream migrate to HD news and long-form programs, we can increasingly avail ourselves of the ever more capable and robust ENG and EFP cameras at reasonable price points.

We've got the tools now. We've got the power. Now let's go shoot HD! **BE**

Barry Braverman is a veteran cinematographer with more than 20 years experience in feature films, documentaries and music videos. He is currently serving as a digital media expert and consultant to major studios. His latest book, "Video Shooter," is available from CMP Books at www.cmpbooks.com.

Storage

BY MICHAEL GROTTICELLI

In the area of video storage, perhaps the most noteworthy development at this year's NAB convention was the fact that it marked the first show in 50 years that a new videotape format was not introduced. This paved the way for several new removable storage options that store video as data on hard drives, optical disk, or solid-state media and quickly load into a camera or an external player or recorder.

Next-generation, networked storage (either as NAS or SAN) was also prominent in the form of new enterprise-wide shared RAID storage systems and highly intelligent holographic storage.

Also noteworthy this year is that the major computer industry storage suppliers, such as HP, IBM, SGI and Sun Microsystems, are now working closely with broadcasters to build out their offline storage systems and get every-



Storage systems get smaller, faster and often, less expensive. Shown above is the Nexsan SATABeast storage array.

body at a station working on the same network. Some broadcasters seemed wary of them only five years ago.

Nearline storage systems — products that store content as it comes in to the facility and content that is prepared for distribution — are still the domain of such industry stalwarts as Avid (with its new ISIS family), Thomson Grass Valley (with its new K2 media server and client system), Harris (with its Leitch NEXIO server family) and Omneon (with the Spectrum media server and new MediaGrid system).

Broadcasters are recognizing the potential that file-based storage systems offer and are implementing them with increasing regularity. For

PRODUCTION TOOLS Dolby Media Producer

Suite of software DVD and HD mastering tools; includes Media Encoder, Media Decoder and Media Tools; provides content creators with comprehensive audio material capabilities for packaged media; tools support encoding and decoding of Dolby Digital, Dolby Digital Plus, Dolby TrueHD and LMP Lossless for HD DVD, Blu-ray Disc, and today's DVD video and DVD audio formats.

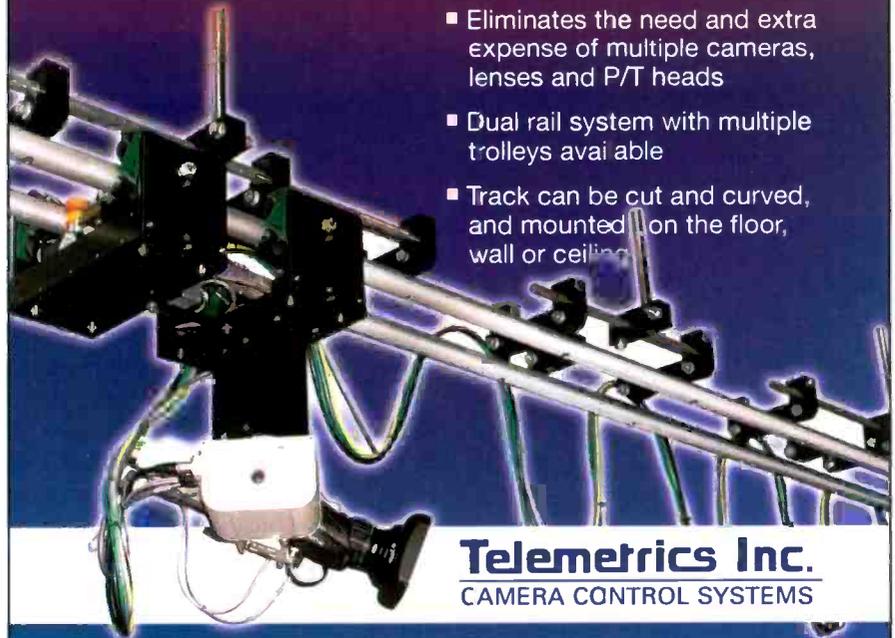
415-558-0200; www.dolby.com



get on the
right track

TeleGlide Camera Trolley System

- Smooth, quiet and fast camera trolley operation
- Eliminates the need and extra expense of multiple cameras, lenses and P/T heads
- Dual rail system with multiple trolleys available
- Track can be cut and curved, and mounted on the floor, wall or ceiling



Telemetrics Inc.
CAMERA CONTROL SYSTEMS

www.telemetricsinc.com



HD FIELD LENS
Fujinon XA66x9.3ESM

An ideal lens for sporting events and other large venues, it has a focal length range of 9.3mm to 615mm (x1) and 18.6mm to 1230mm (x2) and a MOD of 2.7m; offers a maximum aperture of 1:1.7 (9.3mm to 325mm) and 1:3.2 (615mm); measures 252mm x 252mm x 644mm; comes complete with digital controls, advance back focus and optional macro function.

976-633-5600
www.fujinonbroadcast.com



HD/SD MULTIFORMAT LCD MONITOR
TVLogic LVM-460W

A 46in multiformat LCD monitor; supports native full HD resolution (1920 x 1080); features wide viewing angles and the color accuracy of a professional video monitor.

+82 2 2025 8191; www.tvlogic.co.kr



STEREO DIGITAL AUDIO PROCESSOR
Linear Acoustic
AEROMAX-TV

Features CrowdControl, which provides control of two-channel main plus SAP audio, with front-panel display and controls plus Ethernet remote control; the four-channel unit can be configured as 2+2 or 2+1+1.

717-735-3611; www.linearacoustic.com

TECHNOLOGY SEMINAR

example, the CBS television network has contracted SAVVIS to deploy a digital media archiving and retrieval system supporting the entire network's content archives and its ap-

Line, which includes the SL500 and SL8500 tape systems, the 6920 mid-range disk system and NAS systems. Pappas Telecasting, a large, privately held, U.S. commercial television

Pappas Telecasting ... is installing a holographic storage system ... in its new automated master control facility in Reno, NV.

proximately 250,000 reels of content (and that number is expected to grow significantly over the next five years). The project includes implementing a digital archive, retrieval and distribution system for the CBS television entertainment library, which will allow the network to search, manage, store and repurpose assets.

broadcast group, is installing a holographic storage system from InPhase Technologies in its new automated master control facility for KAZR-TV and KREN-TV in Reno, NV. The InPhase Tapestry offers a 300GB write-once, read-many drive that enables broadcasters to record 35 hours of broadcast-quality video on a single disk with a transfer rate of 20MB/s in less than 4.5 hours. InPhase showed the system in the Maxell booth at NAB2006.



The right storage systems and network platforms for you are out there. NAB2006 offered attendees the chance to hunt down their ideal fit.

As another example typical of today's use of IT storage by broadcasters, FOX is using Sun Microsystems' Solaris 10 operating system for the network's new centralized sales, traffic and programming management system. With the Sun equipment — and Pilat Media's sales, traffic and program management software — FOX can monitor and manage the entire business process, from sales to billing, for all revenue streams. The IT server and storage project will be rolled out across all FOX television stations over the next three years.

Due to its acquisition of StorageTek, Sun showcased a hierarchical storage management solution based on the Sun StoreEdge and StorageTek Flex-

Other new options

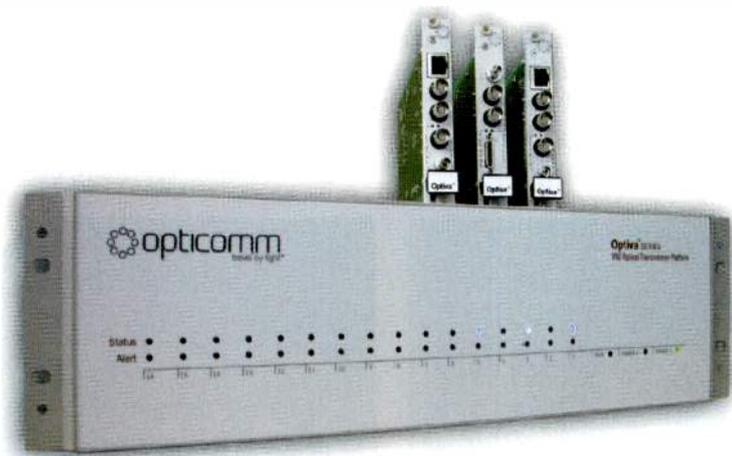
SGI displayed its new shared-storage solutions, which allow customers to create content via a collaborative workflow. The SGI Altix 4700 server is a 64-bit Linux system with a blade

design that allows users to configure any combination of blades, including Intel Itanium 2 processors, co-processors, memory, storage, I/O and graphics.

SGI's InfiniteStorage 6700, a 4Gb Fibre Channel storage system, provides 2.5GB/s throughput, while the SGI InfiniteStorage 10000 provides terabytes of storage arrays per square foot and fast retrieval of archived data at a price per terabyte that is comparable to a tape library, according to the company.

Omneon launched its new Media-Grid active storage system at NAB, which is also designed for multiple employees to simultaneously work with large digital media files within

**You Configure It.
We Build It.**



Optiva™ Configurable Fiber Optic Communication Systems From Opticomm

The Product Configurator lets you design a fiber optic transmission system to your precise needs. In one short visit you can select the exact signals you wish to transport, the optics and connectors you need, and the most suitable housing unit. You even get a comprehensive diagram of the system you created, all at the touch of a button.

The Optiva™ series of fiber optic systems are digital, laser-based multiplexers with optional combinations of various video, audio and data signals. Optiva™ systems utilize daisy-chain multiplexing to optimize bandwidth allocation. Anywhere from one to hundreds of channels can be transmitted over a single optical wavelength, where required.

All Optiva™ systems can be controlled and monitored using the SNMP-based OptivaView™ Network Management Suite.

All transmission is broadcast quality, without compromise.

Design your own system online at www.opticomm.com

Select from any of the following protocols to transport over multi-mode or single-mode fiber:

Video

Composite (NTSC/PAL/SECAM)

Studio Composite (NTSC/PAL/SECAM)
(12-Bit Processing)

SDI

HD-SDI

DVB-ASI

S-Video

Audio

Analog
(Balanced and Unbalanced)

Digital AES/EBU

Data

10/100 Ethernet

RS-232

RS-422

RS-485 (2 or 4 wire)

Contact Closure

See Opticomm's pre-configured systems for transmission of additional protocols. (such as VGA & DVI)


travel by light™

800.867.8426 | www.opticomm.com



24P CAMCORDER
Sony FDW-900R

Compact and lighter chassis; HD-SDI outputs and new accessory boards for slow shutter, image inversion and down-conversion with 3:2 pull-down; three 2.2 megapixel CCDs, 12-bit DSP, digital monitoring outputs; records four channels of AES/EBU digital audio plus four channels of simultaneous analog audio without the use of the HDCA-901 camera adapter.

800-686-7669

www.sony.com/professional

CRANE
Panther Broadcast
Pixy Crane

Weighs a light 69lb even at longest configuration; has a maximum length of 36.5ft; the maximum payload is 55lb; with a remote head, it can be easily carried and operated by one person; in shorter configurations, it can be used as a jib arm; its well-engineered anchoring construction assures maximum stability.

+49 89 613 900 01; www.panther.tv



PEDESTAL
Shotoku TP-90

Compact three-stage, minimum-height pedestal has a column stroke reach of 37.2in and a payload of 132lb; is located under the carriage; cable guards can be height-adjusted by turning a knob located at the side of carriage; safety features include a new and improved column lock as well as a brake ring placed within reach of the cameraman.

866-746-8658; www.shotoku.tv

TECHNOLOGY SEMINAR

broadcast and production facilities. The system combines grid storage and grid computing through the use of multiple intelligent, interconnected-yet-independent storage servers.

The main components of the system are ContentDirectors and ContentServers. ContentDirectors act as the overall file system controllers, managing the distribution of data throughout the system and providing data maps for easy retrieval of media.

The MediaGrid architecture uses a

specifically enhanced for professional video and is "MXF-aware." This enables VTR-like access to clips by time code along with metadata.

Each 300GB-capacity tape cartridge is designed to hold more than six hours of HD content (recorded at 100Mb/s) and carries its own file system directory. Each tape cassette also allows direct drag-and-drop access by applications on a network without the need for other software. With built-in Gigabit Ethernet capability, the SDLT



IBM's Digital Media Center provides broadcasters with a pool of shared storage for broadcast production that is not dependent on any specific technology or vendor.

file segmentation scheme that employs file slices as the unit of storage, instead of the traditional blocks used by conventional data storage systems. Every file is divided into slices, which are stored in multiple locations across the ContentServers. Redundant ContentDirectors manage the distribution of slices and maintain the database of slice locations.

Quantum showed its new SDLT 600A professional video drive, a data tape drive and NAS system that's spe-

600A is also network-attached, permitting direct access by every workstation and server on the network.

IBM demonstrated its Digital Media Center storage solution at NAB, showing how stations can use it to reduce cost and improve operations. The system allows real-time access to incoming video and the seamless sharing of content among users. It also enables content to be accessed by multiple clients as soon as the first bytes of content are recorded on



Fujinon's New 16X.
A wide angle...



and 16X Zoom
all in one lens!

- 16X zoom range
- 6.3mm wide angle
- 2X extender
- 0.4 meter close focusing
- Digi Power servo

DIGI POWER

FUJINON

HD
DIGITAL



FUJINON
FUJIFILM

Broadcast and Communications Products Division

FUJINON INC. 10 High Point Dr., Wayne, NJ 07470-7434 Phone: (973) 633-5600, FAX: (973) 633-5216

FUJINON CORPORATION 1-324 Uelake, Kita-Ku, Saitama City, Saitama 331-9624 Japan Phone: 81-48-668-2152

www.fujinon.com



REMOTE LIVESHOT SYSTEM

Media 3 BureauCam

Remote system has an intuitive touch-screen interface, interactive help screens and user prompts; features robotic camera positioning and shot control system, and an integrated camera control unit.

212-983-5200; www.liveshots.com



CAMERA-BACK TRANSMITTER Nucomm CamPac 2

Transmitter has on-board triple-pass MPEG-2 encoding; can upgrade to MPEG-4/H.264; is available in the 1.99GHz to 2.7GHz and 6.4GHz to 7.1GHz bands; operates with DVB-T compliant modulation in 6MHz, 7MHz and 8MHz channels; supports COFDM operation in channel bandwidths from 4MHz to 24MHz; RF output power is programmable from 10mW to 200mW; accepts a variety of video formats.

908-852-3700; www.nucomm.com

TECHNOLOGY SEMINAR

the disk, as well as simultaneous real-time read and write of files.

Principal storage components of the Digital Media Center include the DS6000 and DS8000 storage systems. These redundant arrays work in tandem with the TotalStorage Enterprise Storage Server, pSeries servers, the xSeries servers, General Parallel File

worked platform to fit every need. The challenge is finding the "bandwidth" to research which one is right for you.

New removable media for acquisition

At NAB2006 the industry began to see the tapeless future in earnest. With all of these new recording formats —

Clearly, this year's NAB proved that there's a single storage system or networked platform to fit every need.

System; the IBM Tivoli Storage Manager (which helps protect data integrity); and the LTO Ultrium tape drive.

Along with its ISIS system, Avid showed its new VideoRAID product line, offering 5TB of storage with guaranteed real-time access for multistream SD and HD content. Both the VideoRAID RTR320 and RTR320X are designed for use with Avid's NLE systems and are the first in a series of low-cost parity RAID storage products that the company is introducing as a result of its acquisition of Medea last January.

Clearly, this year's NAB proved that there's a single storage system or net-

work unlike videotape — a variety of frame rates and compression schemes can be stored on the same media.

The price of solid-state storage has begun to come down, resulting in reduced prices for Panasonic DVCPRO P2 cards, which cost half of what they did last year. The secure digital memory cards provide approximately 35 minutes of DVCPRO 50 recording on a 4GB PCMCIA card, and a variety of frame rates can be stored on a single P2 card.

Professionals continue to embrace Sony's XDCAM optical discs. The same Professional Disc media used in the SD version of the XDCAM

The question isn't why we're offering no-fee support. The question is, why isn't everybody else?

When our customers talk, we listen.

So when they said, "We love your automation software, but we don't want to pay extra for support," we said, "Okay."

They said, "Really? Why doesn't everyone treat us this well?"

"That," we said, "is a good question."

■ Announcing Crispin 4 Life.

No-fee 24/7 support for your automation software.



Automation just got easier.

Let's talk about you: welisten@crispincorp.com 919-845-7744 www.crispincorp.com

system is also compatible with the new HD version. Users can record up to two hours of HD content on a single 23.3GB optical disc, with a data transfer rate of 72Mb/s per optical head.

The Thomson Grass Valley REV PRO cartridge (manufactured by Iomega) was introduced to the United States this year. The new IT-immersed media is offered as part of the new Infinity series camcorder and digital media player. It combines the portability and cost-effectiveness of videotape with the speed, flexibility and ease of use of nonlinear, random access media. The product line also offers solid-state (SanDisk) and USB storage.

Along with its existing 80GB FieldPak2, Ikegami introduced a 120GB FieldPak (removable hard drive) for its HDN-X10 EditcamHD and standard definition DNS-33W Editcam3 camcorders. The 120GB FieldPak records 90 minutes of 145Mb/s HD video or nine hours of 25Mb/s SD video. The FieldPak weighs less than 9oz. The company also announced a 16GB RAMPak solid-state Flash memory that holds more than 70 minutes of DV25 video.

Finally, Hitachi introduced new solid-state Mediapac cartridges for its Z-DR1 dockable digital recorder in 8GB and 16GB versions and also showed a prototype 160GB hard disk storage drive. Hitachi's Z-DR1 recorder, introduced last year, was developed in partnership with nNo-via and Audavi to provide an affordable field acquisition system. The Mediapacs are aluminum-encased Hitachi hard disks, ranging between 40GB and 120GB capacities, offering up to nine hours of recording time per disk. An optional accessory for Mediapacs incorporates hardware encryption for secure content transport from camera to the intended destination.

BE

Michael Grotticelli regularly reports on the professional video and broadcast technology industries.

THE AZDEN 1000 BROADCAST PERFORMANCE, UNIQUE INTEGRATED UHF RECEIVERS

Whether you use the Anton-Bauer Gold Mount®, a v-mount battery, or have a Panasonic or Ikegami camera which takes a "slot-in" receiver, there's an Azden 1000 designed specifically for your use, giving you broadcast performance with no additional batteries needed.



Gold Mount
1000URX/AB



IDX "V" Mount
1000URX/VM



1000URX-Si
"Slot-In"

Features include:

- 121 UHF channels (723-735MHz) user-selectable, with LCD readout
- True diversity system with 2 complete front-ends and high-gain antennas
- Proprietary DLC (Diversity Logic Control) circuitry for reduced dropouts
- State-of-the-art dielectric filters throughout, for improved image rejection and superior diversity isolation
- High 5th order filters for improved S/N ratio
- Multi-function LCD shows channel number and frequency, battery info, AF level, and diversity operation
- Ultra small, lightweight, switchable, Earphone-out w/level control



Bodypack transmitter (1000BT) with reduced current-drain for improved battery life, is available with Azden EX-503H, Sony ECM-44H.

Plug-in XLR transmitter (1000XT) works with dynamic mics.

AZDEN

P.O. Box 10, Franklin Square, NY 11010 • (516) 328-7500 • FAX: (516) 328-7506
E-Mail: azdenus@azdencorp.com Web site: www.azdencorp.com

VIDEOCASSETTE

Maxell HDCAM

Videocassette uses binder systems to achieve durability and exceed the compulsory storage performance demands of long-term archiving; incorporates superfine ceramic armor metal particles (0.1 micron size) to surpass the low-noise requirements of HDCAM's 7-to-1 compression algorithm; lineup includes 6-, 12-, 22-, 32- and 40-minute cassettes; large cassette lineup includes tapes that run 34-, 64-, 94- and 124 minutes.

800-533-2836; www.maxell-usa.com



MULTI-IMAGE DISPLAY

Zandar Technologies FusionPro+

A signal monitoring system supporting all common formats, including composite video, SDI, HD-SDI, as well as RGBHV and DVI computer sources and audio; is highly modular with a range of plug-in interface cards enabling users to combine formats in one system; includes support for UMDs, tallies, clocks and time code; also includes video, audio and system fault detection, alarms and optional dual redundant power supplies.

321-939-0457; www.zandar.com

CONVERTER

Communications Specialties Scan Do HD

Converts DVI input at resolutions up to 1600 x 1200 to HD or SD-SDI output providing broadcast-quality video images; supports all SMPTE HD, NTSC and PAL output resolutions up to 1080i.

631-273-0404; www.commspecial.com

TECHNOLOGY SEMINAR

TM&M

BY PHILIP J. CIANCI

As I searched the NAB show room floor for the latest in test, measurement and monitoring (TM&M) equipment, I was especially interested in equipment that applied IT technologies in the broadcast environment. Unfortunately, I was disappointed in this respect. However, there were plenty of new TM&M products to excite any video engineer.

Subjective analysis

Pushing the evaluation envelope, Snell & Wilcox introduced Hyperion, a content monitoring system that uses intuitive algorithms to mimic human intelligence and therefore provide dedicated audio, video and metadata monitoring for television content as it passes through a facility. A broadcaster determines and sets what "normal" looks like for a given content type. If the content does not match up to the expected behavior, the system alerts the operator.

Content can be stamped with either SMPTE UMIDs or in-house IDs during ingest and linked to the facility's automation system. At transmission, these unique content identifiers in the playout schedule can be cross-checked with the IDs that have been stamped in the content, at both local and remote monitoring points.

Hyperion functionality is embedded in all new Snell & Wilcox infrastructure products. The system can be integrated with the RollCall, RollMap and RollSNMP broadcast control and monitoring systems, as well as third-party systems.

Video-quality measurement

A new generation of MPEG video analysis systems can verify the validity of compressed files on servers. Tektronix's Cerify performs compliance testing of file-based video and

audio against the encoding standards of all video from QCIF to SD, 720p and 1080i and for MPEG-2, MPEG-4, H.264, VC-1 and 3GPP for encoding errors. When a media file generates an alarm, Cerify reports the results and quarantines the



NAB2006 attendees showed an upbeat persona as they toured more than 1400 booths and exhibits. The good times are back.

file for further investigation. Video thumbnails allow the user to browse and drill down into content to determine the exact source of the errors.

It checks compliance and correctness to video and audio standards, video formats, resolutions, bit rates and video and audio quality. Users can prioritize the tests and base them on user-defined templates.

IT for broadcast

Notable for incorporation of IT

Unlock Your Imagination

FOR.A[®]
INNOVATIONS IN VIDEO
and AUDIO TECHNOLOGY



Imagination to Creation

www.for-a.com

Introducing the low cost addition to the Hanabi family of switchers:
The HVS-500HS multi-format HD/SD switcher.

HVS-500HS "1M/E HANABI Portable" **NEW**

This versatile new switcher can handle everything from editing and in-house studio applications to outside broadcasts and live productions. The main chassis and control panel have been combined into a compact self-contained unit, making it ideal for small trucks and fly packs. But, best of all, the surprising low cost of the HVS-500HS makes it an easy choice for multi-format productions.

- Functional in HD and SD format modes
- Analog and SDI input/output options can be selected
 - Analog component/RGBs (PC)/composite I/O board
 - HD/SD SDI I/O board
- Up to 8 HD/SD SDI inputs are possible; up to 12 total inputs possible
- PGM/PVW/AUX output available
- One DSK comes standard, and one keyer is available as an option
- Optional up conversion and frame synchronization card



FOR-A Company Limited / Head Office (Japan): Tel: +81 (0)3-3446-3936
USA (CA, NY, FL) / FOR-A Corporation of America: Tel: +1 714-894-3311
CANADA (Toronto) / FOR-A Corporation of Canada: Tel: +1 416-977-0343

UK (London) / FOR-A UK Limited: Tel: +44 (0)20-8391-7979
ITALY (Milan) / FOR-A Italia S.r.l.: Tel: +39 02-254-3635/6
KOREA (Seoul) / FOR-A Corporation of Korea: Tel: +82 (0)2-2637-0761

VIDEO TRANSPORT SYSTEM

Streambox SBT3-7500

Transport system is built on Streambox's ACT-L3 codec; is integrated in one portable device; features a low-power requirement; matches MPEG-2 video quality at a 75 percent lower data rate; is up to 50 percent more efficient than MPEG-4.

206-956-0544; www.streambox.com

MULTI-IP

Crispin Multi-IP

Architecture allows facilities to float management of channels between various control rooms located anywhere on an IP network; each control room can be dynamically assigned channels on an as-needed basis depending on the event and number of regional feeds required; channel controls can be assigned to an off-site location.

919-845-7744; www.crispincorp.com



AUDIO WIRELESS TRANSMITTERS

Lectrosonics SM

"Super Mini" transmitter delivers 107dB signal-to-noise ratio and flat frequency response to 20kHz; in native Digital Hybrid Wireless mode technology, both 24-bit digital audio and analog FM signal transmission methods can be used to encode a digital signal into an analog format for transmission over a UHF FM carrier; receiver captures the signal and DSP circuitry recreates the original digital audio.

505-892-4501; www.lectrosonics.com

VIDEO PRODUCTION SYSTEM

Solid State Logic MediaWAN

Provides a complete, scalable broadcast production system using proprietary software running on standard high-performance PCs and servers; software-encoders can import video from a variety of formats, including HD, while providing a preview and job allocation interface for production coordinators, editing software for journalists and management tools for news producers; an asset management database and user interface also provide for seamless information lifecycle management in the video domain.

212-315-1111; www.solidstatelogic.com

TECHNOLOGY SEMINAR

technologies in broadcast equipment, JDSU Acterna continues to develop broadcast applications for its network test and monitoring systems. In particular, the QT-1100 digital video service monitor analyzes MPEG transport streams carried over IP GigE networks, as well as traditional ASI, QPSK, QAM, 8-VSB and COFDM broadcast formats. Sta-

monitoring station products.

MaxView from ILC can either monitor and control individual resources or accept data from SNMP or other monitoring systems. This can cover an entire facility from ingest to playout, coordinating alarms with root cause analysis.

FBBT's Matador SNMP system offers the usual hierarchical system



The DVStation-IP from Pixelmetrix is a standalone MPEG-2 test and monitoring platform. All the broadcast services within a program transport stream IP connection are shown in a single, consolidated view.

tus is reported via SNMP aggregated information from all probes.

IPTV is a hot topic, and naturally many TM&M vendors are offering new IPTV features. Pixelmetrix has just launched the DVStor-IP, a hard-disk-based system that allows nonstop simultaneous recording of multiple channels of transmitted IP video. DVStation-IP is a standalone MPEG-2 test and monitoring platform that displays all of the broadcast services within a single program transport stream IP connection in a single consolidated view.

Sencore now offers a complete MPEG-over-IP stimulus and analysis solution. By combining the MIP 1664, an MPEG-over-IP generator, with the MIP1860, an MPEG-over-IP cross layer analyzer, broadcasters can fully test and evaluate IP-based infrastructures and equipment.

SNMP

With the continued integration of IT network capabilities in broadcast equipment, finding an SNMP system that can monitor both IT and traditional broadcast equipment has been elusive. Harris, Miranda and Evertz have each enhanced the functionality of their facility monitoring applications. And two new vendors in this arena, ILC and FBFT, provide manager-of-managers systems that integrate SNMP, GPI and other health signaling protocols into their central

topology view and a user-selectable "wiring" view that shows systems interconnects in a schematic fashion. Matador received a *Broadcast Engineering* Pick Hit Award this year.

Metadata analysis

As tape disappears, metadata is becoming the only way to manage content. Hence, the compliance of metadata with industry standards, such as AAF, MXF and V-ISAN, promotes interoperability between content management systems and helps ensure that you will find the content you need when you are looking for it.

Metaglugue has taken a step in this direction with its MXFixer software, a tool that extracts the essence and metadata from an MXF file, examines the metadata, checks it against known requirements and reports "OK," "Caution" or "Not passable." The full descriptive and structural metadata, media objects, metadata tree and KLV structure can be displayed. Tests can be programmed by the user to check MXF files for integrity against specific requirements.

AC-3 and Dolby-E metadata analysis has been added to Wohler's AMP2-E8 Dolby E decoder and monitor. Dialnorm, dynamic range and other metadata are monitored, and the decoder sends this information over a network connection to a PC application for analysis.

UTAH-400

It Just Keeps Getting Better...and Better

The UTAH-400 High-Density Digital Routing Switcher, already the world's most advanced switcher, now offers even more:



Automatic crosspoint redundancy in all matrix sizes
The UTAH-400 allows you to protect your critical signal paths against interruption with *AUTOMATIC* internal redundancy.

Three Frame Sizes -- 64x64, 144x144, and 288x288
You can use the UTAH-400 for any digital router application from the smallest utility router to the largest central matrix.

In any size, all UTAH-400 systems offer the same set of world-class features -- and the industry's lowest prices:

- Full time Input / Output Signal Monitoring
- Reduced Power Consumption and Rack Space Requirements
- SD/HD Compatibility
- Fiber Optic I/O Option



US UTAH SCIENTIFIC

New Directions in Digital Switching

4750 Wiley Post Way, Suite 150, Salt Lake City, UT 84116 USA
Ph: 801.575.8801 • Fax: 801.537.3099 • Email: sales@utahscientific.com

INTERCOM SYSTEM
Clear-Com Eclipse-Median

A mid-size intercom system; combines matrix platform and interface frame to meet the confined space demands of OB vehicles or mobile flight cases; features up to 112 ports, interfaces for fiber, phone and four-wire connections; dual CPU and PSU redundancy; supports most Matrix+3 and 4000 stations and interfaces.

510-496-6600; www.clearcom.com

TECHNICAL WORKFLOW MANAGEMENT SYSTEM
OBOR Digital Zeus

An integrated physical asset and technical workflow management system; provides full control of business models and processes; fits any size organization; role-based modular solution features include physical asset tracking, bar code integration, location management, wireless access, contact management, document management, scheduling system and custom user-GUIs.

407-352-6501; www.obordigital.com

LCD MONITOR
NEC MultiSync 90-series

IPS technology-based modules deliver unparalleled color reproduction, contrast levels, grey-to-grey response time and brightness uniformity by minimizing off-angle color shift and by producing black tones in dark-colored images; includes 12-bit lookup table and four-year warranty.

866-632-6673; www.necdisplay.com



HIGH-DENSITY AUDIO SYSTEM
Calrec Bluefin

Doubles the processing power of the latest Calrec Alpha console without an increase in cost; enables full EQ and dynamics to all channels; allows for 8 x 5.1 groups with full EQ and dynamics; 4x main outputs, 48 multitrack outputs and 20 auxes.

+44 01422 842159; www.calrec.com

TECHNOLOGY SEMINAR

Lip-sync

In the digital facility, lip-sync has become such a significant concern that the ATSC has issued a guideline for synchronization of audio and video. Now, we have the first generation of lip-sync analyzers to help monitor the problem.

Pixel Instrument's LipTracker measures video errors by comparing selected sounds to mouth shapes. Analysis of these events produces a direct measurement of lip-sync errors. SMPTE 292/259 and SMPTE 276M audio inputs are supported.

DK-Technologies' solution is the PT8612 HD-SD test signal generator, a new option for the PT5300 HD-SD VariTime sync generator. It provides a test pattern to check lip-sync. The test pattern is based on the EBU Tech 3305 standard and extends to all common HD formats, including 1080 and 720 lines progressive,

Color legalization

Compositing graphics and conversion between HD and SD can sometimes create illegal colors that produce display and modulation problems. Using an automated correction system is a good way to prevent this from happening.

Harris introduced the DL-860 HD/SD serial digital legalizer. The DL-860 output format tracks the input format, and the signal can be legalized to HD, SD, RGB and/or encoded color space. CRC values are monitored and recalculated to ensure proper output values. The DL-860 has a selection to pass or blank all ancillary data without any alteration except CRC correction. All limits are variable, allowing for custom configurations to the HD clips, SD clips, encoded gamut and RGB gamut limits. All operational parameters are also supported via Ethernet using the



Tektronix demonstrated a wide range of TM&M solutions. Two new products include the WFM6100 and the WFM7100 series, providing all new troubleshooting and monitoring abilities for multiformat video.

frame rates of 24Hz, 25Hz, 29.97Hz, 30Hz, 50Hz, 59.94Hz and 60Hz.

Besides the lip-sync test pattern, which contains moving elements to detect frozen pictures, the generator also provides common test signals, such as color bars, monitor test signals, PLUGE and SDI check field. The test signals may be superimposed with text for identification and contain an embedded audio signal.

embedded Web server interface. The DL-860 also supports the Leitch CCS Navigator control and monitoring software and the NUCLEUS user-customizable control panel.

Traditional monitoring

In traditional lines of TM&M equipment, I found several interesting solutions. RF is here to stay, so we better pay attention to the signal that

It's What's Inside That Counts!



MT4400
HPA



MT3400
HPA



MT3300
HPA



MCL's outdoor HPAs, offered in C-, X-, Ku- and DBS-Band, are now available with Integrated MITEQ L-Band Input Block Upconverter Modules, with optional 10 MHz internal or external frequency reference.

MITEQ offers a full line of separate BUC modules for C-, X-, Ku-, DBS-, Ka- and Multi-Band applications, in addition to our Outdoor Antenna Mountable Block Up- and Downconverter Solutions.

Visit us at www.miteq.com



&



For additional information, please contact the MCL Sales Department.

501 S. Woodcreek Road, Bolingbrook, IL 60440-4999
(630) 759-9500 • FAX: (630) 759-5018 • sales@mcl.com

www.mcl.com

Worldwide Communication Solutions!



KVM SWITCHING

Avocent AMWworks

KVM enhancement now supports Avid products, including Avid NewsCutter and Media composer Adrenaline, Symphony Nitris and DS Nitris finishing; user defined groups of outputs; supports up to 31 server outputs in a server group and 31 slave displays in a group.

866-286-2368; www.avocent.com

NETWORK MANAGEMENT SYSTEM

ILC MaxView 5.0

Consolidates all network management into one worldview; works in tandem with existing NMS deployments; allows for the direct assimilation of all network devices into the system; automatic topology discovery and display; root cause analysis based on user's scenarios; customizable user interface and advanced user management control.

404-504-7400; www.ilc.com

AUDIO ANALYZER

Rohde & Schwarz UP 300/350

Covers 10Hz to 80kHz with dual-channel analog inputs and outputs; sampling rates from 32kHz to 192kHz; generates single- and dual-channel test signals, including sine wave, two-tone and noise waveforms; measurements include level, linear and nonlinear distortion and FFT.

410-910-7800

www.rohde-schwarz.com/usa

ON-DEMAND ADVERTISING

TANDBERG interactive advertising

Provides dynamic ad placement with advanced VOD capabilities and ITV functionality; supports all delivery platforms and ad formats and all consumer media devices; based on open interfaces, allows advertisements to be matched according to programming type, geography and demographic data.

678-812-6300; www.tandbergtv.com

TECHNOLOGY SEMINAR

goes out over the air. Burk Technology has enhanced its ARC transmitter remote control system with Lynx version 5.1 software and ARCPlus. Z Technology's DM1010 DTV measurement demodulator features a proprietary demodulator and measurement technology licensed by Tektronix.

Level Magic from Junger Audio implements an adaptive level control algorithm that can adjust multichannel surround-sound audio levels. The system helps maintain a consistent level for all format sources.

Triveni StreamScope introduced the MT-40 and RM-40 DTV real-time MPEG transport stream analyzers. The MT-40 is an end-to-end, MPEG-2/MPEG-4 transport stream monitoring and analysis system for DTV signals carried by broadcast, ca-

ory stick, so users can carry a complete monitoring suite in a pocket, giving any Windows computer with a suitable signal input port an automatic or objective monitoring device with waveform monitoring, vector scope and color gamut error logging and checking.

Versions are available for DV, HDV, SD and HD. The latter two are compatible with PC video capture cards. Because test results may be captured for later analysis, the VidScope-vx can be used to automatically process content, which arrives as a file over IP rather than as baseband video.

Camera calibration and alignment

In an effort to prevent garbage in and then garbage out, DSC Labs introduced two new camera alignment test

While IT vendors are increasing their presence at NAB, there is still a lack of genuine IT technology and system solutions at the show.

ble, satellite, IPTV or mobile networks. It supports QPSK, 64/256 QAM, ASI and GigE. It also handles video file inputs, has remote monitoring capabilities and analyzes IP routing. The RM-40 remotely monitors, measures, records and analyzes DTV streams to ensure their integrity, reliability and compliance with standards. Monitoring can be handled over SNMP.

The LV5800 multi-monitor platform from Leader auto detects and monitors HD and SD formats, including sampling and color formats. The system displays waveform, vector, five bar, picture and audio information. User settable error levels trigger alarms that make error log entries that are referenced to time code.

PC-based monitoring

NAB2006 saw the U.S. debut of the Hamlet HD and HDV VidScope-vx, test and measurement systems running entirely in software. They are supplied and run from a USB mem-

charts. The Billups VF/X is designed for special effects and features an 11-step grayscale and gradient. It also includes vector color chips with skin tones, resolution columns and saturated angled RGYB. The Cam Align FiddleHeads chart simplifies backfocus adjustment via a double spiral test pattern.

Next steps

While IT vendors are increasing their presence at NAB, there is still a lack of genuine IT technology and system solutions at the show. Maybe NAB could take a proactive position and promote increased IT vendor participation. There is a need to see the demonstration of integrated system solutions on the show floor as well as have a dedicated conference track discussing real-world IT issues for broadcasters.

BE

Philip J. Cianci has been in the TV business for 21 years and is currently writing a book about the transition to digital broadcasting.

ADC's Pro Patch™ video panels

have long been recognized as the leader in video patching. Panels are available in a wide variety of configurations for rack sizes, jack types, and color options. The PPI series panels are the ideal choice for demanding professional environments:

- Durable welded-steel frames prevent bent, cracked and broken ears
- Widest variety of jack types available including standard, midsize, and MUSA standard
- Exclusive snap-over designations keep cards and windows in place and make changes easier
- Durable molded ABS inserts prevent stripped screws and cracked inserts

Whether it's copper or fiber, ADC's audio, video and data products are built to provide unmatched performance and reliability, and all ADC products are backed by outstanding pre/post-sale engineering support as well as the industry's best warranty.

Contact us today and find out why ADC means "performance by design."



2x32 Midsize PPI Series Super Video Jack Panel

Call today for fast delivery!

performance
BY DESIGN

High-Performance Products
for Digital Broadcasting

For a free copy of ADC's 13th edition broadcast product catalog, call 1.800.366.3891 ext. 20000. Or visit adc.com/broadcast.



MANAGEMENT SOFTWARE

Dimetis OpenBroadcast

A management system for broadcast networks, regional sites or transmitters and DVB/ATSC multiplex centers; controls devices and elements from different managers; network components monitored and controlled via SNMP; easy and flexible configuration of all components and signals.

732-919-0400; www.cware.com

VIDEO GATEWAY

Controlware

T-VIPS connect

Provides a video gateway suite of products for real-time contribution and distribution of broadcast quality video over IP; uses 10-bit video and embedded audio and JPEG2000 compression; low 120ms encoding and decoding delay; receiver and transmitter require only 1RU.

732-919-0400; www.cware.com

TRIAx-TO-FIBER

CAMERA INTERFACE

Telecast Fiber Systems

Digital Cobra

Provides digital transmission of bidirectional RF signals; compatible with most triax cameras; supports all two-way communications between camera and base station, including component video, audio, intercom and data over a single fiber; transmission distance up to 30km.

508-754-4858; www.telecast-fiber.com

PRODUCTION PLATFORM

Thomson Grass Valley

Integrated K2 and EDIUS

Integrated NLE and storage platform eliminates transcoding; supports seamless media and file compatibility; allows for multiple editors such as EDIUS, Apple FCP; handles MPEG, IMX, DVCPRO and HD-MPEG natively.

800-547-8949; www.grassvalley.com

DIGITAL WORKFLOW

PLATFORM

Vfinity V-Business

Powerful and cost-effective software for total content management, archiving and publishing; provides flexible, browser-based, database-drive metadata classification system for the search and retrieval of media content; uses standard IT infrastructure; based on eight modules, each targeted at different tasks.

646-367-6500; www.vfinity.com

TECHNOLOGY SEMINAR

RF

BY DON MARKLEY

The emphasis was not on high power this year — at least not to the extent seen in the past. High power was still there with high-efficiency tube transmitters for both analog and digital systems. But the big interest seemed to be more in the low- and medium-power levels. In particular, several manufacturers were offering products for use in single-frequency networks.

Exciters

Axcera emphasized its new digital TV exciter, the Axciter. With its

Transmitters

Ai has been successful with its water-cooled tubes. Many of those units have been installed and are performing well, offering improved efficiency.

Larcam and Rohde & Schwarz both showed lower-power transmitters for either standalone DTV facilities or single-channel network use. The Larcam transmitters can be configured for either analog or digital use by the selection of the exciter. The units range from 10W to 200W.

Of course, the low power makes



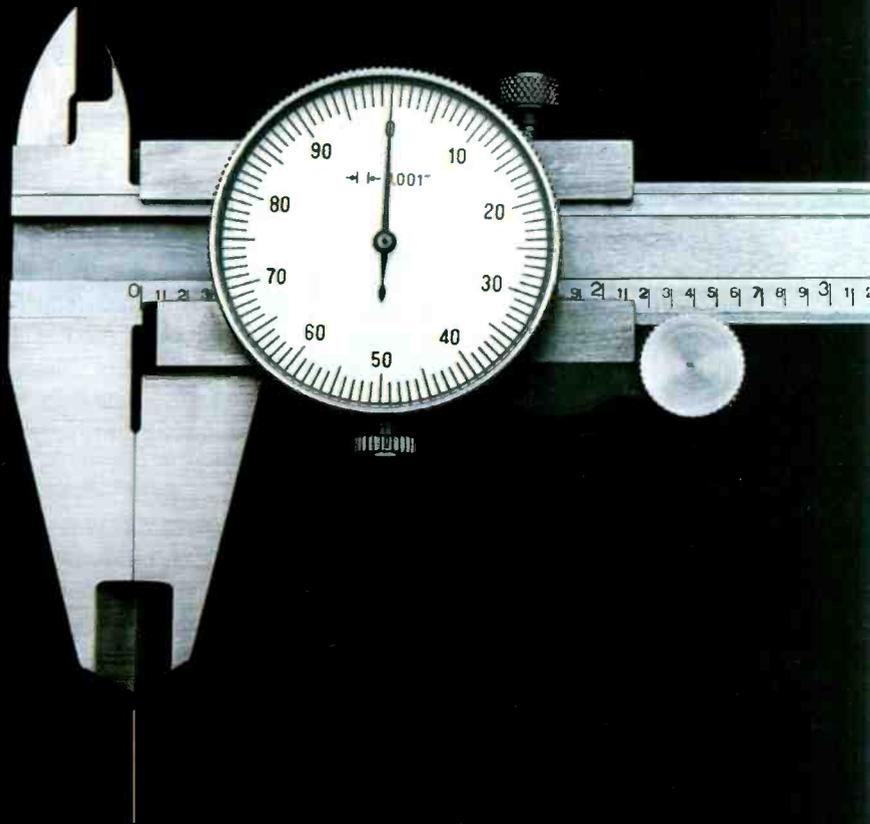
RF systems are still the broadcaster's last-mile solution. Shown above is the Japro booth.

companion upconverter unit, the Axciter provides an output signal on any television channel through selection on the front panel. The exciter is available with a complete digital signal analysis system.

The system software can be upgraded easily. The upgrade is simply loaded on a USB Flash drive, which is then plugged into one of the USB interfaces on the exciter. The new unit can also be used in the slave mode for single channel distributed transmission uses.

them good candidates for mobile video and for television translators. The construction of the company's FM translator is similar, with full frequency agility for both the receiver and transmitter.

The Rohde & Schwarz transmitters at low power also lend themselves to LPTV use or to the construction of single-channel networks. The company also showed its heavy involvement in the delivery of content to mobile users with the QUALCOMM technology. The company is also



**THE DIFFERENCE
BETWEEN TOLERANCE
AND ZERO TOLERANCE**

AS PASSIONATE AS YOU ARE



TO LEARN MORE ABOUT THE DIFFERENCE OUR
SD, HD, AND AUDIO CONVERTERS CAN MAKE,
VISIT US AT WWW.AJA.COM.



DIGITAL AUDIO CONSOLE
Logitek Mosaic-TV

Router-based digital audio console; uses Logitek Audio Engine with full-featured router to handle analog and digital I/O; uses drop-in modules permitting users to configure consoles as needed; multiple frame sizes; 5.1 compatible operation; direct access of two master mix busses, four sub-mix busses from each feature module; on-board five-function dynamics processor and full-color LDC display screens on each module.

713-664-4470; www.logitekaudio.com



HD MPEG-2 ENCODER
DVEO Ncoder HD

A low-latency, HD MPEG-2 transport stream coder; easy to manage and reconfigure; compatible with all industry standards; NTSC and PAL operation; MPEG-2 4:2:2 or 4:2:0 compression at 15Mb/s to 100Mb/s; MPEG-1 layer-II audio encoding; HD-SDI input; DVB-ASI output.

858-613-1818; www.dveo.com



VIDEO LENS
Fujinon HA16x6.3ERM

A 2/3in HD ENG/EFP lens combines wide angle and high magnification; enables production crews to have the benefit of both close and telephoto lens in one package; minimum focal distance is 0.4m; includes DigiPower servo system for precise focusing.

976-633-5600

www.fujinonbroadcast.com

TECHNOLOGY SEMINAR

working with Samsung and demonstrated A-VSB technology.

Harris has also been working extensively with QUALCOMM, using MediaFLO for the delivery of multimedia content to mobile handsets. Toward that end, Harris

cluding systems for the relocation problems in the 2GHz band.

Every now and then something from the radio world seems to find use in television. Broadcast Electronics created the Big Pipe STL for HD radio, but it also provides a cost-ef-

A big area this year was development of microwave systems for either STL or intercity use.

showed its Atlas and Ranger Mobile TV transmitters, which use the Apex television exciter. Harris and Rohde & Schwarz showed complete lines of solid-state DTV transmitters at various medium-power levels.

ENG

A big area this year was the development of microwave systems for either STL or intercity use. MRC displayed continued development of HD and SD systems using IP interface types. Those systems support

fective link for television. The system has more than enough bandwidth and can use all the popular formats. It operates in the 5.3GHz band without a license or in the 5.8GHz band for longer paths.

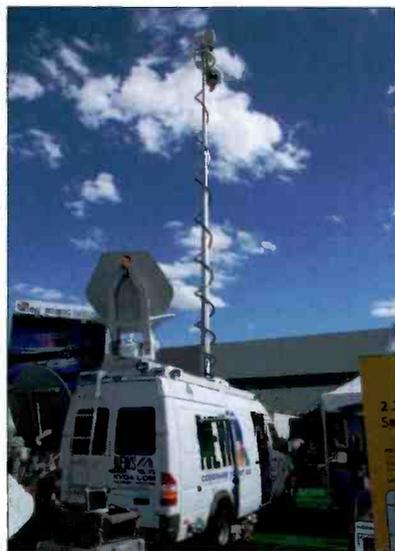
Antennas

Antennas were interesting this year. RFS' antennas are now manufactured in Australia, as are its filter products. At the show, the company emphasized its filters and manifold combiner systems.

Dielectric had several new antenna products to sell. Perhaps the most unique was a small broadband batwing for UHF frequencies. The unit is omnidirectional and is different because the batwing elements are cut out of a sheet of material. The entire unit is within a radome and can be mounted on a motorcycle or car as the radiator for an ENG system. The antenna also would serve well as a lower-power auxiliary, an LPTV antenna, in single-frequency networks or as a television translator.

Dielectric also displayed a UHF array with 30-channel bandwidth. The antenna is available in medium- or high-power versions. It is a slot-type antenna constructed on panels that can be removed for repairs if necessary. The slots are radome covered. The antenna is available in eight-through 30-bay configurations for gain and can be used for directional antenna purposes.

The previous Dielectric panel array has been modified by adding stainless



Local news is still the broadcaster's most potent tool in attracting audiences. Shown above is the news truck for KVOA-TV, Tucson, AZ.

real-time streaming or video-file transfer in non-real-time formats. The company showed new products for mobile systems. Nucomm also displayed new ENG technology, in-

The Power of an Eclipse

The new Eclipse family of matrices has been developed using the latest technology to provide broadcast professionals with the most advanced digital matrix intercom on the market. Common frames, panels, and interfaces across the range give flexibility and easy expandability as communication requirements grow.

- Powerful, redundant processing
- Individual level control
- Unsurpassed audio quality
- Rugged design



 **Clear-Com**

www.clearcom.com

© 2006 Vitec Group Communications

Americas and Asia:

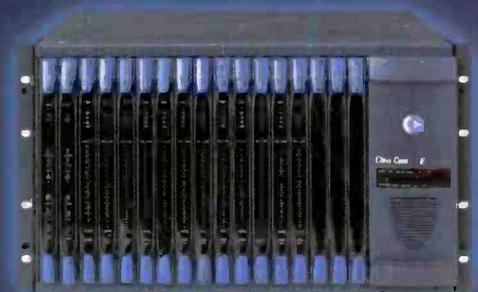
4065 Hollis Street • Emeryville, CA 94608

Tel: 510-496-6600 • Fax: 510-496-6699

Introducing...
Eclipse SOFT-Voice



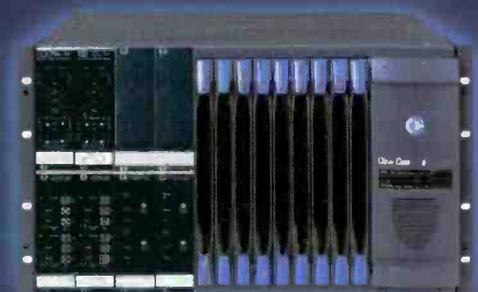
Eclipse Voice



Eclipse Omega



Eclipse PiCo



Eclipse Median

In Your Hand

DISTRIBUTION SYSTEM

Pathfire Direct

A point-to-point distribution solution providing easy integration and installation with capture and playout devices; flexible format options; interface designed for TV professionals; selectable signal or multiple receive destinations; uses MXF-compliant metadata; uses dynamic bandwidth use to optimize simultaneous encoding sessions.

770-619-0801; www.pathwire.com



VIDEO STORAGE

SGI InfiniteStorage 10000

A mass storage system designed to support large online storage requirements; up to 240TB in a signal rack; perfect for tiered storage architecture; uses dual-active 4Gb Fibre Channel controllers operating at greater than 2.5Gb/s; represents a 300 percent improvement in drive density per rack compared to standard RAID sub-systems.

650-933-6338; www.sgi.com

ROUTER CONTROL PANEL

Utah Scientific UCP-MN

A 16-input selector button panel, each with an eight-character LCD display that provides control; has four high-resolution LCD displays with touch-screen capabilities; panel can be configured for multi-bus or full-matrix control with direct access to pre-selected sources and destinations.

801-575-8801; www.utahscientific.com

VIDEO PROCESSOR

Kramer SP-10D

A broadcast-quality signal processing solution; includes proc amp, standards conversion, signal format conversion and time base correction in one package; accepts composite, Y/C, YUV, RGB or RGBS, and outputs all these formats simultaneously; converts signals to any video standard (NTSC, PAL, SECAM) with the output genlocked to an external video reference.

972-654-4000
www.kramerelectronics.com

TECHNOLOGY SEMINAR

steel backscreens and radiating elements. The TUA-M is a mid-power antenna primarily designed for multiplexed operation for digital and/or analog stations. The multiple panel approach allows for custom beam tilt and null fill applications. The individual panels are radome covered, or the entire antenna can be placed in a cylindrical radome for wind loading



Dielectric's mobile media antennas garnered attention from the QUALCOMM and DVB-H crowds.

New markets

A big issue in the RF arena this year was the obvious development of new markets for traditionally broadcast TV manufacturers. The transmitter companies were looking into lower-power operations for use in new technologies to provide data and video directly to handheld devices. Several were working with QUALCOMM in its new distribution system.

It is apparent that the big transmitter sales and antenna installation boom will soon take a major nose dive. Essentially, all TV stations will have installed new antennas and transmitter systems for digital television. With the exception of further maximization or new stations, the traditional TV market will be shrinking until the normal replacement cycle starts well on down the road.

On the other hand, the 700MHz areas and the 1.7GHz band are both buzzing with new applications and new services. The 700GHz areas are simply the high end of the old UHF broadcast band where a lot of experience exists in transmitters and antennas.

The new lower-power transmitters appeal directly to that market — as are many of the newer antenna systems. There is the growth of combiners to join several transmitters into a single antenna in either of those bands. The combiner companies see a large future demand for

purposes. In all, it is a nice modification of a proven existing product.

Electronics Research showed a new VHF batwing antenna. The antenna was different because it was not constructed on a pole. Instead, the antenna is supported by a square tower

A big issue in the RF arena this year was the obvious development of new markets for traditionally broadcast TV manufacturers.

section. All the necessary cables are run inside of the tower section instead of being fastened outside of a monopole. This provides better protection from ice, lightning and tower climbers. The routing of the lines inside the tower also allows better grounding with reduced damage from arcing.

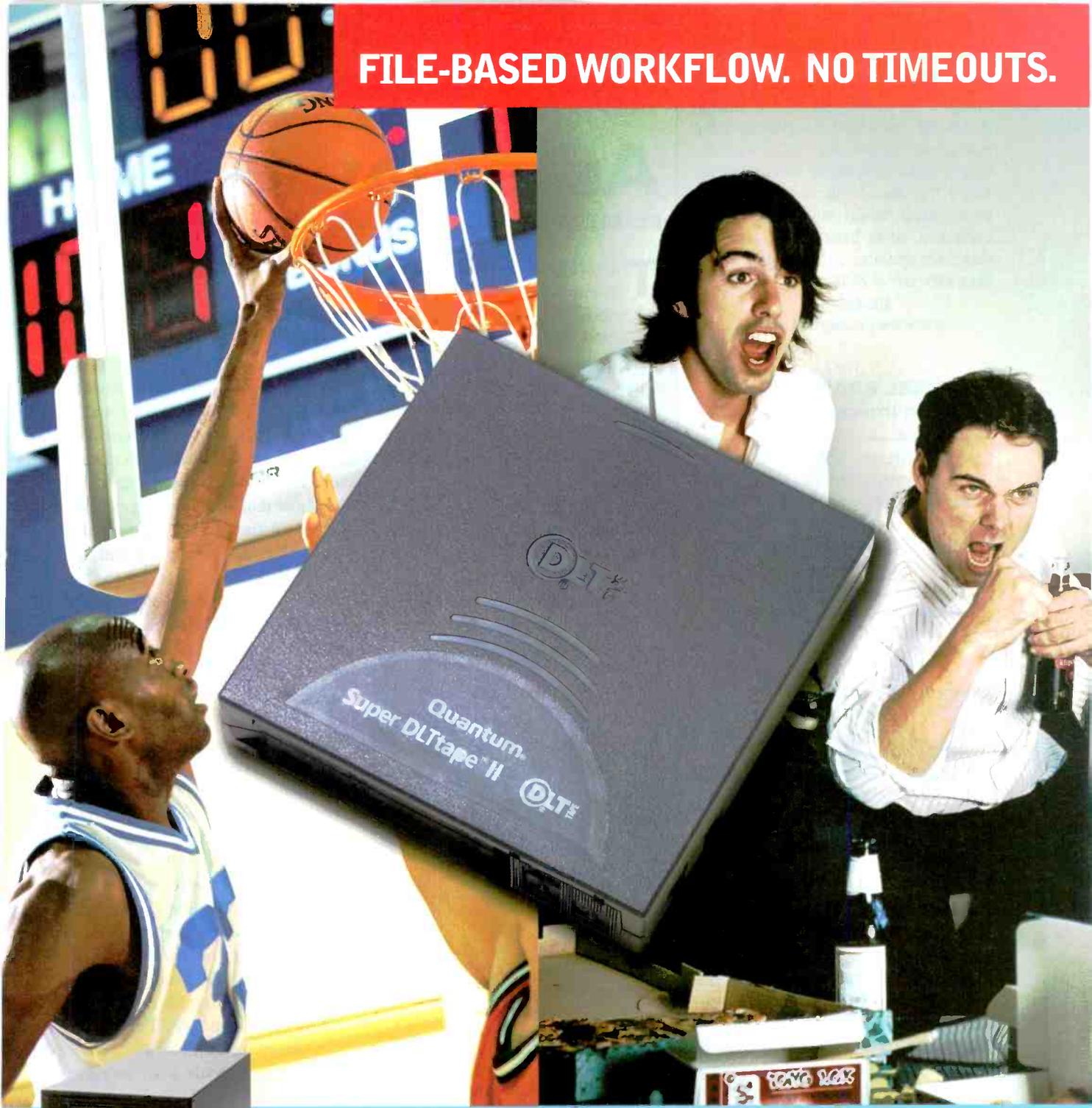
that product as do the antenna and transmitter manufacturers.

Just the tip of those developments was visible at this year's show, but it is certain that next year will reveal even more.

BE

Don Markley is president of D.L. Markley and Associates.

FILE-BASED WORKFLOW. NO TIMEOUTS.



With its directly accessible, network-attached, MXF-aware tape-based file system, the SDLT 600A for professional video helps you beat the buzzer every time.

Today, the name of the game in the broadcast and video industry is file-based workflow.

The Quantum SDLT 600A is your team's top pick to seamlessly integrate and automate your workflow — from ingest to archive. With MXF-aware performance that accesses valuable metadata, built-in Gigabit Ethernet and faster-than-real-time transfer rates of up to 288Mb/sec, the SDLT 600A will help you run the fast break to a pure digital workflow. To develop a game plan, get your free Guide to File-Based Workflow at www.quantum.com/tape4tapelessworld



Quantum

BACKUP. RECOVERY. ARCHIVE. IT'S WHAT WE DO.™

3X SLO MO CAMERA

Sony HDC-3300

Achieves 3X speed slow motion effects in full HD resolution; uses three 2/3in high-speed progressive CCDs; recordings at 1920 x 1080/180i or 150i as well as 1280 x 720/180p or 150p; in-camera functions include flicker reduction, shading correction, white balance and auto iris detection; operates on standard SMPTE fiber with runs of 2000ft.

800-686-7669

www.sony.com/professional

CHANNEL BRANDING

Miranda Imagestore

Intuition+

Can play out multiple video and audio clips and animations; advanced CG and multi-language support; co-processor can output full-frame or partial frame clips simultaneously; clips play with eight-channel audio (six-channels with SD version); fully compliant with Unicode fonts.

973-683-0800; www.miranda.com



PORTABLE DIGITAL STORAGE

Hitachi Mediapac

Available in 4GB, 8GB and 16GB solid-state cartridges; also available with 160GB hard disk storage support for the Z-DR1 dockable digital recorder; Mediapacs are aluminium-encased Hitachi hard disks, ranging between 40GB and 120GB capacity providing as much as nine hours of recording time per Mediapac.

516-682-4429; www.hitachikokusai.us

VIDEOTAPE DRIVE

Quantum SDLT 600A

A professional video drive supporting many file-based workflow solutions; supports network-attached storage that is MXF-aware; 300GB capacity cartridge holds more than six hours of HD 100Mb/s video; supports drag-and-drop access; uses Super DLTape II data tape.

408-944-4000; www.quantum.com

TECHNOLOGY SEMINAR

Automation

BY JIM BOSTON

The accelerating pace of change in our industry was reflected in the television automation realm at NAB2006. The consensus regarding business at this year's show was that things have improved over the past few years, maybe not in the number of visitors, but in the perceived quality of interest in automation solutions.

The merging of servers and automation persists. And the march continues toward the goal of a station in a box, as the adoption of IT to implement solutions in all areas of television expands. Several ven-

Data Exchange Working Group's implementation of the ATSC Programming Metadata Communications Protocol (PMCP), specified in ATSC document A/76.

Broadcasters intent on surviving, and even thriving, are looking for new opportunities to distribute content. NAB president and CEO David Rehr told broadcasters in a speech at the show that every new device and gadget on the market is a potential vehicle through which content can be disseminated. That means, of course, more channels of programming with existing resources. Rehr predicted that issues with business models, copyright and technology will "get worked out."

What's newly shippable?

Sundance Digital replaced FastBreak with FastBreak NXT. It is geared for one and four channels of control and incorporates a number of features from the company's flagship Titan product line.

FastBreak XPress replaces FastBreak Spot as the slimmed down version of the NXT product. Geared for facilities looking for basic server and switcher control, XPress offers basic machine control and allows for an easy upgrade path to either FastBreak NXT or Titan. FlexEvents now includes expanded control of secondary events by allowing users to create mini timelines of secondary events and attach these either to the playlist or as an attribute of the element itself.

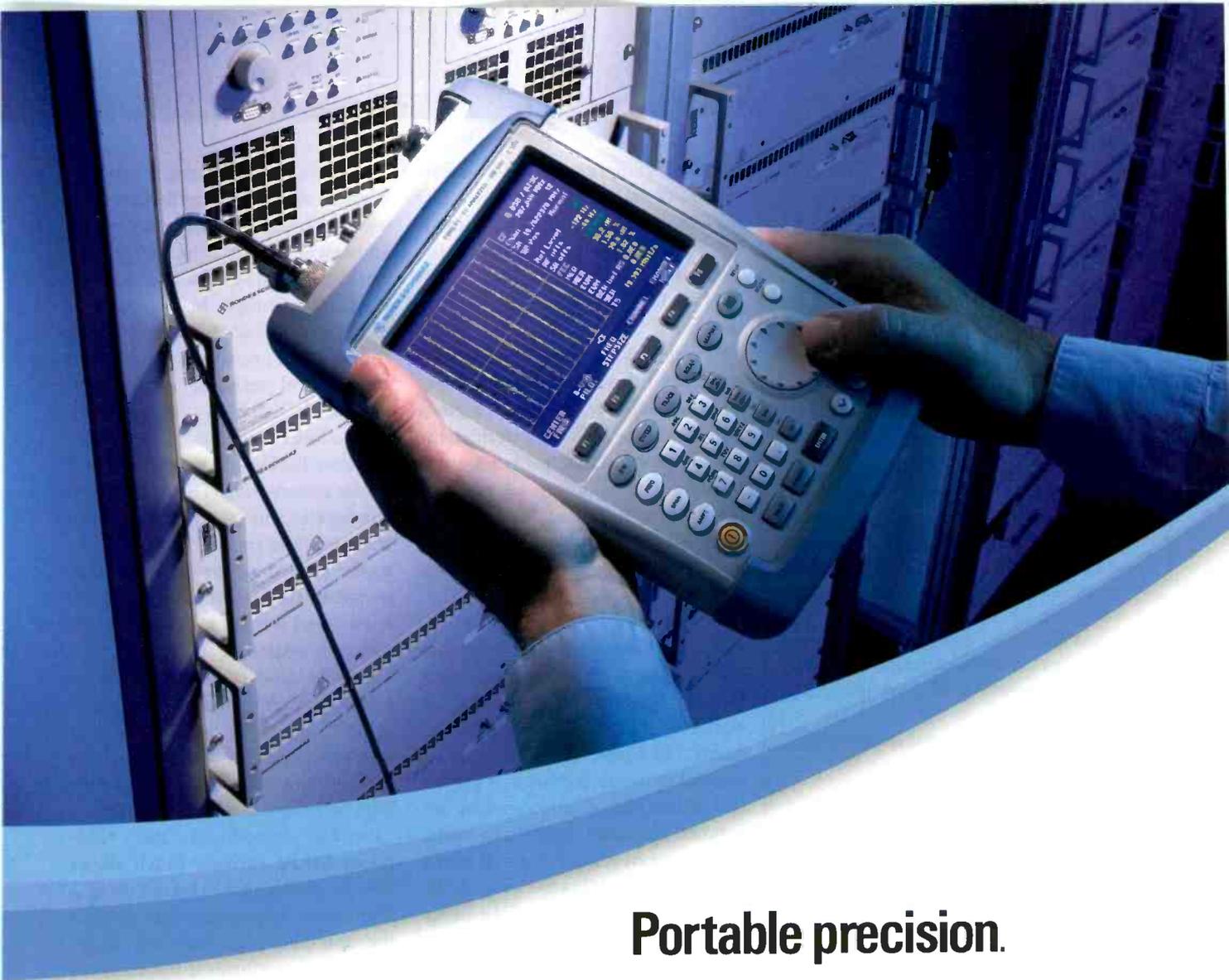
OmniBus showed iTX, which is based on the company's software and standard, off-the-shelf computer hardware for automation, server and master control. It runs using Microsoft Windows XP, 2003 Server, DirectShow and .NET; the AMD Opteron line of processors; and HP



Pro-Bel demonstrated the Morpheus automation system, which supports the payout of conventional content in addition to a wide range of multimedia and data-based material.

dors have incorporated automation into server hardware as part of their systems.

The systems have taken on such chores as transcoding between file formats, allowing for the seamless delivery of file-based content from end to end. This requires the management of a large amount of content and a wide range of formats. Tighter integration of graphics, automation and traffic systems is taking place with the completion of the SMPTE S22.10



Portable precision.

Outstanding TV measurement performance is finally available in a compact, portable package.

The unique new R&S®FHS3-TV gives you everything you need for broadcast and cable TV system field service measurements:

- Spectrum analysis to 3 GHz
- Digital TV measurement demodulator
- Software, pre-amplifier, and tracking generator
- Battery-powered field portability at just 6 pounds

The R&S®FHS3-TV supports analog and digital broadcast and digital cable standards used throughout the world. You get portable precision, at a very reasonable price. Contact us to find out more.



ROHDE & SCHWARZ

rohde-schwarz.com/USA • 1-888-837-8772

VIDEO ROUTER
PESA Cheetah 512XR

Can be configured to 512 x 512, non-expandable 1024 x 128 or 512 x 256 with fully redundant crosspoints in 27RU; low-power consumption; SDI, ASI and HD-SDI support; internal fiber I/Os and optional built-in conversion cards meet the standards of broadcasters, mobile production companies, cable and telcos.

631-912-3101; www.pesa.com

WEATHER RADAR
Baron Pulsar Radar

Solid-state, high-quality radar delivers sophisticated performance and increased storm detail; four-module solid state 250W C-band Doppler radar with pulse compression; provides high-definition data of 256 color levels and 3000 range bins — providing up to 10X higher resolution; SmartPower technology; steel EMI-shielded enclosure, fiber-optic communication lines.

256-881-8811; www.baronservices.com

CONTENT MONITORING SYSTEM

Snell & Wilcox Hyperion

Uses intuitive algorithms, which mimic human intelligence to provide dedicated audio, video and metadata monitoring for content from ingest to transmission; automatically provides an educated opinion to whether each element of a program meets satisfactory viewing quality standards; simplifies remote monitoring with powerful tools that use metadata to track and QC content.

818-556-2616; www.snellwilcox.com

INTERCOM SYSTEM
Riedel Artist

Matrices allow all frame sizes to use the same type of controller and client cards, which reduces expansion costs and the need for spare pooling; other enhanced features include increased memory for complex, multi-mode installations, optimized cooling concept for quiet operation and a flexible fiber option that enables users to easily change from multi-mode to single-mode or high-power.

+49 202 292 90; www.riedel.net

TECHNOLOGY SEMINAR

standard IT hardware. MCR effects capability via software includes 2-D DVE, CG and still-store functionality. When playlists are ingested, the associated media — be it MPEG, AVI WM or DV — is also ingested into the server.

NVerzion is offering NStat, which monitors Ethernet machine control and the company's NBase. NVerzion also introduced NLine, a multichannel application that provides users the ability to monitor all of their playlist schedules from one easy-to-read software interface. It also notifies the operator of any scheduling conflicts.

Harris released an enhanced D-Series playout automation solution that interfaces with its H-Class Content Delivery Platform for more efficient workflow in multichannel environments. The new H-Class Media Ingest features dynamic exchange of playlist and as-run data. It also provides automated file-based ingest from media delivery services with required transcoding and the ability to configure associated workflows, including proxy creation and audio normalization.

DTG's Xe automation system now includes transfer technology that automates and resolves Pathfire metadata. Xe's virtual metadata display technology provides information and alerts to browsers and to a Miranda Kaleido-K2 display showing the on-air event ID as well as warning messages. The system also has a DekoCast driver interface that allows an operator to specify a template file and insert text and information to automatically appear on-air.

Digital Broadcast MediaFire, a play-to-air server, now includes direct interfaces to such media delivery services as Pathfire, Fast Channel, DG Systems and Vyvx. Its MediaVault archiving system provides increased Blu-ray storage. The MediaBank Safety Net is a disaster recovery system that provides complete automated on-air functions off-site in the event the station is unable to maintain on-air operations.

Crispin's ArchiveManager provides nearline storage for media that is integrated into the automation system and can be used to help manage disk space on video servers. Crispin's Hierarchical Storage Management is incorporated into the system. This combination provides a policy-based storage and retrieval system. The company's Digital Transfer Agent provides a link between third-party content distribution and fully automated, on-air presentation. The transfer system locates and issues commands to transcode and transfer programming to the play-to-air server, along with metadata that is simultaneously retrieved and written to AssetBase, the company's database application.

AVECO showed ASTRA Lite, a simple 1RU PC server with one user station for ingest and playout of one on-air playlist and control of a 360 Systems server, a small router, logo inserter and a VTR for ingest.

Pro-Bel introduced the Morpheus Media Browse, which allows low-res copies to be created using a high-speed transcoder that streams the specified files from the material source, performs a transcode to Windows Media 9 format at twice real time and then stores it.

Pebble Beach System's Anemone is an entry-level automation system intended for small broadcast operations. It provides playout and ingest tools that can be used to run up to four channels.

Conclusion

Many segments of the industry are realigning their roles as to which systems are performing which roles in the television food chain. In a number of segments, the footprint of some gear has been reduced to the limits of required physical I/O for a box or system. So, if size can't be reduced, feature sets move and stretch across traditional boundaries, and vendors find that they have new competitors.



Jim Boston is a West Coast consultant.

**HD
DIGITAL**

CHECK IT OUT



HFO Camera Cable Checker

Compact and easy to use

Measures optic loss

Verifies electrical continuity

Features Canare HF connector design

Backlit LCD display for easy reading

Visit us on the web: www.canare.com

Check out all our Exciting New Products

- **New** Mid-size Video Jacks
- **Low Profile** SMPTE FO Cable
- **Expanded** Optical Links Line
- **Innovative** HDV HFO Converter
- **Low-cost** SD BNC Connectors

California: 531 5th Street, Unit A San Fernando, CA 91340
Tel: 818.365.2446 • Fax: 818.365.0479

New York: 60 E. 42nd Street, Suite 2306 NY, NY 10165
Tel: 212.682.9661 • Fax: 212.682.9480

Affordable, compact, Simple and Smart Solutions

CANARE

www.canare.com



BROADCAST RACK **APWMayville** **Stantron rack**

Enclosures for broadcast, audio and visual, data communications and telecommunications; available in a variety of heights and depths; flexible design with unmatched rack density; low profile, measuring 22in wide; durable powder coat finish and lifetime guarantee; available with twin profile power strips; cooling fans and filler panels.

800-558-7297; www.stantronracks.com

BRANDING SYSTEM **Chyron Channel Box**

An HD/SD switchable, turnkey branding system; features 3-D design and controllable layout for branding applications, including tickers, crawls, snipes, promos and end-of-show credits; comprehensive set of real-time video, graphic effects and audio capabilities; can be integrated with traffic and automation or be used as a standalone control device.

631-845-2133; www.chyron.com

TECHNOLOGY SEMINAR

Audio

BY TOM PATRICK MCAULIFFE

Be it general audio products, surround sound for video and television, or HD and digital audio post production, it was all on display at this year's NAB. New solutions — offering both higher quality at more effective price points and easier functionality — were in abundance. While exhibitors were enthusiastic, so were attendees looking for audio solutions, especially 5.1 surround-sound products. This being my fifth year covering the audio beat at NAB for *Broadcast Engineering*, I was anxious to see if any trends would emerge.

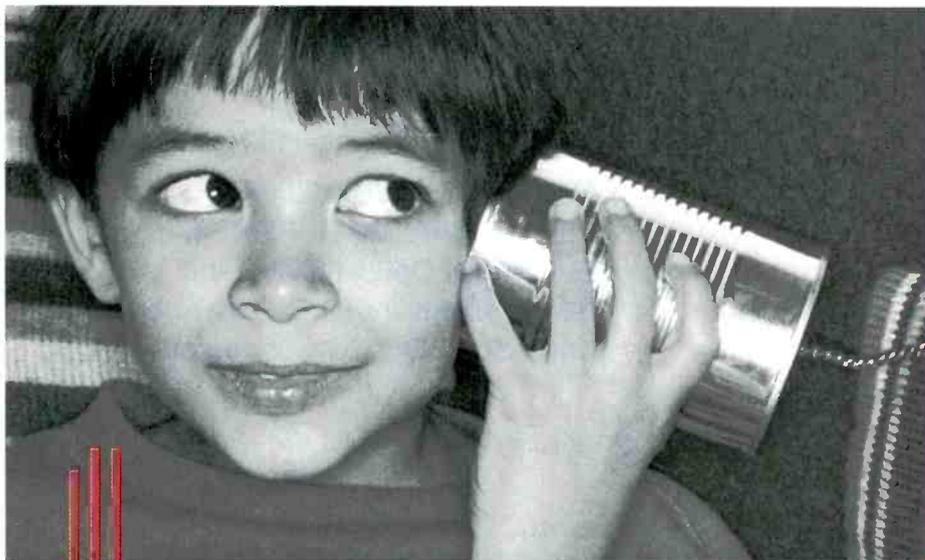
Viewers expect great audio to accompany their HDTV channels, and 5.1 audio will soon be a requirement for every digital broadcaster. Exhibitors said viewers are becoming less tolerant of excessive sound levels. Broadcasters are paying closer attention to perceived loudness and are asking for solutions to balance the divergent audio levels that often exist between drama and commercials. The last thing broadcasters want is for the viewer to find the difference in sound levels too great to tolerate

and then mute or change the channel. Fortunately, there were plenty of new audio solutions shown, with the trend being toward the smaller and less-expensive.

Microphones

The new H4 SuperMINI surround-sound mic from Holophone is a discrete 5.1-channel camera-mountable surround microphone that can encode surround audio directly to tape in real time. Sanken's COS-22 is a dual-capsule lavalier microphone. The ultra-miniature mic measures only 1.25in in length but has a full-frequency response of up to 20,000Hz. Neumann showed its new TLM 49 large diaphragm, cardioid, studio microphone. It features the K 47 capsule, which is used in the familiar M 49 and U 47 microphones.

This year's show also saw several other product trends, including increased automation and networking, as well as a better integration of software solutions. Surround mixers and software with built-in 5.1 support and higher 24-bit 196kHz resolution



RIEDEL
The Communications People

NEXT GENERATION INTERCOM

Curious how your studio, mobile or event installation can profit from our ARTIST Advanced Digital Intercom Matrix or our PERFORMER Digital Party-Line System?

Please visit our website
www.riedel.net

were also on display. For example, Euphonix showed its full line of broadcast and audio post consoles, including the new System 5-B and Max Air systems, which are specifically designed for on-air and live-to-tape applications. They include full integration with facility audio routers.

Euphonix digital audio mixing systems are now capable of fully integrating with most router control systems that use the ES-Switch protocol. Those vendors include NVISION, PESA, Pro-Bel, Sony, Thomson Grass Valley and Utah Scientific. The company's new System 5-P audio post system and the new System 5-MC integrated DAW audio mixing system offer networked control of other ap-



Microphones were a hot item as broadcasters looked for 5.1 broadcast and recording solutions.

plications, including Pro Tools, Logic Pro and Digital Performer via the HUI control protocol. Euphonix and Hitachi Data Systems also have teamed up to offer a new audio facility network server, which made its debut at NAB.

Recorders

Digital audio recorders of all shapes and sizes were available. The new Marantz Professional PMD560 is rack-mountable and records to Compact Flash or microdrives. It is capable of onboard editing, complete with instant audio access to the preset marked points. The unit provides more than 35 hours of recording time on a cost-effective 1GB Flash memory card.

Online

As more broadcasters move to repurpose content, many are interested in improving the online audio experience for viewers. An Orban and Coding Technologies partnership offered a free MPEG-4 aacPlus Audio (also known as HE-AAC) player for Windows Media users. Via a DirectShow Plug-in, the new audio software technology enables the more than 80 million users of Microsoft Windows Media to enjoy near-CD-quality audio at only 32Kb/s.

With the trend toward HD, the challenge for the broadcast and video industry with 5.1 continues to be providing more content that's compatible with the wide variety of consumer playback technologies.

BE

Tom Patrick McAuliffe is a journalist, video creator and former member of the U.S. Navy's Combat Camera Group.

Broadcasters Trust Telecast Fiber for ALL their Fiber Optic Needs.



ADDER and ADDER II

Whether you need analog audio, AES, intercom or even A-D and D-A signal conversion, there is an Adder system ready to handle any audio challenge. Up to 256 channels per fiber, at 24-bit resolution, with optical redundancy for quiet, reliable sound.



SHED/HDX and COBRA

For Triax and hybrid cabled cameras, we have solutions to liberate you from your heavy copper. SHEDs eliminate your costly hybrid cables on HD cameras, while Cobras replace triax on HD or SD camera systems...with ten times the distance.



VIPER I / SIDEWINDER

For 14 years the Viper and Sidewinder have supported ENG/SNG applications around the globe. The reel-mounted Sidewinder and Viper Mussel Shell are immediately familiar as the workhorse systems that have proven themselves in the most extreme conditions...day in and day out.



VIPER II

With small "throw down" modules that can be converted to rack mount, the Viper II is an expandable system that grows with your facility. Modules range from video/audio to Ethernet to robotic HD/POV, for incredible flexibility using simple building blocks.



COPPERHEAD HD/SDI

Our camera-mounted CopperHead makes light work of a wide range of applications, from news coverage to digital cinematography. Turn your ENG camera into a remote production camera, and avoid the cumbersome, expensive triax backs and base stations.



DIAMONDBACK II

Picking up where its predecessor left off, the DBII now offers 8 channels of broadcast-quality NTSC/PAL video on each wavelength. With optional audio and CWDM technology a huge backbone can be implemented on a single optical core.



Save time on your event production schedule. On a single lightweight cable we support all your broadcast signals from the field and the booth to the truck. From Telecast, the leader in fiber for television broadcast production.



Telecast
Fiber Systems, Inc.

(508) 754-4858

All products mentioned herein are trademarks of Telecast Fiber Systems

www.telecast-fiber.com

NETWORK MANAGEMENT SYSTEM

Harris NetBoss

A scalable solution that monitors and configures STL links through one graphical user interface; the cross-platform element management option supports distributed network architectures and provides complete, real-time management for the Harris Video Networking and Microwave Solution.

800-622-0022; www.broadcast.harris.com



NEWS EDITOR

Quantel Newsbox HD

Complete news system; affordable, convenient and self-contained; arrives with all that is needed to ingest, view rushes, choose shots, edit stories, review finished pieces and play them to air; available in both HD and SD and HD-upgradeable configurations.

+44 1635 48222; www.quantel.com

AUTOMATION SOFTWARE

OmniBus iTX

Replaces all the functions of a broadcast MCR and playout chain with a single software application; ideal for both SD and HD playout; uses standard IT hardware; acts as a video server, master control and graphics and logo inserter with automation, ingest, editing and basic content management; integrates with video or IT storage to manage files.

303-237-4868; www.omnibus.tv

MEDIA SERVER

Omneon Spectrum MediaDirector

Higher bandwidth addition to family of MediaDirector components for Spectrum systems; provides twice the overall system bandwidth for higher channel counts and higher IP throughput; allows for more file-based movement of media for staging or collaborative production; increased Fibre Channel bandwidth for more simultaneous access to storage.

408-585-5000; www.omneon.com

TECHNOLOGY SEMINAR

ENG

BY PHIL KURZ

In all things, change is inevitable, but the pace at which electronic newsgathering technology is evolving is unprecedented — and, to a degree, unpredictable — for this corner of live television. At NAB2006, at least three significant technology trends emerged that are reshaping how news will be gathered and transmitted to the local station. They include:

- the ongoing work by Sprint Nextel to relocate broadcasters to 12MHz digital channels in the 2GHz band,
- the development of wireless cam-

crowave as the preferred method of backhaul, it is becoming apparent that today, the technology offers a powerful means to supplement traditional ENG and in the future, may play an even greater role.

2GHz relocation

The FCC-mandated Sept. 7, 2007, deadline for the conversion of ENG operations from analog to digital and relocation to 12MHz-wide channels between 2025MHz and 2110MHz weighed heavily on the minds of



Frontline had ENG and remote trucks filled with new gear at the show. Everything the crew needs to originate a live shot or pre-produce a feed is within the operator's reach.

era transmitters capable of supporting high-definition news and, sports acquisition in the field, and

- the transmogrification of video from a signal to a digital file, allowing video to play in the IP space with all the advantages of the Internet.

It's become clear that this treatment of video as files, which can be sent via FTP across wireless Internet broadband service, adds a pinch of unpredictability to the ENG recipe. While few would argue that in the near term IP file transfer will replace traditional point-to-point mi-

many at NAB2006. It appears the FCC, Sprint and the industry could not foresee the obstacles currently impeding relocation progress. Many on the show floor questioned whether the 31.5 months allotted for the relocation would be sufficient. However, Sprint is sticking to its assessment that the job will be completed on time.

Failure to hit the deadline won't be the fault of microwave equipment vendors. At least two, including RF Central, showed photographs of shelves at their facilities chocked full



2GHz DELAY CORRECTED IFB

When you convert to **2GHz**
there will be an audio delay between
the ENG truck and the studio.

We have the **tools to remedy**
your IFB delay.



12A World's Fair Drive, Somerset, NJ 08873
Toll Free: (800) 826-2603 · Fax: (732) 302-0206
E-mail: sales@modsci.com · Web: www.modsci.com



HDV CAMERA
JVC GY-HD200U

Captures at HDV720/60P with JVC's new Super Encoder developed for the latest line of ProHD products; provides 60 fps capture and over-cranked recording for slow motion when the final output is 24P; uses all of the accessories currently available for the GY-HD100U, including the new 1/3in mount HD lenses.

800-582-5825; <http://pro.jvc.com>



HD PROCESSOR
TV One C2-7300

Multiformat, dual channel HD video processor with HD-SDI multichannel audio processing; supports virtually every bidirectional analog-to-HDTV conversion all within a compact 1RU enclosure.

800-721-4044; www.tvone.com

P2 HD STATION
Panasonic J-HPS1500

Recorder and player bridges between SD and HD production environments; acts as ingest, transfer or up- and downconversion station; IEEE-1394a (AVC) and USB2.0 interfaces as well as HD-SDI and SD-SDI input and outputs; works seamlessly in DVCPRO HD tape-based systems for transferring, editing or playout; records in 1080i and 720p in DVCPRO HD, 50Mb/s in DVCPRO50, 25Mb/s in DVCPRO and 25Mb/s in DV.

800-528-8601

www.panasonic.com/broadcast

COAXIAL CABLE
Belden CDT Electronics
Division 1694F

New addition to the Brilliance line of professional video cables; is a super-flexible version of the 1694A Precision Video coax; both cables use the same connectors, eliminating the need for additional tooling and connectors.

765-983-5308; www.beldencdt.com

TECHNOLOGY SEMINAR

of new, compliant microwave radios and associated equipment ready to be rolled out once exchange agreements are reached between Sprint and the stations, groups and networks. The consensus on the floor identified several factors, including unanticipated layers of group and network management, an initial lack of understanding about the complexity of the task, complicated tax implications and cautious

processes to avoid being the last on the relocation boat.

HD wireless cameras

Fresh off its use at the West Asian Games in Doha, Qatar; the Winter Olympics in Torino, Italy; and Super Bowl XL in Detroit, the Link Research LinkHD wireless camera system made its second NAB appearance this year. Exhibited in the Micro-



Shook Mobile Technology came to NAB2006 with a Hummer-based ENG vehicle destined for RCG. NAB2006 was also the last trade show for company founder Ed Shook, who retired in May.

corporate legal counsel, as reasons for the unexpected delays.

Perhaps a harbinger of better news was an announcement from the ABC Owned Television Stations Group and Sprint just prior to the opening of NAB2006. The two have agreed to a template Frequency Relocation Agreement for each ABC-owned station and a Group Reimbursement Agreement covering the network's station group relocation-related expenses in the 2GHz relocation project.

Under the terms of the agreement, Sprint will pay for ABC's relocation-related expenses, including the acquisition of comparable equipment to operate in its new frequencies. One Sprint source expressed the hope that now that a large network has committed to a relocation agreement, other networks and station groups will accelerate their approval

wave Radio Communications (MRC) booth (both companies are owned by Vislink Communications), LinkHD L1403 delivered HD shots with only a 50-millisecond delay. The system uses the company's MPEG-2 encoder and a diversity reception system for reliability and performance.

LinkHD offers 1.95GHz to 2.7GHz or 3.40GHz to 3.58GHz operation and supports LMS-T and DVB-T modulation schemes and a variety of camera control options. LMS-T is an expansion of the standard DVB-T pedestal. It couples all of the advantages of COFDM with a single carrier using a widened channel bandwidth of 8MHz to deliver greater throughput.

At the Nucomm booth, the latest version of the CamPac made its NAB debut. The CamPac 2 COFDM SD/HD camera-back transmitter offers

You're focused on signal processing and infrastructure.



So are we. That's all we do.

Whether upgrading your broadcast facility to digital, or converting to HD, Avenue will take you there.

- **HD up/down/cross conversion**
- **HD/SD Dual rate modules**
- **New optical I/O**
- **Best control system plus SNMP**

InfoComm Booth 3764

ENSEMBLE

D E S I G N S

Tel +1 530.478.1830 ▲ Fax +1 530.478.1832
www.ensembledesigns.com ▲ info@ensembledesigns.com
PO Box 993 Grass Valley CA 95945 USA

**UP-, DOWN-,
CROSSCONVERTER**

**Ensemble Designs
Avenue 7900**

Capable of auto configuration; user selects the desired output format and the module self configures the remaining settings; allows broadcasters to set the output to the facility's standard format and feed a variety of inputs to the module, without concern for any other settings; audio sub module options offer Dolby E decoding and audio mixing.

530.478.1830

www.ensembledesigns.com



**ADVANCED MEMORY
SOFTWARE**

Broadcast Pix Scripts

New memory software for production switchers; takes advantage of the tight integration of the company's built-in graphics capability; software recalls key settings, as well as the exact clips, titles and animations to fill the keys; can be extended to control camera and lens positions and video servers; a single-button push can select a camera, position it, bring it to air, fade on its specific title and then fade it off.

781-221-2144; www.broadcastpix.com

HD CAMERA

Canon XL H1

A broadcast-quality, 1080i camera with 20X zoom lens; three 1/3in 16:9 interlaced CCDs; selectable frame rates of 60i, 30 and 24 frame; perfect for ENG, documentary or reality TV production; extensive cine controls; uncompressed digital HD-SDI output for seamless integration into broadcast studios or high-quality image transfer to NLE systems.

800-652-2666; www.usa.canon.com

TECHNOLOGY SEMINAR

user-selectable MPEG-2 encoding supporting a low latency mode down to two frames, as well as an IPB frame mode that delivers a 30 percent improvement in image quality. The "B" mode designates higher performance compression and typically is associated with rack-mounted encoders from companies, such as TANDBERG Television and Harmonic.

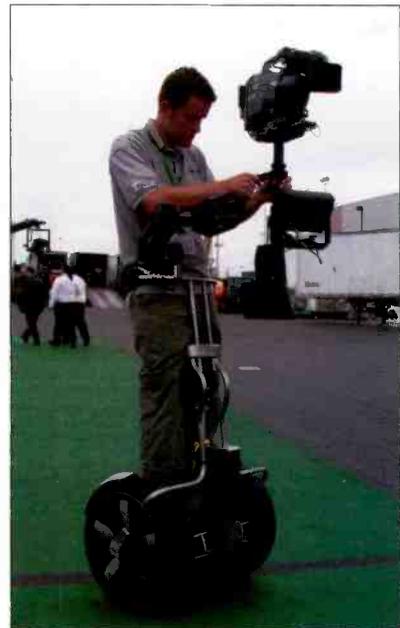
CamPac 2 delivered live HD shots at 34Mb/s from the back of the Las Vegas Convention Center Central Hall, where the NAB-HD studio was located all the way to Nucomm's booth in the front of the same hall. Nucomm's new Newscaster DR digital COFDM diversity SD/HD receiver was used to receive the live shots.

The Newscaster DR offers DVB-T compliance at 6MHz, 7MHz and 8MHz channels and provides variable IF bandwidth from 4MHz to 16MHz in the 1.99GHz to 2.7GHz bands and from 4MHz to 24MHz in the 6.4GHz to 7.1GHz bands. It's no coincidence the specs match those of the CamPac 2, which offers operation in the 1.99GHz to 2.7 GHz and 6.4GHz to 7.1GHz bands. The CamPac 2 operates with DVB-T-compliant modulation in 6MHz, 7MHz and 8MHz channels and also supports COFDM operation in channel bandwidths from 4MHz to 24MHz. While the CamPac 2 is due to ship in July, a prototype has been used for coverage of NBA basketball and the America's Cup race.

No stranger to high-profile HD coverage of sporting events, the RF Central RFX-HD-CMT camera-mounted system transmitted wireless high-definition video from around the Central Hall to a Global Microwave Systems Messenger Smart Receiver with a Sencore decoder in the company's booth. Used last season during the NFC playoff games, the RFX-HD-CMT supports MPEG-2 encoding and comes with dual COFDM carriers. Typically, RF Central would match the wireless camera transmitter with an RFX-RMR-X6, but for the sake of simplicity at the

show, the company used the GMS receiver.

The RFX-HD-CMT supports user-selectable 6MHz, 7MHz and 8MHz channels operating in 1GHz to 6Hz bands. Maximum RF output power is 200mW. The system can transmit a maximum range of between a quarter and half of a mile under typical operating conditions. However, in March, the company success-



In the outdoor ENG area, HandsFree Transporter's modified Segway turned quite a few heads as a camera-transport system for Steadi-Cam use.

fully linked a transmission from the RFX-HD-CMT through a helicopter a distance of 5mi.

Thomson Grass Valley also showed its new HD wireless camera system. The system is unique in that it uses JPEG2000 wavelet-based compression to deliver high compression efficiency and encoding latency in the one-frame range. The RF component of the new system uses a WiMax subset — 802.16 — to provide coverage of 3280ft with an optional roaming kit. Grass Valley's HD wireless camera system was designed to be used with the LDK 6000 series of high-definition cameras.

The fact that several vendors focused on HD wireless camera solutions at NAB2006 shouldn't be

ENTER TO WIN!

StudioENSEMBLE

TECHNOLOGY IN PERFECT HARMONY



ARIA 2000R Character Generator



AVITECH
MCC8004dE Multiviewer



OPERA 3408 Dual Format Switcher



IMAGE SERVER 2000

EVERYTHING YOU NEED FOR GREAT PRODUCTIONS
FINALLY, NOW YOU CAN AFFORD A SEAMLESSLY INTEGRATED STUDIO PRODUCTION SOLUTION

FREE INTEGRATION SOFTWARE VALUED AT \$10,000 WITH PURCHASE
THE WORLD'S "BEST OF BREED" COMPACT BROADCAST QUALITY PACKAGE

WIN THIS COMPLETE STUDIO SOLUTION!

www.studioensemble.com



MICROWAVE RECEIVER
Nucomm Newscaster DR

Digital COFDM diversity HD/SD receiver offers DVB-T compliance at 6MHz, 7MHz and 8MHz channels; provides variable IF bandwidth from 4MHz to 16MHz in the 1.99GHz to 2.7GHz band and from 4MGz to 24MHz in the 6.4 to 7.1 band; offers optional dual or quad-diversity demodulators; employs maximal ratio combining; remote control capability via RS-232/RS-485 as well as Ethernet connections; features a built-in spectrum analyzer.

908-852-3700; www.nucomm.com



AUDIO CODEC
APT WorldNet Oslo

Designed to transport high-quality audio and data over various digital networks; features several failsafe options that ensure audio is available under extreme circumstances; delivers high-quality audio with low latency due to its use of the Enhanced apt-X algorithm.

323-463-2963; www.aptx.com

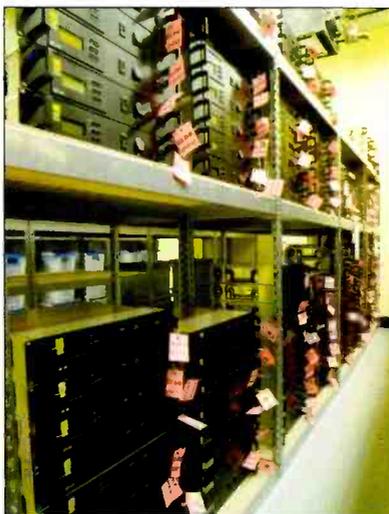
AUDIO NETWORKING
Aviom Pro64 series

Line of products includes 6416i analog input module, 6416m mic input module, 6416dio digital I/O module, 6416o output module, 6488io analog I/O module and MH10 merger hub; all series products include high-end audio features such as variable sample rates up to 192kHz, high channel count and unlimited system expansion.

610-738-9005; www.aviom.com

TECHNOLOGY SEMINAR

too surprising given the explosion in high-definition production of major — and even less than major — sporting events and the ongoing building boom in HD teleproduction vehicles.



At NAB2006, RF Central showed photos (including the one above) of stocked shelves to demonstrate it's ready to replace analog radios as part of the 2GHz relocation.

Computers, data and file transfers

There has been digital video since the introduction of the D1 format two decades years ago, but only within the past few years have file-based systems, which leverage IT technology in a broadcast setting, brought the workflow efficiencies common in other industries to the domain of television.

For the past couple of NAB conventions, the concept of FTP file transfer via ENG transmission has been discussed and technology demonstrated. This year, at least two vendors — Microwave Radio Communications and Broadcast Microwave Systems (BMS) — brought deliverable systems to the floor.

The concept is simple: Encode IP traffic into the video data stream transmitted back to the station, giving journalists in the field the ability to FTP edited packages and B-roll. Couple this technology with a return link via microwave, a portion

of a multicast DTV channel, wireless broadband Internet provider or even an EVDO cell phone network, and suddenly the newsroom extends to the ENG truck. Reporters can now operate in the field as if they were behind their computers in the newsroom reading news wires, writing scripts, editing footage, producing voiceovers and filling in lower-third templates.

BMS showed the Truck-Coder II (TC-II) media router, an add-on to its TC-II COFDM digital microwave system. The media router system consists of two parts: the Mobile Media Router that resides in the ENG truck and the Fixed Media Router at the receive site.

The Mobile Media Router system scales the IP throughput to the amount of available bandwidth. That means during a live shot, an FTP transfer of offline material can be scaled back, and when the stand-up is complete, it can be ramped up to allot the entire channel to the FTP transfer. A variety of data return options can be used with the TC-II Media Router system. At NAB2006, BMS held out EVDO cell service as a likely, viable solution.

Leveraging the power of IP wasn't confined to the TC-II Media Router in the BMS booth. The company also showed a couple of important enhancements to the TC-II COFDM microwave system: a simplified set-up menu structure and IP addressability. These allow station engineers to load presets into the TC-II or to make tweaks to it using BMS software running on a PC connected to the unit via Ethernet. Additionally, this approach relieves engineers of the time-consuming task of setting up each TC-II at the station individually. Rather, once operating parameters are established and saved on a PC, they can be transferred to multiple TC-IIs quickly and efficiently.

MRC demonstrated its IP solution in its booth with a link from an ENG truck parked between the Central and South Halls of the Las

SENCORE

Your Complete Receiving Decoding Solution For -



QAM

**MPEG-2 4:2:2
& 4:2:0**



Atlas MRD 3187A Modular Receiver Decoder



Off-Air

8-VSB

IP



Ideal for use in network contribution/distribution terrestrial reception/integration, digital terrestrial/satellite news gathering, and confidence monitoring, the MRD 3187A provides complete flexibility for any system architecture.

With 8 available I/O slots, it is configurable as either a single 8 slot, or as two completely independent 4 slot modular receiver decoders. The Atlas Management System also provides you with the ability to monitor, manage, upgrade and run asset management reports remotely with ease.

The MRD 3187A provides the quality and flexibility that is simply not found in any other professional receiver decoder.

**New Interfaces
Coming Including:
DVBS2, COFDM,
DVB-CI, & H.264**

For More Information, Simply Call
1-800-SENCORE(736-2673) or see us
at www.sencore.com



LPTV DIGITAL TRANSMITTER

Rohde & Schwarz SV8000

Compact and flexible UHF transmitter; outputs power to 500W for ATSC operation; based on the company's SC800 digital exciter; features highly modular construction; system also supports DVB-T/H operation.

410-910-7800

www.rohde-schwarz.com/usa



HD CAMERA

Panasonic AJ-HDX900

Multiformat DVCPRO HD camcorder; records clear 100Mb/s HD images in any of 11 video formats at 60Hz and 50Hz; native 16:9, 2/3in HD, 1-million pixel 3-CCD system; high sensitivity of F10 (at 2000 lux) and low-light shooting down to 0.032 lux (at+62 dB gain); 14-bit A/D DSP circuits; 4:2:2 color sampling and independent frame compression; three cine-like gamma modes replicate the look and feel of film.

800-528-8601

www.panasonic.com/broadcast



CHANNEL BRANDING SYSTEM

Utah Scientific MC-400

Can be used as a standalone or part of a multichannel master control system under the control of an MC-2020 master control network; can be installed in an output slot of a UTAH-400 router frame, giving the processor full access to every signal within the router; system automatically changes between SD and HD operation by sensing the reference input signal.

801-575-8801; www.utahscientific.com

Vegas Convention Center. Using the MTX4000 ENG encoder-modulator, a live HD feed from the truck was transmitted using COFDM at 20Mb/s along with FTP traffic to approximate how the system could be used in the field to simultaneously transmit live video and support offline file transfer. With the MTX4000, ENG crews can allocate bandwidth to FTP transfer based on existing needs — less during live shots, more at other times.

MRC identified a number of wireless links that could be used for a return channel with the MTX4000 system. However, from a practical point of view, unlicensed wireless 900MHz LAN extensions and EVDO cell phone service appear to be the most viable. While 900MHz systems offer good propagation, the band is pretty congested; therefore, EVDO may prove to be the preferred technology for a return link.

A viable return link is critical to the adoption of this file transfer from the field because it allows dropped data packets to be re-requested and delivered. Without it, broadcasters couldn't have confidence that files were delivered intact and ready for use, obviating the promised benefit to workflow.

Fade to black

Data transfer also introduced a degree of unpredictability into what the ultimate shape of ENG will become post 2GHz transition. While the industry is hard at work completing inventories of microwave equipment and negotiating with Sprint, a few have begun to push the envelope with file transfer.

KRON chief engineer Craig Porter and BitCentral CEO Fred Foucher presented a white paper at the conference on April 25 titled "Files to video journalists, a case study of organizational change At KRON 4 in San Francisco," which revealed the station currently is testing a Bay Area WiMax network for possible live contribution from its video journalists.

Running at 2.5Mb/s, the live shots will run over the WiMax connection from the carrier into the KRON building — staying in the WiMax network without being subjected to the public Internet — to protect contribution from latency. The WiMax service provider currently has 20 towers delivering coverage to the metro. Maximum distance from user to tower is 20mi, and the service provider sells full duplex data transmission from 1Mb/s to 7Mb/s and provides "a pilot carrier to establish a connection with the tower," the white paper said.

As envisioned, a KRON video journalist would set up a 12in-sq flat antenna on a tripod and point it at a local tower. The WiMax system would automatically assign a channel to the video journalist for file transfer. According to the paper, because the video journalists in the field and the station share the same network, "it is possible to use this type of connection to contribute live video."

Additionally, Inmarsat demonstrated its BGAN, a broadband global area network satellite system. It takes the concept of file transfer to its logical extension, offering broadcasters a way to contribute voice, video and data from 85 percent of the world's landmass over a broadband satellite network.

The KRON application and the promise of Inmarsat's BGAN satellite system demonstrate the growing importance of file transfer technology as forward-thinking broadcasters begin to experiment.

One day, this may transform the ENG landscape into something more akin to the World Wide Web than a dedicated point-to-point transmission system. When that will happen is anyone's guess. But one thing is certain: NAB2007 is likely to provide a clue.

BE

Phil Kurz authors several Broadcast Engineering e-newsletters, including "ENG Update," "HD Update," "IPTV Update," "News Technology Update" and "RF Update."

THE MOST AWARD WINNING TELEVISION TRANSMITTER MANUFACTURER 4 YEARS RUNNING!

2006



Broadcast Engineering Magazine - Engineering Excellence Award
WCJB-TV/DT complete turnkey analog and DTV transmitter system



Broadcast Engineering Magazine - Pick Hit
Axciter ATSC Exciter-Modulator



Television Broadcast Magazine - Top Innovation Award
Axciter ATSC Exciter-Modulator

2005



Broadcast Engineering Magazine - Engineering Excellence Award
Mt. Wilson Project, the industry's largest analog/DTV multi-transmitter system



Broadcast Engineering Magazine - Pick Hit
"Dual Use" digital/analog transmitter technology



TV Technology Magazine - Star Award
As a leader in DVB-H transmission systems



Television Broadcast Magazine - Top Innovation Award
"Dual Use" digital/analog transmitter technology

2004



Digital TV/Television Broadcast Magazine - Top Innovation Award
Innovator HX, the first VHF transmitter design of the 21st century

2003



Broadcast Engineering Magazine - Pick Hit
DTxA2B Distributed Transmission Adaptor



Digital TV/Television Broadcast Magazine - Top Innovation Award
DTxA2B Distributed Transmission Adaptor

It is quite an honor to be recognized by the most respected industry publications for four years in a row. Of course, this is not surprising to Axcera customers who have been enjoying the industry's best technology, quality and support for nearly 25 years. We would like to thank each committee for once again selecting Axcera to receive these prestigious awards.



the rf experts
103 Freedom Drive, Lawrence, PA 15055
t: 724.873.8100 f: 724.873.8105
www.axcera.com info@axcera.com

NLE
Thomson Grass Valley
EDIUS 4.0

Real-time, multiformat video editing solution; new features include multi-cam support; nested sequence editing, improved timing tools and key frame support; real-time monitor preview for up to eight cameras; master channel preview; provides the flexibility of an NLE environment with the feel of a live switcher.

800-547-8949; www.grassvalley.com

CAPTURE CARD
Blackmagic Design
DeckLink HD Pro PCIe

The dual-link HDTV 4:4:4 12-bit SDI card offers high-quality, 14-bit analog video monitoring for Mac and Windows computers; features twin HD-SDI inputs and outputs for 4:4:4 HD connections; can instantly switch to 4:2:2 HD-SDI or SD-SDI; supports all SD and HD standards.

702-257-2371

www.blackmagic-design.com

HYBRID SDI/COMPOSITE SWITCHER
Brick House Video
Callisto-F

A 1RU 19in rack-mount switcher; offers full front panel control for local operation, without the need for a remote-control panel; provides industry-standard control interfaces for editing and automation; is 525/625 compatible.

+44 1962 777733

www.brickhousevideo.com



DESKTOP PRODUCTION SYSTEM
Dayang D3-Edit

An infinite-layer multiformat titling, animation and real-time post production compositing system with advanced tools and high performance; operates within a transparent database structure ideally suited to a networked tapeless environment; fully compatible with Panasonic's P2 solid-state capture format, allowing seamless ingest; open modularity for third-party applications.

+44 1234 271 053; www.dayang.com

TECHNOLOGY SEMINAR

IPTV

BY PHIL KURZ

It's amazing what can happen in one year's time. At NAB2005, Verizon Communications CEO and chairman Ivan Seidenberg recruited broadcasters to be a part of the company's FiOS IPTV plans. A year later, Verizon went to Las Vegas with FiOS service rolled out to a number of communities in New Jersey, New York, Texas and elsewhere, with more on the way.

NAB2006 also saw the optimistic assessment of Phil Corman, director of worldwide partner development for Microsoft's TV division. He said that 2006 is the year IPTV becomes a reality. With AT&T's impending deployment of its IPTV service, Project Lightspeed, and similar near-term rollouts of IPTV service planned from British Telecom and Deutsche Telekom — all deploying Microsoft TV IPTV Edition — it's little wonder why Corman sees a bright future for IPTV.

In fact, the NAB was so enthused about the prospects for high interest in IPTV at this year's convention that it dedicated an entire conference track to the subject. But before the exuberance over IPTV turns irrational, several issues must be addressed, and NAB2006 provided familiar and some not-so-familiar vendors with a good forum for their solutions.

The wide world of IPTV

Broadcasters know Tektronix for its video test and measurement expertise, but what they may not know is there's more to the company than the folks based in Beaverton, OR. Tektronix also has a team in Richardson, TX, which comes from a network and IP background. With a foot in both the video and the IP world, Tektronix believes it's well positioned to play in the emerging IPTV space.

Giving credence to the claim, the company highlighted its new

Spectra2|VQM monitor for diagnosis and analysis of streaming video transmitted via Internet Protocol and its new Cerify automated quality verification system for file-based audio and video. The Spectra2|VQM provides portable monitoring of QoS, as well as forward error correction analysis.

Part of the Tektronix Internet Protocol Diagnostics (IPD) product portfolio, it can measure multiple, concurrent SD and HD video streams transported over RTP and MPEG-2 transport stream protocols. With the



One question on broadcasters' minds was how to get 16:9 images shrunk to 1:1 for cell-phone displays so they can play a role in the next new channel.

Spectra2|VQM, IPTV operators can verify subscribers are receiving their requested service when they request it and at an acceptable quality.

Cerify reaches beyond just IPTV in its application, but for network operators, it can automatically test all aspects of stored compressed video and audio quality to assure it meets system specs, including desired format, resolution, bit rates, video and audio levels, and standards compliance. With Cerify, network operators can make sure video and audio

files are encoded properly when measured against a variety of industry standards, including MPEG-2, MPEG-4, H.264, VC-1 and 3GPP.

At Snell & Wilcox, conforming to multiple standards on multiple dis-



Viewing images on a Treo was easy ... as long as you were in the IPTV demonstration area. However, it's coming soon to a corner near you.

tribution devices, including IPTV networks, took center stage during NAB2006 with the introduction of Helios. Helios combines Ph.C motion estimation used in Snell & Wilcox's standards converters and FormatFusion technologies to build a system that allows content producers to master once and distribute anywhere, including IPTV, video on demand, mobile video and video iPods.

Helios allows content producers to automate the conversion process while still maintaining control over video, audio and metadata for the desired output format in a single pass. Helios dynamically scales the processing required for the conversion via an intelligent job manager that allocates CPU cycles to the conversion process at hand. A distribution module lets users repurpose content automatically to the correct distribution platform. And an interoperability module allows users to move files between IT hardware.

More IPTV

At Harris, the focus was on a comprehensive IPTV solution that covers business and operations, infrastructure, test and measurement, monitoring and network management.

By combining Harris' Leitch-brand video infrastructure products with content management software, the company is seeking to offer telcos a complete IPTV headend and media management solution as they roll out triple play services.

To make its IPTV offering, Harris is drawing on its workflow solutions

CAMERA RECEIVER beyerdynamic KE 800

Uses automatic channel targeting (ACT) function to search for an interference-free frequency; transmits via infrared to the matching handheld or pocket transmitter of the company's Opus 800 and Opus 500 Mk II wireless systems and locks in the frequency; comes equipped with an LC display that indicates the battery level of the transmitter, frequency and channel, squelch, AF and RF level.

631-293-3200

www.beyerdynamic-usa.com

Clearly Different...
High Resolution Meets Easy Installation.

Introducing Brilliance® RGB Banana Peel® Hi-res Component Video Cables From Belden.

The unique patented design of Belden's hi-res RGB video cables eliminates the need for an overall jacket, simplifying installation and saving you time and money.

Belden Brilliance Mini Hi-res Component Video cables offer true 75 ohm high-frequency performance, making them ideal for demanding applications such as high resolution VGA on large screens, HDTV, Hi-res CAD, animation, editing and special effects. And now, to meet the needs of the installer, they are offered in Belden's unique Banana Peel composite configuration.

With no outer jacket, each individual cable is easy to identify — just peel them off the center spline and terminate! The elimination of the outer jacket also increases the cable's flexibility and allows the use of a smaller size conduit.

But don't trust us — see it for yourself. Get a FREE product sample and complete technical information today!

For more information, call:
Belden CDT Electronics Division
1-800-BELDEN-4.

Or, go to Belden's Web site at:
www.belden.com

BRILLIANCE®

Belden CDT

© 2005, Belden CDT Inc.



HD WEATHER GRAPHICS
Baron VIPIR HD

Provides crisp picture quality, graphics and content; FasTrac and StormWarn are also available in HD; chroma key and weather wall integration supports hand gestures; Voice Recognition allows meteorologists to direct video via their voice commands; MicroTrac follows the center line of a storm as it passes over schools, churches, houses and hospitals.

256-881-8811; www.baronservices.com

ENG TRANSMITTER
Microwave Radio
Corporation PTX-PRO

Full-integrated, self-contained, portable platform; supports integral MPEG-2 SD/HD encoding, plus analog or COFDM and high-speed single carrier digital modulation in bands between 1.9GHz and 2.6GHz; features user-friendly front panel controls, built-in AC/DC power supplies and nine programmable presets, which make set-up easy.

978-671-5700; www.mrcbroadcast.com



WAVEFORM MONITORS
Euphonix System 5-B

For the System 5-B digital audio mixing system; new modules are operationally compatible with previous versions of the System 5-B but have higher resolution displays at the top of each module; new touch-sensitive knobs include color-coded LED rings at the base for easy identification of the knobs' functions; new modules also include faster embedded microprocessors for quicker response and boot times.

650-855-0400; www.euphonix.com

TECHNOLOGY SEMINAR

for sales, traffic and scheduling, digital asset management and automated playout, as well as its Leitch line for signal processing, ad insertion, routing and switching. Add to the mix Videotek's line of test and measurement offerings, and the company has positioned itself to provide a complete IPTV solution.

At NAB2006, Harris announced that recently acquired Leitch has supplied systems to PCCW in Hong Kong for use in its IPTV video headend. Called "Now Broadband TV,"

chip's design and performance was nearly complete as of NAB2006. The first ViBE MPEG-4 encoders using the chip are expected at the beginning of next year. Thomson anticipates a range of applications for the processor, including its use in Grass Valley encoders, signal processing equipment and transcoders for delivery of SD and HD signals over IPTV networks.

TANDBERG Television launched a complete IP-based system intended for contribution and distribution IP video



Dale Mowry, VP and GM of the Harris Television Broadcast Systems business unit, demonstrates live video on a cell phone. The company supports both DVB-H with its Cool Play transmitter and QUALCOMM's MediaFLO system with the Atlas Mobile and Ranger Mobile series of transmitters.

PCCW's service is one of the largest IPTV deployments in the world, serving more than 550,000 subscribers with broadband television. The service offers 100 video channels and more than a dozen music channels.

New silicon and greater video compression efficiency highlighted Thomson Grass Valley's IPTV focus at the show. The company unveiled its Grass Valley Advanced Compression Processor and announced that its first application will be in its ViBE HD MPEG-4 encoder.

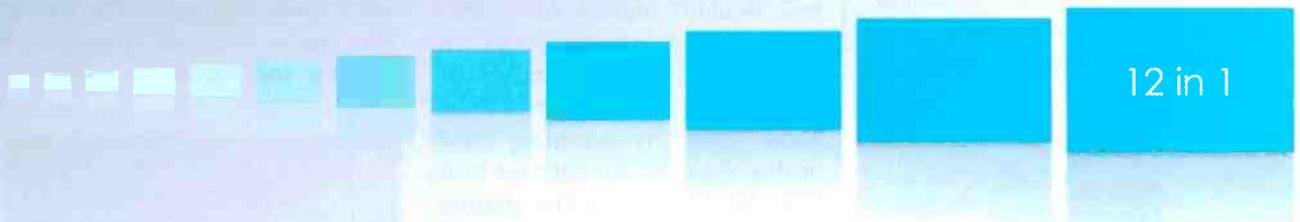
Developed over the past three years by a team of Grass Valley and Thomson engineers, the new chip has demonstrated the ability to encode high-definition MPEG-4 in bandwidth as low as 4Mb/s while maintaining high image quality. Verification of the

headends and for large and small direct-to-home cable, satellite, terrestrial and telco platforms. The iSIS 8000 IP system offers MPEG-2, MPEG-4 AVC and SMPTE VC-1 video encoding and transcoding, IP multiplexing and new receiver and decoders. It is controlled and managed by the company's nCompass application.

The company also unveiled the MX8400 IP multiplexer for use in central headend applications and integrated its SkyStream MediaPlex and iPlex digital video processing platforms into the iSIS 8000 system. The MediaPlex and iPlex can encode MPEG-2 and MPEG-4 AVC SD, transrate MPEG-2 SD, transcode MPEG-2 to MPEG-4 AVC, as well as provide multiplexing, demultiplexing, routing and streaming.

TOUCH IT...

From the company that invented in-rack audio & video monitoring



12 in 1

The New Touch It Touch Screen multi channel LCD Video System from Wohler



With a simple touch of the screen, the Touch It, dual 7" high resolution LCD screen monitors 12 asynchronous composite video inputs with mini router function and external multi-screen output capabilities. Touch it Plus offers 12 stereo analog inputs.

For more information on the Touch it, touch screen LCD Video Monitor and other new audio and video monitoring solutions, please visit our website www.wohler.com.

- 7" wide high resolution select matrix monitor
- 12 asynchronous composite video inputs
- External multi-screen output of selected video
- Adjustable tilt screen
- 4:3 / 16:9 aspect ratio
- Durable scratch resistant touch screen panels
- Excellent Touch screen life – 35 million + touches

Wohler Wins Again!



NAB 2006 Awards

VOICE-OVER-IP INTERCOM Clear-Com Voice

PC Web client application; provides easy IP line and audio codec set-up along with diagnostics; can be monitored from a centralized remote location; codecs provide low latency audio digitization in user-selectable formats from 3.5KHz to 16KHz; provides broadcast compatible intercom and commentary over IP.

510-496-6600; www.clearcom.com



LIGHTED ETHERCON Neutrik Lighted EtherCon

Offers two light pipes for 3mm standard LEDs to indicate data transmission and status; the LEDs fit into an opening at the bottom of the light pipes, and the light pipes transmit the light to the front panel; provides all the components of Neutrik's Shielded EtherCon.

732-901-9488; www.neutrikusa.com

TECHNOLOGY SEMINAR

Around the floor

A variety of interesting IPTV developments from some lesser-known names turned up at NAB2006 as well. NeuLion highlighted its IPTV STB and service offering. The Plainview, NY, company bridges the gap between content provider and home viewer by streaming DVD-quality video via the Internet to its STB. NeuLion establishes partnerships with content providers like KyLinTV, a niche provider of Asian movies and TV shows to Asian audiences in North America, and brings its STB, network management, VOD and billing services to the table. At NAB2006, the company announced it's working with the New York Islanders and the Catholic Church to offer similar niche IPTV channels via the Internet.

Another newcomer to NAB2006 was WhiteBlox, which, as the name

implies, offers "unlabeled" blocks of tools to allow content providers to build their own private label broadband network, including interactivity and a video component. The WhiteBlox system is a mix of integrated software and hardware, as well as



NeuLion works with content providers, like KyLinTV (shown above), to establish their own niche IPTV distribution channel. NeuLion provides the technology and set-top box to support streaming DVD-quality video over the Internet, as well as the tools for video on demand, billing and record keeping.

Fair and Balanced Color



It's true. Kino Flo's telegenic ParaBeam 400 studio fixture delivers 3,000 Watts worth of tungsten soft light on 2 Amps—without the heat and without compromising your picture's color quality! The ParaBeam's cool brilliance owes to

a special parabolic reflector that practically turns light waves into projectiles.

As for image quality, the fixture uses Kino Flo designed True Match® lamps that display professional tungsten and daylight balanced illumination (CRI 95). A center mount lets you rotate between a horizontal and vertical beam. Slide in your choice of focusing louvers to spot the beam down to a 90°, 60° or 45° pool of light. DMX, analog and manual controls can dim the light to black. Like all Kino Flos, the ParaBeam is flicker free and dead quiet.

If you think the ParaBeam looks good on paper, wait 'til you see how it looks on video.

ParaBeam

2840 North Hollywood Way Burbank CA 91505 818 767 6528 voice 818 767 7517 fax



www.kinoflo.com

management tools and services. Major components include proprietary software tools to let users build their

own network; packaged combinations of services specifically designed for five industry segments; custom-built enhancements for those with premium assets or special needs; and service elements to track, report, monitor and sell ads.

A variety of interesting IPTV developments from lesser-known names turned up at NAB2006.

Finally, Widevine Technologies announced a global deal to with Siemens Communications to make Widevine a certified content protection vendor for broadband carriers delivering IPTV services to viewers via Siemens SURPASS Home Entertainment sys-

tem. Under the agreement, Widevine will work with Siemens to provide a scalable and mature content protec-

tion system, which is necessary for operators to acquire premium broadcast and VOD content.

If NAB2005 served as a launching pad for the intertwining of telecommunications and television, NAB2006 demonstrated that both are throttling up and on their way to attaining a stable orbit in the IPTV space.

BE

Phil Kurz authors several Broadcast Engineering e-newsletters, including "ENG Update," "HD Update," "IPTV Update," "News Technology Update" and "RF Update."



HD AND SD SWITCHER FOR-A HVS-500HS

1 M/E switcher; the latest addition to the HANABI series; accepts HD, SD, HDV and DV formats; comes with 10-bit, 4:2:2 internal processing; connects to HDV cameras or PCs; is multiformat in HD for 1080/60i, 50i and 720/60p; is switchable from NTSC to PAL; standard switcher has four HD/SD SDI inputs, two PGM output and three AUX outputs.

212-861-2758; www.for-a.com

MEDIA SERVERS Videotechnics Apella

Support multiple formats from SD to HD; networked or standalone versions available; 3RU high; supports up to 4TB with RAID 1, 3, 5 and 6 options; IT-centric design; fully compatible with external NAS, SAN and DAS solutions.

404-327-8300; www.videotechnics.com

Go Native

with 1920 x 1080



V-R231P-AFHD
Price: \$5999

Marshall's new 23-inch High Definition monitor let's you GO NATIVE with 1920 x 1080 digital and analog video. For under \$6K you get a loaded package with inputs for HDS/SDI, Analog Component YPrPb, S-Video, Composite, XGA from your computer and even DVI-I for HD video or computer generated images. All the features you need for HD production, like frame markers, safe area, adjustable color temperature and Pixel-to-Pixel native display for any video format are included and can be directly accessed without menus. All of this is in a durable all metal compact package with added scratch resistant polycarbonate screen protection that can be rack mounted or used on a desk top.

Marshall Electronics

Tel.: 800-800-6608
Fax: 310-333-0688

LCDracks.com

ARCHIVE SYSTEM

Crispin CAM-HSM

A policy-based storage and retrieval system; designed around a combination of high-density, reliable RAID units; near-term and long-term storage of media can exist in the same archive system, but are managed separately based upon need; all assets are searchable and viewable in a digital library that optionally includes low-resolution proxies of each clip.

919-845-7744; www.crispincorp.com

CONTENT SECURITY

Irdeto Plsys Control System

Provides and manages encryption keys to the scramblers, enabling the scrambling of content prior to its playout as a broadcast stream; generates unique encryption keys for each user's session; uses patented techniques for key generation to ensure maximum security and limited bandwidth usage.

425-497-2800; www.irdeto.com

MULTIPLEXER/ DE-MULTIPLEXER

Network Electronics SDI-TD-MUX-4/DMUX-4

Time division multiplexes four SDI, DVB-ASI or SDTI signals into one HD signal; all signals are accepted synchronous or asynchronous and are automatically format-detected; a built-in routing switcher allows channel swapping on both mux and dmux devices.

800-420-5909

www.network-electronics.com



TEST AND MONITORING SYSTEM

Pixelmetrix DVStation Mini

A single-port version of the 21-module DVStation; available in two models: an ASI version for transport stream analysis and an 8VSB RF version for ATSC monitoring; allows remote control via LAN or the Internet; is controlled using a standard PC with Web browser or SNMP network management system; designed for single-source monitoring at multiple locations.

954-472-5445; www.pixelmetrix.com



HDV VCR

Sony HVR M25U and M15U

Records and plays HDV 1080i, DVCAM and DV SP; compatible with mini-size DV cassettes as well as standard-size cassettes; enables four hours of HDV recording with compatible tapes; supplies downconverted signals from HD to SD; is switchable between 60Hz and 50Hz (NTSC/PAL); supported connectivity options include i.LINK (IEEE-1394) digital interface, component output, S-Video I/O, composite I/O and analog audio I/O.

800-686-7669

www.sony.com/professional

IP-BASED VIDEO

HEADEND TANDBERG iSiS 8000

Complete IP-based system includes MPEG-2, MPEG-4 AVC and VC-1 video encoding, IP multiplexing and new receiver and decoders; uses SkyStream xPlex multiplexing; open standards-based; supports up to four independent multiplexed outputs from a single unit; Reflex statmux available.

678-812-6300; www.tandbergtv.com

AUDIO ROUTER

PESA Cheetah DRS

Base unit measures 64 x 64 in 1RU or 128 x 128 in 2U; is expandable to 2048 x 2048 in 36RU; offers a small form factor and distributed architecture that is fully compatible with Dolby E; supports both synchronous and asynchronous signals and sample rates up to 96kHz.

631-912-1301; www.pesa.com

TELESTRATOR SYSTEM

e-mediavision POINT-HD V2

New version of the broadcast telestrator and presentation system includes enhanced HD graphics engine for effects and tools; allows on-screen talent to draw and annotate over live video, using animated graphic tools to enhance the viewer experience; features a touch-sensitive control surface (LCD, plasma or point-holographic screen) with a simple graphical interface.

+44 208 755 2014

www.e-mediavision.com

TALLY SYSTEM

TSL TallyMan

Enhancements include ESP-1 and ESP-1R expanders, which allow the tally system to be extended, with increased capacity for serial and parallel relay connections; TM1 and TM2 system controllers run the program as an embedded Windows application, allowing real-time control of the system.

+44 1628 676 200; www.tsl.co.uk

SPORTS NEWS SYSTEM

IBIS Highlighter

A broadcast tool designed to enable fast turnaround and management of sports events, studio-based programming and outside broadcasts; does not rely on dedicated hardware and can be used within an existing video server network; captures all associated metadata from a sporting event, studio transmission or OB production, as well as highlights; retains that data for use by third-party systems.

+44 1483 280 208; www.ibistv.com

MICROPHONE

PREAMPLIFIER

Prism Sound MMA-4XR

Each of its four channels has controls for gain (60dB in 3dB steps), phase invert, cut (mute) and 48V phantom power; input and output headroom extend to +28dBu; frequency response extends to more than 200kHz; phantom power circuit provides a higher than usual level of current output.

+44 20 8481 1003; www.prismsound.com



MASTER CONTROL SWITCHER

Pro-Bel Masterpiece

Offers HD and SD switching, advanced audio processing and flexible keying and DVE options; upgrades include the addition of an HD DVE and the option to install Dolby E decoders and logo storage; now benefits from four keyers and has the ability to handle audio mixing.

925-735-9269; www.pro-bel.com



ENG TRIPOD Miller Sprinter II

Dual action, patented Sprinter II leg locks allow set-up in seconds; single stage and two-stage tripod combinations are available in ultra-light, high strength carbon fiber or alloy tubing; an inline carry handle allows safe and comfortable transport.

973-857-8300; www.miller.com.au



FIBER-OPTIC LINK Multidyne DTV-4000 series

A four-channel SDI serial digital video fiber-optic link with 16 audio channels or eight AES/SPDIF channels; fits 1RU with a modular tray that will house up to three DVM-4200, DVM-8200 or DIM-8200 cards; supports 24-bit stereo audio flat from 20Hz to 20kHz with SNR greater than 90dB and THD less than 0.5 percent; supports 110/220 VAC and, optionally, 48 VDC.

800-488-8378; www.multidyne.com



TV SIGNAL MONITORING AND VERIFICATION IdeasUnlimited ContentProbe

A software and hardware system for low-cost monitoring and verification of TV signals; Compliance module produces a browse stream of media, which is time code indexed and searchable; FaultTracker detects faults, including the presence of color bars, idents, black and audio silence; Verification compares TV signals in real time and checks content, aspect ratio, etc.; uses Media FingerPrint to generate a small, digital fingerprint of any video picture; the image fingerprint can then be used to monitor and compare other video sources with the source signal.

+44 870 162 7200; www.ideasunlimited.tv

PLAYOUT CONTROL Omneon ClipTool Pro

Enables users of the Omneon Spectrum media server to monitor and control playout and record functionality via an easy-to-use graphical user interface; copy-clip function creates sub-clips from manually-selected in and out points.

866-861-5690; www.omneon.com

CONFIGURATION TOOL Opticomm Optiva Configurator

Web-based configuration tool designed for the Optiva Series, a modular fiber-optic communication platform; allows users to create an Optiva system online with all inputs and outputs desired for their specific application.

858-450-0143; www.opticomm.com

Time to Celebrate



35 Years of Precision Timing

Broadcasters have counted on ESE precision master clocks and timing-related products for over 35 years. ESE products accurately synchronize broadcast operations using a choice of GPS, WWV, Modem, Crystal or line frequency for affordable, reliable, perfect time.

Spend a few seconds on www.es-web.com to discover a brilliant display of timing systems that are designed for easy installation, set-up and operation.



142 S erra Street
El Segundo, CA 90245 USA
Tel: (310) 322-2136
Fax: (310) 322-8127
www.es-web.com

PROMPTERS

QTV Professional series

Line consists of four prompters: Professional series 8, which is suited for hand-held as well as SteadiCam use; Professional series 10, which is purpose-built for use on jib arms or small tripods where weight is limited but greater visibility and sight distance is required; Professional series 12, which is designed for studio production and field production applications; and Professional series 17, which features a unique combination of mounting, lightweight construction and a high-contrast display.

203-406-1400; www.qtv.com

STORAGE TECHNOLOGY

Thomson Grass

Valley REV PRO

REV PRO drives will be delivered as a standard feature for customers of NewsEdit XT and Canopus EDIUS NLE systems; also available as a standalone option for existing PC-based desktop or laptop systems; fully compatible and integrated with current NewsEdit XT and EDIUS version 3.6.1; ideally suited for IT- and file-based acquisition and production.

800-547-8949; www.grassvalley.com



DIGITAL AUDIO MIXER

Renegade Labs Blue1328

Compact audio mixer allows editors to mix 16 channels at once via eight stereo faders; master fader gives instant adjustment to all eight program outputs; a built-in monitor matrix provides custom and preset monitor routing, allowing for any output channel to be routed to any or all monitor channels; features eight AES discrete inputs, eight AES discrete program outputs and eight analog monitor outputs.

530-273-7047; www.renegadelabs.com



FILE-SHARING SYSTEM

Small Tree

Communications BlazeFS

Designed for Macs; offers users the ability to store large data files, such as uncompressed HD video, on a file server rather than local to each client; allows clients to access these files at speeds similar to the local disk; can drive data to the maximum speed of a Gigabit Ethernet link; works in concert with Small Tree's 10Gb Ethernet and InfiniBand products.

866-782-4622; www.small-tree.com

TRUST

The guy you want sitting next to you...



Broadcast Engineering is that guy.

Want information about what's going on at the FCC that might affect the way you do business? Say no more.

How about news regarding the ever-changing technical data, specs, interfaces, industry trends, and equipment needed to stay that crucial techno-step* ahead?

We'll look no further than *Broadcast Engineering's E-Newsletters*:

- *RF Update* • *Digital Signage Update* • *News Technology Update*
- *Sports Technology Update* • *Strategic Content Management* • *Show Updates*

And the great thing is, we'll never ask to borrow money for lunch.

Subscribe today and thrive tomorrow: <http://www.broadcastengineering.com>

*Testimonial courtesy of Kevin White, Independent Program Producer

TRUSTED, Technology Industry Leader



MEDIA FILE TRACKING **Studio Network** **Solutions Postmap**

Designed to easily find, manage and catalog files located on a SAN, file server and removable storage such as FireWire drives and DVDs; enables users to add custom metadata fields to project files, folders and media clips; workflow feature enables users to define and track the steps throughout their entire production process.

877-537-2094

www.studionetworksolutions.com



HDTV VIDEO AND **AUDIO MONITORING** **Zandar Technologies** **Predator HD8**

HDTV video and audio monitoring multiviewer system; features new Z-Configurator user software and ZdH Zandar dual head display facility; comes in a compact 1RU system; has eight auto-sensing inputs, allowing both HDTV 720p and 1080i formats and legacy SDI (270Mb/s) signals to be used together, bridging the migration to HDTV signal formats.

321-939-0457; www.zandar.com

CAMERA-MOUNTED **FIBER-OPTIC SYSTEM** **Telecast Fiber Systems** **CopperHead G2**

Provides full triax-like functionality for professional camcorders via a single, lightweight, tactical fiber-optic cable or via SMPTE hybrid cable for remote camera power; interface supports all signals between the camera and 1RU base station, including bidirectional analog composite or component video, digital SDI and HD-SDI video, and multiple audio.

508-754-4858; www.telecast-fiber.com

CONTENT SECURITY **Thomson NexGuard**

Comprehensive digital rights and content management package; protects, traces and monitors digital content in the professional media environment from production to post production through distribution; includes watermarking, encryption, controlled access and forensic data solutions to manage and secure the storage, transfer and viewing of content.

503-526-8150; www.thomson.net

VIDEOCASSETTE **Maxell D-5**

Format handles standard-, wide- and high-definition television configurations; uses 0.1 µm diameter ultra-fine Ceramic Armor Metal particles; has a thin, highly rigid PolyEthyleneNaphthalate base film material; uses technology that enables the tape to evenly clean the head surface without causing excessive wear, is available in 12-, 33-, 48- and 63-minute lengths, and 94- and 124-minute lengths.

800-533-2836; www.maxell-usa.com



DAM SOFTWARE **Focus Enhancements** **ProxSys version** **5.0 software**

A DAM server software update designed for medium- and large-scale deployments in video-driven applications where users need to organize rich multiformat media, including HD content; manages terabytes of low- and high-resolution video, audio, images, documents and data from a Web browser interface.

800-338-3348; www.focusinfo.com

VIDEO NETWORKING **Harris NetVX**

Multi-service video networking product; provides improved bandwidth efficiency for increased multichannel operations, enhanced HD services, disaster recovery, event support, remote newsgathering, and IP-based video transport; leverages packet switching, providing cost-effective, bidirectional transport over ATM, IP, DS-3, fiber (OC-3), satellite and microwave networks; supports triple-play services in one chassis.

513-459-3400; www.broadcast.harris.com

fischer broadcast connectors



HDTV 1053™

- No Epoxy-
No Polish
- Incorporates
Unicam®
Fiber-Optic
technology
- Fast and easy
termination
- Truly field
install-able
- Superior
connector
simplicity and
convenience
- Significant
lower assembly
labor costs

Triax 1051/1052

- American and
International
Standards
- Fits 3/8" and
1/2" cables
- Superior shielding
- Waterproof
rugged design
- Multiplex signal
transmission



Fischer Connectors, Inc.
1735 Founders Parkway
Alpharetta, GA 30004
Tel: 800.551.0121
Fax: 678.393.5401
mail@fischerconnectors.com
www.fischerconnectors.com



DIGITAL WAVEFORM MONITOR

Tektronix WFM7100

Supports SD/HD and composite video; options include support for monitoring digital audio (AES/EBU/analog and Dolby); SDI signal measurement and in-depth digital data analysis; integrated high-resolution XGA display; MyMenu feature allows users to place most frequently used functions in a single on-screen menu.

800-833-9200; www.tektronix.com

CG INPUT OPTION

VertigoXmedia VxASI

An option for the VertigoXG character generator; provides four DVB-ASI inputs with real-time demuxing and decoding of MPEG-2 video and audio streams; the decoded video and audio streams are sent to the VertigoXG rendering and compositing engines as standard SDI or HD-SDI video inputs and can be fully branded, DVE'd, mixed and output as either SDI or HD-SDI signals.

514-397-0955; www.vertigoxmedia.com

ZOOM LENSES

Thales Angenieux HD-e series

Cost-effective series consists of three lenses: the 19 x 7.3 AIF HD-e, with a zoom ratio of 19X and focal length ranging from 7.3mm to 139mm; the 10 x 5.3 AIF HD-e, with a zoom ratio of 10X and focal length ranging from 5.3mm to 53mm; and the 26 x 7.8 AIF HD-e, with a zoom ratio of 26X and focal length ranging from 7.8mm to 203mm.

973-812-3858; www.angenieux.com

HD QUAD SPLIT VIDEO PROCESSOR

Image Video VxV-4HD

Provides four auto-sensing SD-SDI and HD-SDI inputs; selectable 16:9 and 4:3 aspect ratios; DVI output UXGA 1600 x 1200, 1920 x 1080p; optional SD/HD SDI output; any input may be zoomed to full screen resolution; audio metering and monitoring for embedded SDI audio.

416-750-8872; www.imagevideo.com



OUTDOOR CAMERA HOUSING SYSTEM

Telemetrics LWP-HOU

Weatherproof system is available in various sizes; can accommodate various type and size camera configurations; provides complete camera setup and lens control functionality along with pan-and-tilt movement; options include encoded positional feedback for position tracking, as well as a heater, wiper and washer; a weatherproof local power supply enclosure is also available.

201-848-9818; www.telemetryinc.com

AUDIO METERS

Logitek Tru-VU

More than 50m configurations with analog, Bright-VU, Tru-VU, Super-VU and Ultra-VU series of meters; all use digital signal processing providing precision metering that conforms to international ballistics standards; availability of 96K sample rate to support all Super-VU and Ultra-VU, including those packaged for surround monitoring.

713-664-4479; www.logitekaudio.com

ENCODING PLATFORM

Inlet Technologies Fathom 2.5

Offers real-time HD and SD encoding; now includes MPEG-2 ingest, an SD-only option, interlaced encoding, watermarking and AVISynth support; features a user interface with dockable elements that can be viewed as a dashboard or arranged in a multiple-monitor configuration; available in six different configurations to meet post-production needs.

919-856-1080; www.inlethd.com

NEWSROOM EDITOR

JustEdit vsnscenes

The low-cost editor allows low-resolution proxy preview in variable speeds directly from the chosen format (XDCAM or P2) and selection of a list of clips or subs; automatically uploads high-resolution content to shared video servers; enables management of associated metadata, creating and importing EDLs and selection MXF for transcoding the selected high-res files.

+34 937 349 970; www.vsn-tv.com



HDV-TO-DVB-ASI CONVERTER

DVEO FireBridge

Converts HD 1394 video from HDV cameras to DVB-ASI for professional environments; converts the JVC GY-HD100U 1394 720/30p output to 720/60p; also converts 25Mb/s to 27Mb/s VBR output from Sony Z1U HDV camcorder to 27Mb/s CBR; works with Terayon Cherry Picker and HD satellite receivers from TANDBERG, Harris Leitch and Harmonic.

858-613-1818; www.dveo.com

AUTOMATION

Floral Automated Join In Process (JIP)

Featured in the AirBoss presentation controller; is fully automated to provide potentially unattended join in progress of local recorded programs based on a remote signal from the network.

352-372-8326; www.floral.com

HD P2 CAMERA

Panasonic AJ-HPC2000

A P2 HD camcorder; progressive HD 2/3in 3-CCD system and 14-bit A/D processing; captures in 720p, 1080i or 480i, offers exceptional dynamic range and low light recording; high sensitivity of F10 at 2000 lux; can capture images at a minimum illumination of 0.032 lux (at +62dB); features five hot-swappable P2 card slots, providing up to 40 minutes HD record time.

800-528-8601

www.panasonic.com/broadcast

ENCODING SYSTEMS

CONTROLLER

Digital Rapids

Broadcast Manager

An enterprise management and control application for multiple live streaming encoders; simplifies operation with automatic system set-up through discovery protocols and centralized administration and reporting; offers multiple-mode failover management; scheduling, extensive notification, including customized reports, and individual or group system management.

905-946-9666; www.digital-rapids.com

PRODUCT JACKET



**3-D GRAPHICS
PROCESSOR
NVIDIA Quadro FX1500**

A 3-D GPU with two dual-link DVI connectors, 256MB GDDR3 frame buffer memory and HD video output; offers 12-bit sub-pixel precision, full 128-bit color precision (32 bit per component) and 40Gb/ memory bandwidth.

818-486-2000; www.nvidia.com

**VIDEO SERVER
360 Systems Image
Server MAXX**

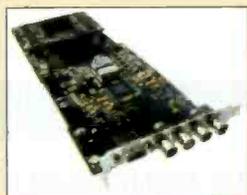
High-performance, three-channel broadcast server; with graphic store and key and fill; supports MPEG-2 video up to 50Mb; inputs MPEG-2 and DV over GigE from Apple FCP and Avid, as well as TARGA files from graphics programs; includes frame sync, SDI video ports, AES/EBU, digital, analog and embedded audio.

818-991-0360; www.360systems.com

**DI PLATFORM
Digital Vision 17 Processor
Nucoda Workstation**

A DI grading platform based on the AMD64 multi-core technology; includes a NVIDIA Quadro FX 5500 SDI graphics board; platform supports the full range of Nucoda data-centric software; allows post-production houses to deliver cleaner product to broadcasters.

818-769-811; www.digitalvision.se



**VIDEO CAPTURE CARD
Bluefish444 HDIFury**

A 4:2:2 video capture card integrated with Aspex's Accelera HD MPEG-2 encoder card; offers high-quality, real-time HD MPEG-2 video compression for all HD formats up to 1080i 60; allows users to create cost-effective solutions for HD archival, live streaming, post production and IPTV applications.

+61 3 9682 9136; www.bluefish444.com



**NONLINEAR
WORKFLOW ENGINE
Avid Interplay**

Nonlinear workflow engine fusing integrated asset management, workflow automation and security control into a single system; connects teams to a shared-data and media backbone and smoothly manages the flow of projects from inception to completion using security and powerful revision control; tools included for searching, archiving, viewing, logging, automatic transcoding, dual-resolution encoding, and intelligent tracking of multi-resolution proxy files.

800-949-2843; www.avid.com

2 GHz Relocation Solutions

Upgrade • Configure • Customize • Control



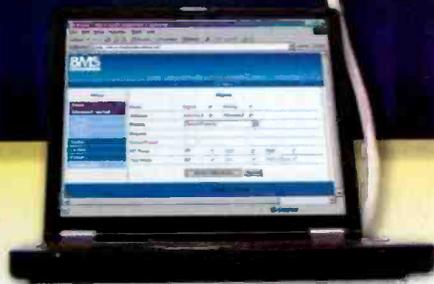
**The Truck-Coder II Front Panel
Ethernet Port Makes It Simple**

**Simplicity for the Operator,
Flexibility for the Engineer!**



Broadcast Microwave Services, Inc.

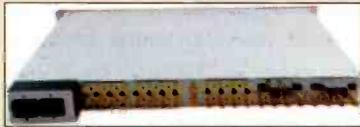
www.bms-inc.com • (800) 669-9667 • (858) 391-3050 • Fax: (858) 391-3049 • dept800@bms-inc.com



BATTERY-FREE ENERGY STORAGE Active Power CleanSource

A DC flywheel energy storage system; compatible with major UPS brands; uses a flywheel motor-generator that stores kinetic energy in its constant spinning, low-friction steel disc; compared with batteries, it reduces space requirements, temperature restrictions, replacement cycles and maintenance.

512-836-6464; www.activepower.com



MULTIPURPOSE FRAME Fjord Media free4

An open standard platform capable of housing multiple functions, including routing, optical transport interfaces, processing and distribution and conversion, in one frame with one control system; offers expandable frames from 40 to 320 ports; one crosspoint card handles all digital formats; protocol interfaces with all major routers.

+47 3352 1600; www.fjordmedia.com

HD STORAGE DEVICE Shining Technology CitiDISK HD

Palm-sized, high-capacity video storage device that provides direct HD recording and instant playback; supports Panasonic's DVCPRO HD format, including the AG-HVX200; provides 80GB, 100GB or 120GB of storage; weighs 10oz; allows users to record directly into most NLEs with instant playback.

714-761-9598; www.shining.com



VIDEO MONITORING SYSTEM JDSU NetComplete

A digital and IP video service monitoring application; provides continuous, simultaneous monitoring of more than 250 video streams, as well as test access coverage at QoS-relevant points in the network; addresses every deployment phase, including initial design, network element deployment.

408-546-5000; www.jdsu.com

HDTV ADVANCED COMPRESSION ENCODER Scientific-Atlanta PowerVu D9054

The MPEG-4 part 10/H.264 encoder supports multiple applications, including IPTV, satellite distribution, backhaul and contribution, DVB-T and xDSL; allows users to maintain high video quality, even at bandwidth-saving, low bit rates; delivers more channels over existing bandwidth, expanding the usefulness of current networks and providing opportunities to launch expanded HDTV programming and add new revenue generating services.

770-236-5000

www.scientificatlanta.com

ARCHIVE MANAGEMENT SGL FlashNet 6.0

New version features a redesigned architecture that delivers increased scalability with unlimited storage capacity and full redundancy as standard; Storage Manager is an extension that allows the user to move, copy and delete data within the archive and to defragment the archive in order to free up media space that contains obsolete data.

+44 1635 44 991; www.sgluk.com

BATTERY CHARGER IDX System Technology LC-7P

A four-channel battery charger designed for Panasonic 7.2V batteries (models VW-VBD35 and VW-VBD55); charges VW-VBD35 batteries in two hours and VW-VBD55 in 3.5 hours; features LCD displays that show the batteries' charge levels.

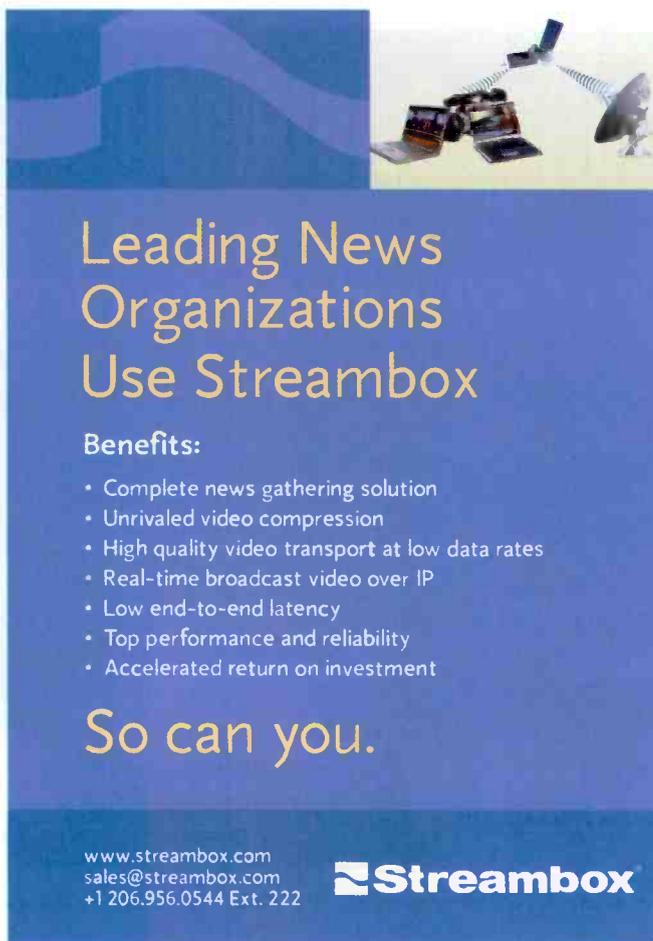
310-891-2800; www.idx.tv



CHARACTER GENERATOR Pixel Power Clarity 3000

A single-channel HD/SD switchable graphics system; configurable with a mix of character generation, still store, DVE and painting tools and has optional video clip and audio capability; provides SD-SDI and HD-SDI program and preview outputs each with key, as well as analog monitoring outputs; configurable as video and key or two video inputs, allowing live 2-D DVE of up to two HD sources; an additional pair of auxiliary inputs allow up to four squeezebacks in SD mode.

954-943-2026; www.pixelpower.com



**Leading News
Organizations
Use Streambox**

Benefits:

- Complete news gathering solution
- Unrivalled video compression
- High quality video transport at low data rates
- Real-time broadcast video over IP
- Low end-to-end latency
- Top performance and reliability
- Accelerated return on investment

So can you.

www.streambox.com
sales@streambox.com
+1 206.956.0544 Ext. 222



AES PATCHING SYSTEM **ADC Super High-Density Coax**

Designed for AES audio, 5.1 and 7.1 audio applications, 1.5RU panel features 4 x 48 coax ports (96 circuits) with a switchable termination feature that allows users to select or deselect a 75Ω termination function on each circuit pair; the normal through system is also available in a straight-through option for tie-line panels and applications where normals are not required; is rated for digital audio and SDI video up to 1GHz; features screwless mounting and 10,000 insertions and withdrawals.

952-938-8080; www.adc.com

VISUAL EFFECTS SYSTEM **Discreet Flint 9.5**

System designed for broadcast and post-production operations requiring cost-effective motion graphics and interactive visual effects in HD and SD; allows users to build promos, station ID packages, commercials and brand graphics in an instant-feedback, real-time creative environment; uses powerful paint, fast versioning, template-based content creation, 3-D particles and text tools; offers new tools, including a layer-based paint module, Autodesk's Motion Estimation technology.

800-869-3505; www.autodesk.com/me

NLE SOFTWARE **Canopus EDIUS** **Pro version 4.0**

A real-time, multiformat video editing solution with new features, including multicam support, nested sequence editing, improved trimming tools and keyframe support for color correction; supports all video acquisition formats with real-time, multi-track, mixed-format HD/SD editing, compositing, chroma keying, titling and timeline output capabilities; provides editors with real-time, mixed-format HD/SD editing of HD, HDV, DV, MPEG-2, lossless and uncompressed SD video.

408-954-4500; www.canopus.com

HD TEST GENERATOR **Trilogy Mentor XL**

The sync and test generator offers full gunlock and master SPG with multiple timing planes; operates simultaneously in 525, 625 and HD modes; additional options for analog, AES and AES/SD embedded tones and silence are available from the same unit.

800-372-3198; www.trilogys.com

MAM SYSTEM **Konan Digital** **DigitalArc for News**

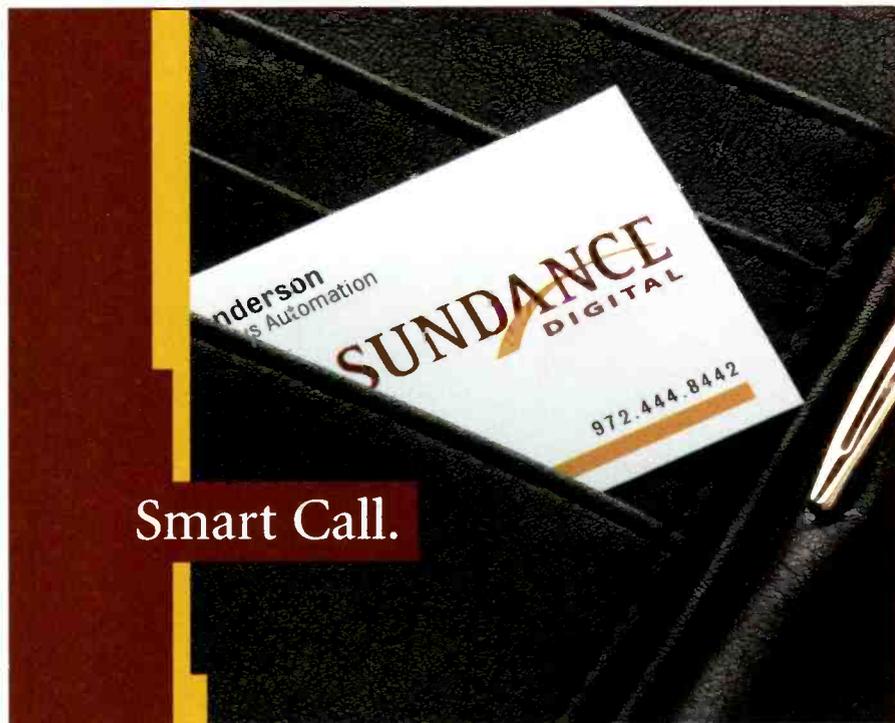
A streamlined, scalable and open-standards digital network environment for news production workflows; gives journalists and producers access to physical and digital media assets; features precision search and retrieval, multichannel cataloging and proxy editing.

818-649-8655; www.konandigital.com

UNCOMPRESSED **HD/SD CAPTURE CARD** **AJA KONA3 version 2**

For Power Mac G5 users, the new version supports 2K resolution video and hardware-based 1080-to-720 or 720-to-1080 crossconversion; directly and simultaneously creates 2K DPX files and 2K QuickTime reference movies; material can be played out at 2K via HSDL; additional features include 16-channel embedded audio and 96kHz AES audio.

800-251-4224; www.aja.com



Smart Call.

With Sundance Digital automation software, good broadcasting also means improved business results — more efficiency, greater accuracy, increased productivity and higher profitability. Now, how smart is that?

The secret lies in managing digital workflow. By integrating digital television and information technologies, our automation software handles the core operations of your broadcast business. This Digital Workflow Management helps you perform the same complex tasks you're already doing. Only with greater speed, more control and unprecedented flexibility.

That not only improves your on-air product, but also your bottom line. Just the kind of thinking that makes Sundance Digital the smartest call in the business.

SUNDANCE
DIGITAL A part of Avid
BROADCAST AUTOMATION SOLUTIONS

www.sundanceigital.com

972.444.8442

7 DAY PLANNER ON YOUR SIDE

Mon	Tue	Wed	Thu	Fri	Sat	Sun
68 59	67 55	73 51	75 49	76 55	Lots of Rain! 74 57	69 53



PEAK WIND
SW-18
RAINFALL
.00"

PANORAMA ELEM
SCHOOL NET

GUTHRIE CO
RURAL ELEM
COOPERAT

PANORA

JUNE 2006

Keeping your live Doppler radar in good operating condition will pay big dividends when storms arrive. Images courtesy Baron Services.

SPECIAL REPORT:

SEVERE

weather systems

BY DAVID STARNES

This is the time of year storm tracking systems become the cornerstone of your weather center. And now is the time to make sure your weather systems are locked and loaded for the stormy days ahead.

Arm yourself with knowledge

While daily weather is an essential element of a well-rounded weather presence, severe weather is when broadcasters' reputations are built and ruined. So stay on top of things. Know what kind of technology is out there.

When shopping, feel free to ask prospective vendors from where their weather data is obtained. Do they generate their own algorithms, or do they rely on slower, less specific technology? Proprietary algorithms can provide more accurate detection of the strongest areas of a storm, as well as a far greater timeliness.

The speed of the weather systems themselves is another crucial element. Select a storm tracker that also serves as a multi-purpose system that can be used for effective year-round weather coverage, not just during severe weather. Recent innovations have resulted in the advent of real-time displays that require no rendering, allowing your weather team to create weather shows quickly and get to air faster.

A renderless system eliminates the multi-box approach, running everything out of a single CPU. Having storm tracking and graphics display capability in one box not only streamlines the technology inside the weather center, but also provides an additional cost savings.

Work as a team

Oftentimes, engineers must work closely with the weather team. This happens often at small stations that are forced to spread resources across multiple departments. During the weeks ramping up to severe weather season, everyone involved should meet to determine the personnel who will be responsible for certain aspects of severe weather — weekend or late night coverage, for example. Knowing the duties beforehand will help prevent confusion once an actual outbreak does occur.

Make sure the weather team has access to the most appropriate NEXRAD sites. We recommend referencing at least four sites — one in the nearest major city, and three others in the nearest outlying areas. You can also ask if your vendor can provide the ability to display multiple live radar feeds in one unified display. Nationwide composites of radar data are also useful, and in the case of some vendors, they are more timely than conventional NEXRAD delivery.

From a community standpoint, have a plan of action. Some storm trackers feature the built-in ability to air digital images submitted by viewers. Work

with the weather team to create a process for requesting, receiving and displaying such viewer-oriented images.

Above all — practice, practice, practice. Work with your weather team to prepare drills.

And finally, formulate a backup plan in case one of your data sources goes down. Weather vendors have redundancy in places that should quickly restart the flow of data in the unlikely event a dropout does occur. Make sure your vendor has the capacity to get you back up quickly. Keep the vendor's customer service number handy, just in case.

Train yourself

We can't emphasize enough the importance of training seminars. Advise your weather staff to attend conferences on as many of your weather products as possible. If you've got some outstanding technical questions that can only be answered in-depth, you may want to consider attending yourself.

Be sure to look for seminars that cover the science behind meteorology and its practical day-to-day applications. After all, it's of little use to see an item of interest on the weather display and not understand its significance.

Tutorial DVDs serve as a supplement to seminars and traditional operations manuals. In many cases, they may prove more beneficial because they allow users to actually see the operations being performed, as well as provide the ability to instantly rewind or skip ahead to other sections.

Optimize the weather systems

Make sure the latest software updates have been made to all your weather systems before severe weather season begins. Reboot the computers and then verify their performance. If you live in a warm climate, you may not have used the instant alert crawl for some time. Run a test to make sure the crawl works properly and that it keys correctly in the display.



The year-round capabilities of Baron Services' VIPIR system make it equally adept at daily weather graphics, storm tracking and localized forecast modeling.

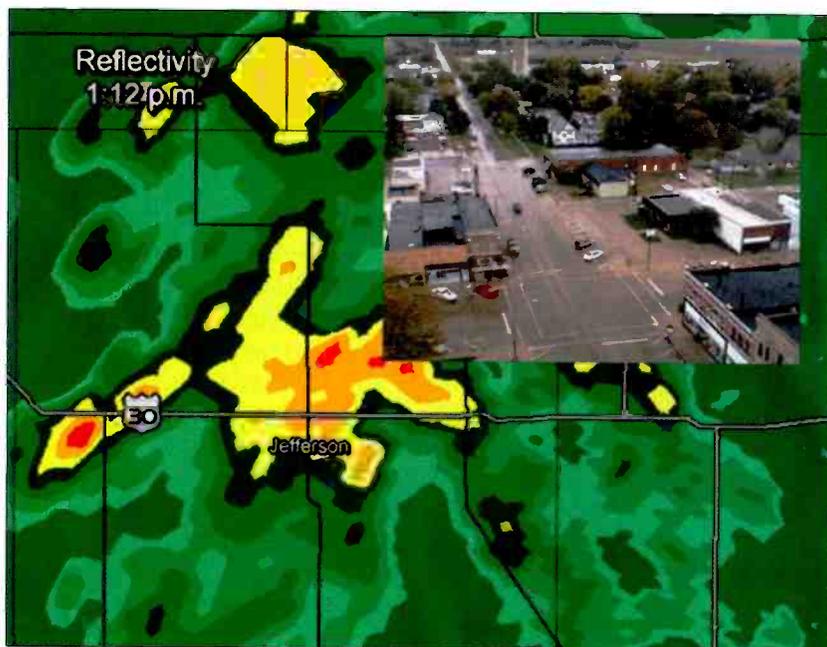
Encourage the weather team to go through highlighted city names in the storm tracker and configure their display range. This way, well-known areas will appear in the wider, zoomed-out views, with small communities becoming visible when the view range gets tighter. Your audience will be more easily able to get their bearings and see how the storm information relates to them.

The color-coded county maps in your alert crawl are especially effective because they deliver one-glance

warning information. Make sure the counties you want to highlight are configured to turn on once an alert comes in. Some storm trackers offer the ability to display county warnings in the mapping. If you have them, make sure these warnings are operational, too.

Reach into the community

Remote weather sensors are a popular way for stations to get their presence felt in the community. But after a long winter, and before the storms



Live camera integration allows Baron's FasTrac storm tracking system to spotlight areas of the community on-air.

SONY

Music makes the movie.

Cinescore makes the music.

NEW

Cinescore: Professional Soundtrack Creation

Cinescore™ software introduces new levels of customization, performance, and accuracy to the world of professional soundtrack creation. Automatically generate an unlimited number of musical compositions using royalty-free Theme Packs in a wide array of popular styles—perfect for movies, slide shows, commercials, and radio productions.

With Cinescore there are no loops to stack or complicated licensing fees to sap your budget. Multiple tracks with functional editing capabilities ensure the most accurate fit for your media, while highly customizable, user-defined settings yield a nearly infinite number of musical choices. Discover the true potential of your video by taking full control over your soundtrack.

www.sony.com/cinescore

like.no.other™

arrive, pay a visit to each of your sensors for a quick inspection.

Check all moving parts, and make sure the connections are dry. Now is a good time to perform any calibrations, as well. Make sure any remote weather cams are in good shape, too.

The value of sensors extends far beyond their visibility and a graphic, of course. Being able to integrate live readings into your weather display gives meteorologists a localized look at conditions during severe weather. Select products in which the readings are shown as an overlay on the mapping display.

Doppler radar is an excellent tool for determining where there may be a tornado. John McLaughlin, chief meteorologist at KCCI-TV in Des Moines, IA, said the addition of live pan/tilt/zoom webcams has allowed his station to actually see a tornado.

Last November, the station tracked a rare, late-fall tornado as it moved into the community of Woodward and destroyed several homes. Many residents sought shelter, not because they saw the radar image of a possible tornado, but because they could see the actual tornado live on television.

With nearly 70 sensors reporting data, there is just too much for a meteorologist to keep track of everything. Therefore, McLaughlin's team coupled its webcams with storm tracking data generated by their Baron FasTrac. When the wind exceeds 50mph or heavy rain begins, the weather stations automatically instant messages the office and say, "Hey, look at me! Something important is going on here!"

As an essential part of your community presence, your storm van also needs to be in good running condition, especially after a hard winter. Schedule any necessary maintenance, and be sure to calibrate any onboard weather sensors. Don't forget to update any onboard software, and verify that the new software version works correctly.

Maximize Doppler radar

Preventative maintenance is the key to making sure your live Dop-



With Baron's Mobile Threat Net mobile tracking system, you can share your radar information with EMAs or give your news vehicles on-board weather data.

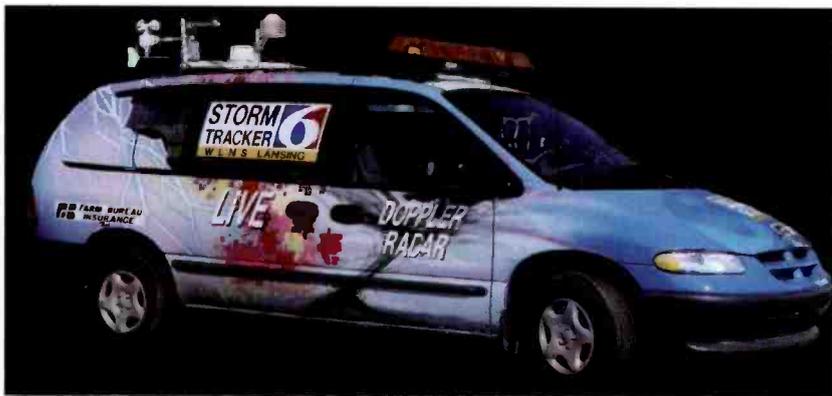
pler radar will perform well through the turbulent weather months. Your radar vendor can perform inspections and maintenance, catching any calibration, sensitivity and waveguide issues, at a minimal cost.

Some stations elect to share their live radar feed with local emergency management agencies. Choose a product that provides EMA offices with a weather analysis system that lets them

effectively use the radar on-air, performing sector scans and the like with ease. If you don't have command and control, ask your vendor how to get it. Changing rotation speeds, range, modes and elevation angles becomes much easier and reduces your number of trips to the radar site.

Reap the benefits

Severe weather season presents nu-



Storm vans go a long way toward establishing your identity in the community, so make sure yours is in good running condition.

storm track and remotely communicate with their spotter networks. If your station has a FasTrac display, they can instantly share information with your weather team.

If you have radar command and control in your weather center, run that through a quick test to make sure the interface is working well. That capability will help meteorologists more

merous challenges to broadcasters, but viewers will note your success. Take the time now to make sure your capabilities are operational. It can alleviate some frustration later on, and when the rewards come in, you can sit back and enjoy a job well done. **BE**

David Starnes is director of sales for Baron Services.

s i m p l e

assembly... durability... **value**

Fastest XLR Assembly in the World!

The AAA XLR Connector

Another first from Switchcraft...the quickest, easy-to-assemble XLR connector available today. The 2-piece construction of the AAA XLR Connector saves time in assembly, and increases your job efficiency.

And second...the all metal, RF shielding body is made with Switchcraft durability.

Put them together and you have a new level of value in critical components!

- Integral strain relief locks cable in shell, while 4 barbs comfortably adjust to cable diameter.
- Exclusive one-piece head with solder pots.
- 2-piece, all-metal, RF shielding construction.
- Available with:
 - 3 to 7 pins, gold or silver plated contacts
 - Black or Nickel finish

Visit www.switchcraft.com/aaa.pdf for detailed information on the new AAA XLR Connector.



Switchcraft

www.switchcraft.com

5555 N. Elston Ave. • Chicago, IL • 60630

ph: 773.792.2700 • fx: 773.792.2129

EGT delivers distributed digital conversion

BY CHRIS GORDON AND SANTHANA KRISHNAMACHARI

The primary goal of digital conversion is to improve the customer experience by increasing the quantity and quality of available programming. A secondary but important objective is to improve the flexibility and cost-effectiveness of the network.

Although a full digital conversion of the last mile is perhaps years away, the core networks connecting regional headends and hubs are transitioning to digital IP networks with centralized operation centers. In a centralized network, nearly all processing is performed centrally and distributed over IP networks with affordable edge decoding supporting the analog tier. Although this architecture has the advantage of centralizing control at a single location, there remains a requirement for distributed encoding and signal processing.

Distributed encoding

Not all content is available at centralized locations. Digital tier program line-ups are comprised of national, local broadcast and local public channels. While national channels are carried by all systems, local broadcast channels originate in different metropolitan areas. Local public channels

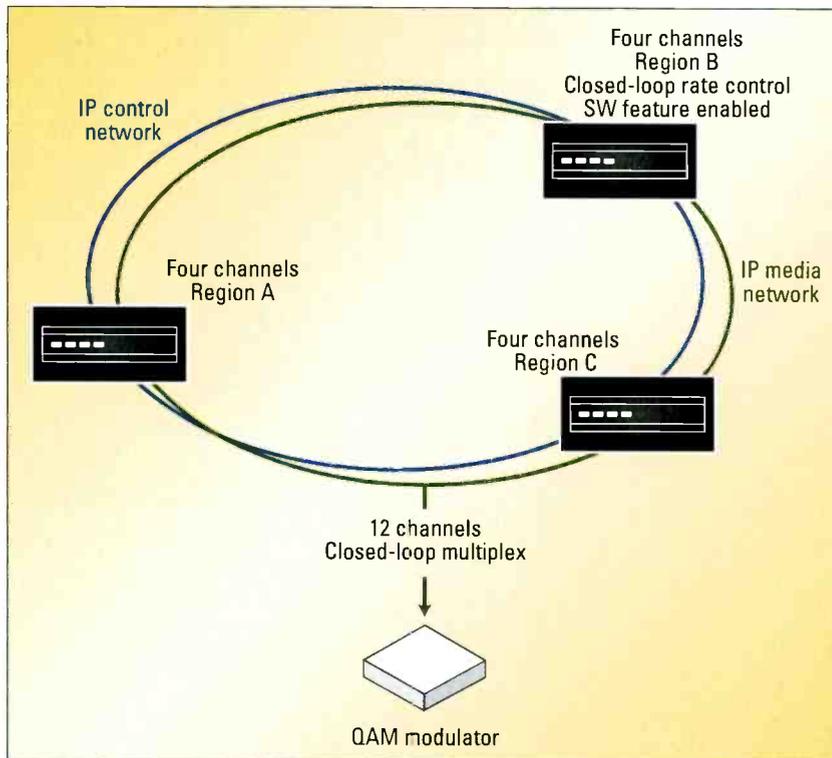


Figure 1. In EGT's distributed closed-loop architecture, the exchange of complexity/bit-rate messages and the output media traffic can be transported over a network.

Distributed encoding can be more bit-efficient. Encoding efficiency, characterized in terms of video quality, depends on many factors. Primary factors are the number of channels in the multiplex and the mix of

Digital ad insertion can also have an impact. Downstream or distributed ad insertion introduces an additional generation of re-encoding that can deteriorate video quality. By using local channels to reduce the number of ad-insertion channels per multiplex, distributed encoding offers additional flexibility for DPI load-balancing. However, the re-encoding issue still exists.

To fully optimize the network for distributed ad insertion, EGT has introduced DPI RateLock. DPI RateLock is a solution to the re-encoding problem that establishes a pre-defined bit rate for the advertising available and incorporates it into the encoding algorithm. Operators are then free to match the bit rate of the stored

Distributed encoding offers complete flexibility for mixing local channels with national channels with different priorities to achieve optimum quality.

have an even narrower viewing area and originate from multiple locations within a single system. This distributed nature of content availability requires that the encoding be distributed too.

channels chosen to form the multiplex. Distributed encoding offers complete flexibility for mixing local channels with national channels with different priorities to achieve optimum quality.

ad to the bit rate available, eliminating the re-encoding requirement and improving the quality and efficiency of the multiplex.

Open-loop vs. closed-loop architectures

There are two primary architectures for distributed encoding: open loop and closed loop. In distributed open-loop architectures, encoders are located in disparate locations and operate in an open-loop CBR or VBR mode. The outputs are transported to the aggregation location, and a statistically multiplexer via rate-shaping.

In open-loop architectures, there are at least two generations of MPEG re-encoding: the first one at the encoder and the second during the rate-shaping operation. This leads to a generational loss in video quality. In this architecture, it is necessary to ensure that the encoders and multiplexers are configured appropriately to minimize this loss.

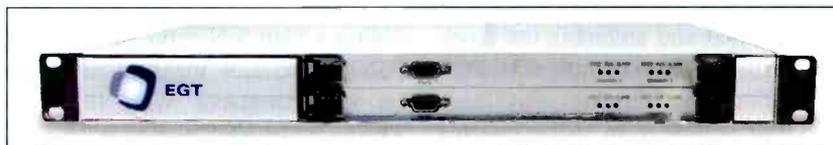
Closed-loop architectures offer the most efficient compression performance and thus maximize the number of channels in a given bandwidth. In the past, closed-loop encoding has been synonymous with collocated encoding. However, EGT has deter-

mined that there is no underlying requirement that the encoders and the controller be collocated. The exchange of complexity/bit-rate messages and the output media traffic can be transported over a high-speed IP network, enabling distributed closed-loop architectures. (See Figure 1.)

EGT has integrated the closed-loop rate control function in the encoder, rather than in a separate piece of hardware. Apart from the obvious cost advantages, this architecture

sion project because of the basic geographic availability of sources, the need for multiplex efficiency and the desire to optimize multiplexes for ad insertion.

Embedded closed-loop control and DPI RateLock are important tools for improving the cost-effectiveness of the video network. However, as networks migrate toward IP distribution, careful consideration must also be paid to the delay, jitter and loss characteristics of the IP network.



This EGT encoder supports up to four channels of high-quality MPEG-2 encoding in 1RU and is configurable with either analog or digital interfaces.

provides flexibility. And the software closed-loop control feature enables simplified network designs, reduced sparing inventory and improved cost-effectiveness of the video network.

Conclusion

Declining costs and increasing capabilities provide new opportunities for centralization. However the need for distributed encoding remains as a prerequisite for any digital conver-

By combining intelligent system design with robust IP distribution infrastructures, operators will improve the efficiency and quality of their programming. They will also dramatically impact the operational efficiency and revenue potential of their systems. **BE**

Chris Gordon is director of product management and Santhana Krishnamachari is vice president of engineering for EGT.

network

SDI to IP Gateway



Network Electronics US
800-420-5909
ussales@network-electronics.com



- SDI over Gigabit Ethernet/IP
- IP protocol in accordance with Pro-MPEG CoP4
- Various Forward Error Correction modes, high QoS
- Built-in frame synchronizer with advanced jitter suppression
- SDTI support
- Transparent to embedded AES audio or other data in the vertical ancillary data space
- Very Low Latency
- Scalable redundancy scheme
- Configurable as transmitter or receiver
- Optional optical Gigabit Ethernet interface with SFP module
- Separated management Ethernet port with in-band management option
- User friendly WEB/XML based remote control
- Easy integration to NMS systems with SNMP support



Simplicity rules

network-electronics.com

Volicon's monitoring and logging solution

BY JULIUS PERL

Video monitoring and logging is an essential function for all TV broadcasters and cable programmers. Most perform this task using traditional analog video recording systems in VHS format and archiving the tapes. Primarily, this is to comply with FCC regulations, to provide advertisers proof of airtime or to satisfy internal archiving needs. Although this system is relatively inexpensive, it takes time, lacks flexibility and is cumbersome.

Volicon has developed Observer, a digital broadcast monitoring system that enables broadcasters and cablecasters to view, monitor and share their own transmissions, as well as competitors' content, from any location using a PC and the Internet. Segments can be recorded and shared instantly via e-mail or URL.

Encoding

Efficient encoding is required to allow storage of captured audio and video for 90 days or more at an ac-

ceptable image quality while maintaining reasonable costs. The Windows Media Video 9 format, based on a modified MPEG-4 standard, was chosen because it offers superior image quality at all bit-rate levels, providing a high S/N ratio (in terms of PSNR, a reliable measure of image quality) compared with MPEG-2. This provides VHS quality at 256Kb/s to 512Kb/s, yielding 45 to 60 days of VHS-quality video storage per channel on a 250GB drive. This bit-rate range is suitable for video streaming over DSL and cable modem.

Storage

For storage, an SATA-based internal hard drive was selected over the SCSI-II standard (the traditional choice). SATA drives are well suited for storing compressed digital video with a price per megabyte at roughly one-third of that for SCSIII.

Combined with the above-mentioned VCI encoding, the use of six 250GB internal drives provides up to 60 days of storage for a four-channel system, including RAID 5 and a hot spare drives. Ninety days is possible with eight 400GB drives.

Once the program is stored, there must be an easy and fast way to access the information. Instant retrieval is possible with a built-in search engine that searches closed-caption text.

Video can also be indexed and retrieved via the date and time of broadcast. Selected content can be "clipped" and sent to other users via the system's streaming server.

Streaming

Transmission control protocol assures firewall support and reliable delivery of the media stream by employing timeouts and retries. The unique use of a

server's storage caching and advanced buffering techniques permits a greater number of simultaneous client connections. The system can support an unlimited number of users, providing efficient transmission of real-time clips. Users can access the video from anywhere with access to the network.

User interface

The system's easy-to-navigate Web page with VCR-style controls enables the user to view single or multiple channels in real time or recorded segments. Users can toggle between windowed, split or full-screen display and move to an actual or relative time-stamp based on the station's clock.

A menu bar offers various options, including Home, Clips, Programs, Preferences and Logout, where users navigate to customize which programs and channels to view and compare on the screen, create clips of segments for e-mailing or to save, and set recording times and time zones. The system's interface is based on the needs of all potential broadcast users, including creative staff, engineering, sales, traffic, engineering and corporate management.

Conclusion

Currently, the FCC has issued a Notice of Proposed Rule Making (FCC MB Docket No. 04-232) that may require the recording and storage of all broadcast programming for a period of 60 to 90 days "for enforcing restrictions on obscene, indecent and profane broadcast programming." Should this rule be adopted, stations and cable systems may be wise in complying with its requirements.

BE



The Discovery Channel uses a 32-channel system for monitoring and logging, with eight Observers (which are located at the bottom of the rack) and one WEB/SQL server (not shown). Photo courtesy of Discovery Channel.

Julius Perl is a founder and vice president of marketing at Volicon.



More than just sophistication.

When it comes to a peerless weather presentation, Baron Services is the absolute leader. No worries, though. While Baron's storm tracking algorithms and forecast modeling are the most accurate and sophisticated on the market, we have designed them to be simple to install. Easy to use. Graphically stunning and lightning fast, so you'll always be ready to break in when severe weather breaks out. Setup woes? No way. Our experienced staff takes care of installation and can provide complete on-site training. We've even turned customer service into an advanced technology. Funny how Baron's sophistication is the very thing that makes your job so easy.

Expect more. Demand more. Get more.

The Only Complete Weather Company


BARON
Weather Solutions


BAMS
BARON ADVANCED METEOROLOGICAL SYSTEMS

W/xWorx


BARON
RADAR

Call 256-881-8811 for an analysis.
Find out how much money Baron can save your station.
www.baronservices.com

Transporting SDI and HD-SDI with MRV Communications' SFP

BY SERGIU ROTENSTEIN

As high-definition television production increases, so does the demand for transporting SDI and HD-SDI signals across long distances. With transmission distances over coaxial cable limited to several hundred yards, fiber-optic transport seems the natural solution. However, the ability to use fiber-optic networks for SDI transmission is difficult and expensive due to the interface's data-scrambling algorithm.

A patent-pending small form-factor pluggable (SFP) solution from MRV Communications solves the problem. It enables the transport of SDI and HD-SDI signals using off-the-shelf optical transceivers — transforming any optical transport system into one fluent in SDI and HD-SDI.

The challenge of transmitting SDI over fiber

SDI employs a data-scrambling algorithm that may produce a pathological signal pattern — one that contains long strings (up to 20) of either zero or one bits — that is incompatible with the optical transceivers used in standard optical transport systems. The result? Broadcasting facilities have to build separate fiber-optic networks using equipment specifically designed for SDI.

The scrambling algorithm specified in the SMPTE 259M standard for transporting SDI signals over coaxial cable is meant to provide a balanced sequence of zeros and ones similar to telecom protocols. It is this balance of signal level transitions that allows a receiver to recover the clock and data. Once the receiver has captured the SDI signal, the decoder reverses the

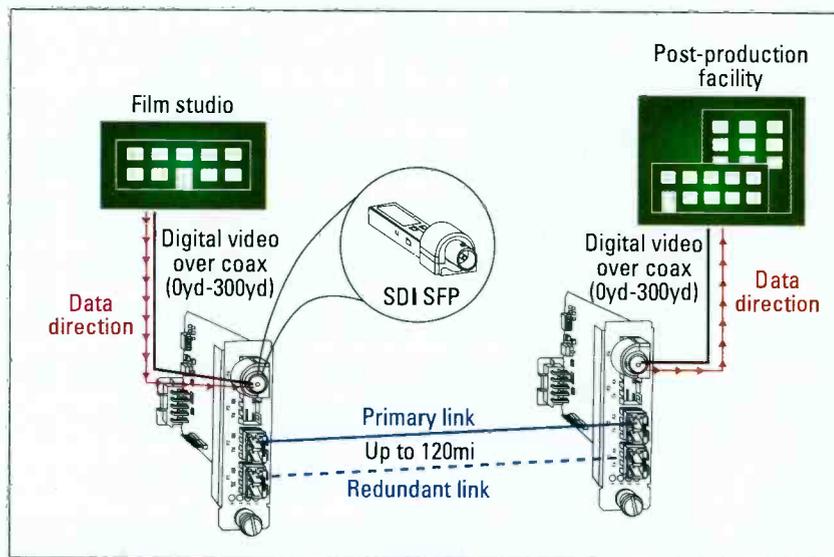


Figure 1. Shown here is a diagram of the MRV SFP workflow.

encoding process to recover the original video data.

This scrambling scheme is dependent on the level of correlation between successive bytes of information. There is no correlation between two successive data bytes in standard telecom protocols. However, SDI data has a high probability of a pattern being repeated again and again over an entire line-by-line picture frame scan. The SMPTE 259M scrambling algorithms do not compensate for such highly correlated data streams. The result is a signal pattern with long sequences of zero or one bits.

SDI and HD-SDI pathological patterns adversely affect two components of a standard optical transport system: the optical transceiver and the CDR of the transponder. A typical optical transceiver requires that the data signal transmitted to the laser diode be DC-balanced or that it has frequent transitions between

high (a digital "one") and low (zero) levels. As pathological waveforms are not DC-balanced, they negatively impact the signal-to-noise ratio and the transmission bit-error rate. Secondary effects include transmitter over-modulation, which causes intersymbol interference, and waveform distortion, which will prevent the receiver from locking onto the incoming signal.

Transponders employ rate-programmable CDR circuitry. Generally, used CDR components expect an DC-balanced signal with enough transitions to allow them to determine the clocking frequency of the incoming data signal. Pathological waveforms prevent the standard CDR from being able to perform this function. What is needed to bridge this technological gap is a solution that compensates for the pathological patterns of SDI while remaining compatible with a broad range of optical systems.

The flexible SDI SFP solution

A new solution from MRV uses the EG 34 recommendation (created by the SMPTE 259M standards body), which defines a method of selectively re-scrambling the SDI signal to create a fully DC-balanced sequence that has no pathological patterns. The process does not affect the quality of the SDI video signal as the receiver decodes and fully recovers the original information. MRV offers this capability in an SFP module. The SFP standard is an industry specification for pluggable, hot-swappable transceivers for data, voice, storage and video optical transport applications. It provides a common framework for systems manufacturers, system integrators and suppliers of SFPs.

The transceiver is comprised of a unidirectional encoding receiver and a decoding transmitter. (See Figure 1.) Plugged into an optical transport system, the encoding SFP accepts the digital video signal from the source device and rescrambles it. The now DC-balanced signal is passed off to the optical transport system, which transmits it out onto the fiber-optic network. At the other end, the process is reversed with the decoding SDI SFP transmitting an uncompromised SDI or HD-SDI signal.

The whole process remains transparent to the SDI devices, the optical transport systems and the user. An SFP-enabled optical transport system or device (transponder, converter, physical-layer switch, WDM, OADM,

sion multiplexing or optical add/drop multiplexing networks, or even across a free-space optics link.

The SFPs permit the digital video optical signal to be repeated, using available rate-specific or multi-rate

The SFP standard is an industry specification for pluggable, hot-swappable transceivers for data, voice, storage and video optical transport applications.

etc.) can seamlessly carry the digital video in a similar manner to a regular telecom protocol. And because the SFP is interchangeable, any upgrades to accommodate changes to the optical requirements of a particular SDI application can be accomplished without a swap out of the whole transponder or system. A simple swap of the optical SFP will do the job, saving both time and money.

The optical transport solution can also be used in a remarkably wide range of network applications. Once converted to a light pulse, the SDI or HD-SDI signal can be sent throughout a building or across the country via a dedicated or carrier-owned long-distance fiber-optic plant. It can also be used in existing wave divi-

peaters and transponders. They are also available in dual-speed SDI and HD-SDI coax that cover both common uncompressed digital video protocols in a single solution. With rate auto-sense and advanced performance monitoring (CRC and EDH error handling), the SFP opens the market of uncompressed digital video beyond a small, closed-vendor community.

This new solution allows the use of standard optical systems and components to transmit SDI and HD-SDI signals outside of the broadcast studio, lowering deployment costs and increasing deployment options. **BE**

Sergiu Rotenstein is vice president of MRV Communications.

HD without Compromise

WASHINGTON LONDON

A single Clear Channel supports dual program feeds

Windows and Linux are viewed as equal by OS

PixelPower

broadcast graphics solutions

www.pixelpower.com

KWTV moves to digital archives with Telestream's MAPreview

BY RANDY CASSIMUS

Scrambling for tapes used to be common practice at Griffin Communications' KWTV, the CBS affiliate and only locally-owned station in the Oklahoma City market. The station recorded all programming onto VHS tapes, which involved multiple VHS tape machines going nonstop, 24 hours a day.

In addition, all newcasts were recorded onto Beta machines. This required a great deal of machine maintenance, tape handling and space to

hold the tapes. Ad-run verification alone was a time-consuming, labor-intensive effort that involved many people. When an account executive called, we had to scour our shelves to locate the appropriate air-check

tape, load and queue the eight-hour recording down to the commercial in question, view it, and dub a copy to send to the client.

This exercise cost us thousands of dollars in tape machines, mainte-

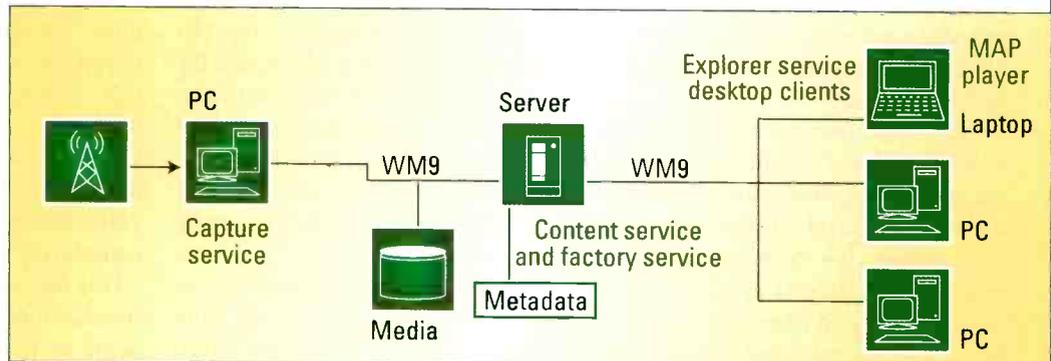
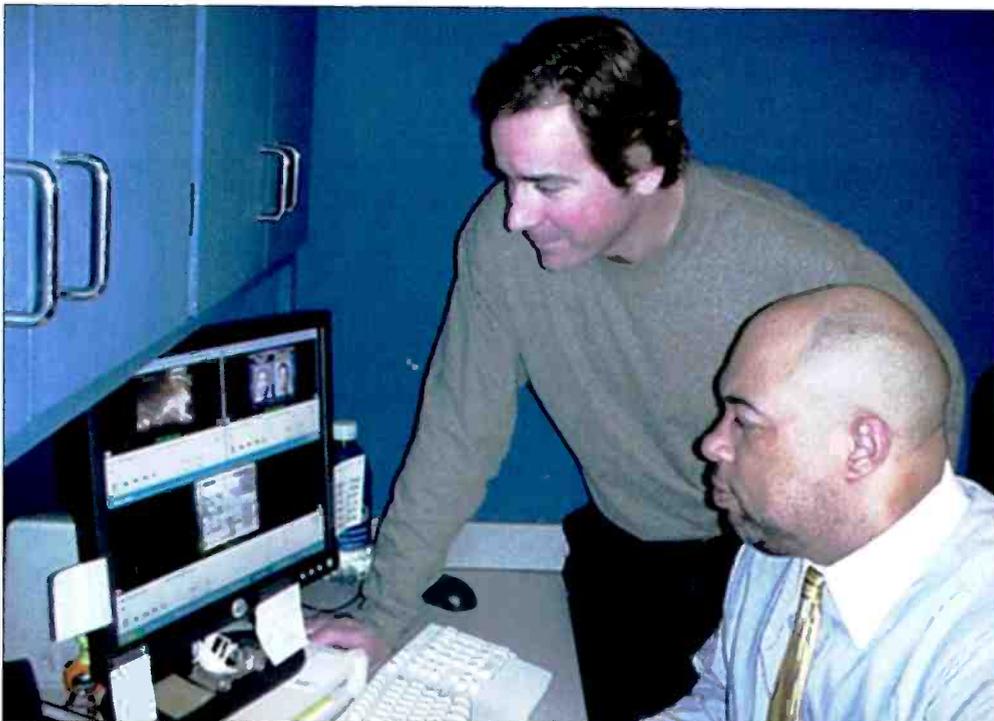


Figure 1. MAPreview automatically records multiple video feeds and captures metadata during ingest. Media are encoded and stored using the Windows Media 9 Series.



Randy Cassimus, KWTV director of production, and Blaise Labbe, news director, review three newcasts simultaneously using Telestream's MAPreview.

nance and tapes, as well as hundreds of square feet of shelf space. The station decided it was time to replace our massive tape-based archives and processes with a more efficient file-based digital archiving solution.

The solution

In April 2005, we purchased and installed the Telestream MAPreview digital video capture and logging system. The system offered just the solution we needed. Installation of the software and RAID drives and training led by

Telestream applications engineer David Piazzese took two days and went very smoothly.

The system is a server-based application that provides automatic multi-feed media recording, simple organization and easy-to-use desktop PC viewing. Metadata such as closed captioning, timecode, keyframes and as-run logs are captured during ingest, and custom metadata labels can be added. These important metadata enable efficient searching of media. We have even programmed our system to automatically display ratings data with the video every quarter-hour. MAPreview definitely makes our operation much more efficient, and it has been an important step in our migration to digital technology.

Using the new system, we now capture and archive all programming in a Windows Media 9 format onto MAP media capture servers. (See Figure 1.) The files are segmented hourly and are held for nine months for compliance with possible BMI and ASCAP audits, ad-run verification, program analysis and executive review.

We also use the system to capture and archive our competitors' programming 24 hours a day. Competitor files are held for one month and used by the marketing and news departments for strategic purposes. In addition, newscast blocks are archived in higher resolution formats for marketing use and

One of our favorite features is the ability to call up files, trim out clips from the recordings and e-mail them.

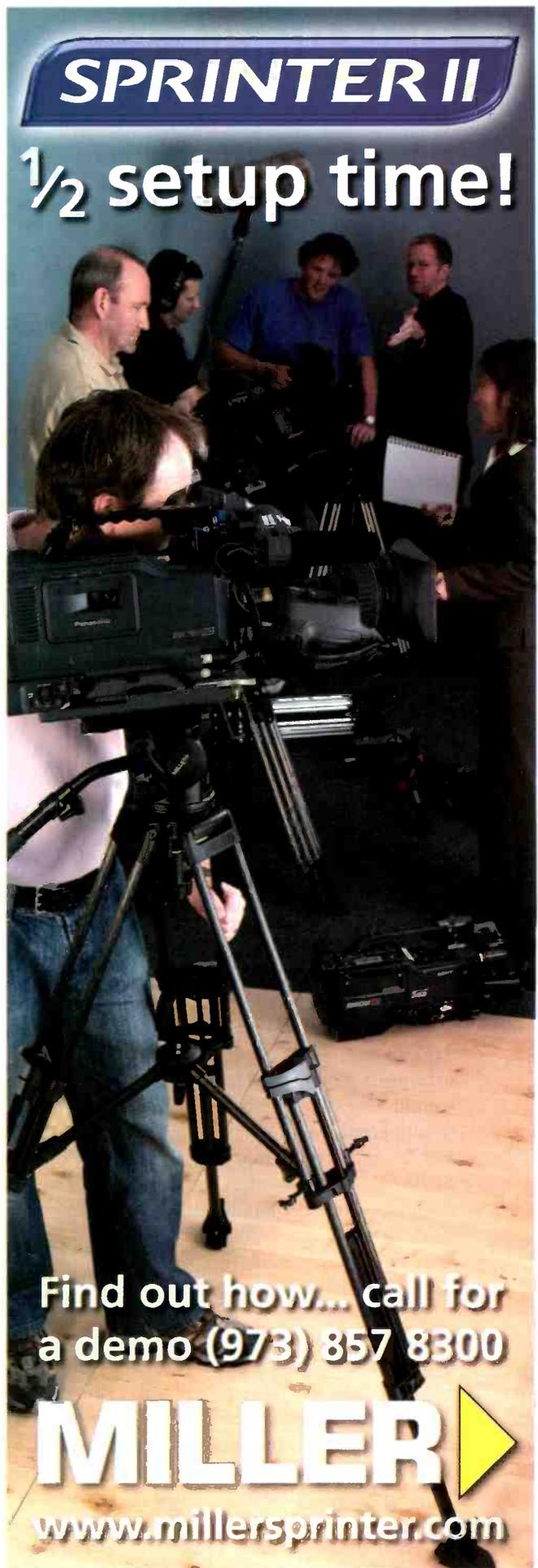
awards submission. All material is stored on RAID-arrayed LaCie drives, which total about 3.6TB of usable space.

With the new system, it's easy to organize media files and set up folders that execute intelligent tasks. Media files can be dragged, or saved from an editing application, to pre-configured folders, where tasks such as indexing, transcoding and delivery to other devices or network folders are automatically executed. The system features auto-archiving of media files onto DVD, CD or networked storage, while keeping metadata online for searching purposes.

The system also allows us to pull up our newscasts alongside our competitors' and watch all three shows simultaneously on our desktop PCs.

One of our favorite features is the ability to call up files, trim out clips from the recordings and e-mail them. For instance, remember the ad-verification scenario I mentioned earlier? Today, the account executive logs onto the system from her PC, calls up the timeframe, locates the spot, trims it out and e-mails it as a Windows Media file to the client. The production department phone never rings! **BE**

Randy Cassimus is director of production for KWTV, Oklahoma City, OK.



SPRINTER II

1/2 setup time!

Find out how... call for a demo (973) 857 8300

MILLER ▶

www.millersprinter.com

Popwire's Compression Master 4.0 Mac OS X-based encoder

BY STEVE MULLEN

When I first encountered Popwire's Compression Master Mac OS X-based encoder, I assumed it was simply an alternative to Apple's Compressor that offered more advanced "expert" settings. Once I started working with the encoder, I realized that in addition to performing typical post-production compression tasks, the application has the functions nec-

essary to act as a universal standards converter. Popwire has packed the encoder with several features that support today's diverse media. These include:

- the generation of iPod A/V;
- multi-bit-rate (MBR) streaming (multiple encoder settings for bitrate and frame-rate that support — in a single encoded file — users with low-, medium- and high-bandwidth connections);
- hinted streaming; and
- metadata support.



Figure 1. 720p 8-bit uncompressed



Figure 2. MPEG-4 H.264 at 7Mb/s



Figure 3. 2-pass WM9 at 7Mb/s

essary to act as a universal standards converter.

Popwire has packed the encoder with several features that support today's diverse media. These include:

- the generation of iPod A/V;
- multi-bit-rate (MBR) streaming (multiple encoder settings for bitrate and frame-rate that support — in a single encoded file — users with low-, medium- and high-bandwidth connections);
- hinted streaming; and
- metadata support.

The encoder has a good selection of audio filters (balance, channels, fade, five-band equalizer, high pass/low pass, sample rate and volume filters). Floating-point math is used to avoid rounding errors. Video filters include: burn timecode, black and white restoration, contrast, fade, gamma, HSV levels, RGB filter, sharpen, smoothing, watermark,

Compression tasks

Compression Master is a standalone application and not a Final Cut Pro (FCP) plug-in. A plug-in provides both the simplicity of compression control from within an application

plus the advantage of not requiring the export of a movie. However, when you manually perform a QuickTime Movie export, you avoid the possibility of FCP using erroneous auto-settings.

When working with SD, you may export a DV/DVCPRO or a DVCPRO50

pressed input is not universally supported by the encoder, the optimal HD and SD solution is to export from FCP using Apple's 8-bit, 4:2:2 uncompressed codec. You do not need a RAID because you will not need to playback this movie.

When you use the encoding system as an alternative to Compressor, you begin by selecting your export movie. For my testing, this movie was an

8-bit, 1280 x 720, 29.97fps, 4:2:2 uncompressed file. (See Figure 1.)

Because Compression Master's Source Bookmarks folder is, by default, linked to the OS X Movies folder, if you export from FCP to the Movies folder, you can easily locate your file. Simply drag your movie

In addition to performing typical post-production tasks, the application has the functions necessary to act as a universal standards converter.

movie. (The latter is the optimum choice.) When working with HD, you should be able to work with QuickTime Reference movies. However, in my test of Reference movies, only the first frame of a Reference movie was compressed. Because 10-bit uncom-

pressed input is not universally supported by the encoder, the optimal HD and SD solution is to export from FCP using Apple's 8-bit, 4:2:2 uncompressed codec. You do not need a RAID because you will not need to playback this movie.

When you use the encoding system as an alternative to Compressor, you begin by selecting your export movie. For my testing, this movie was an 8-bit, 1280 x 720, 29.97fps, 4:2:2 uncompressed file. (See Figure 1.)

To use any of the dozens of presets, open the Compression Settings folder and choose the preset you need. Now drag a preset over an input file. Of course, the system allows you to drag multiple presets to an input file to create a multi-codec batch job.

For my first test, I dragged an MPEG-4, H.264 preset to my test movie. The encoder supports AVC Baseline, Mainline and High Profiles. The former two profiles support a 4:2:0 colorspace, whereas the latter profile also supports 4:2:2. Because Apple's QuickTime player does not support High Profile, I used the Mainline Profile at 7Mb/s.

Next, I clicked the Start Encoding button to begin the compression process. When compression is complete, you can play your movie, using the QuickTime Player, from within the encoder. (See Figure 2.)

Figure 3 is from a 7Mb/s, 720p HD, WM9 movie generated using a two-pass VBR peak constrained setting. Although the application has a preview function, it displays the source file or the result of applied video filters. Therefore, the lower quality of the WM9 movie was not apparent until after the encode. It would be useful if the encoder were to provide the ability to encode one GOP, or one second, of video to a RAM buffer for playback. Now one would be able to more accurately set encoding parameters.

Transcoding tasks

Video, especially HD video, is increasingly being shot at 24fps for a "film look" and/or for transfer to film. In doing so, you will likely encounter situations where 2:3:2:3 pulldown or 2:3:2:3 inverse pulldown must be applied. The encoder's frame-rate filter offers both "Telecine (23.98 => 29.97)" and "Inv. Telecine (29.97 => 23.98)" functions. Cadence detection is automatic, and cadence changes within a file are properly handled.

Although 2:3:2:3 pulldown is typically employed, 2:3:3:2 is also widely used. Unfortunately, you cannot cre-

ate a custom setting because there is no way to specify a different cadence. The filter's pulldown list needs a "Custom cadence ..." option or the option to use a 2:3:3:2 cadence.

The encoder also needs the ability to place Repeat flags within an MPEG-2 stream in order to effect

2:3:2:3 (24p carried by 60p) or 1:2 (30p carried by 60p) pulldown as well as inverse pulldown.

Because HD production is more common in the United States than in other parts of the world, Region 60 HD productions must often be converted to PAL. This task can also be



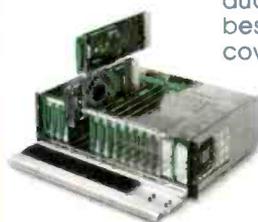
Your HD infrastructure is in reach

with Vistek from Pro-Bel

If you're worried about how to implement HD in your facility - **STOP!** The Vistek range from Pro-Bel has everything you need.

The most advanced up, down and standards converters in the industry, synchronizers, DA's, audio processors, multiplexers and lots more besides, if you need HD (or SD) we've got it covered. **So relax**, reach for your mouse, click on pro-bel.com and contact your regional Pro-Bel representative.

HD is at your fingertips.



Automation
Master Control
• Modular Infrastructure
Routing
Control & Monitoring



www.pro-bel.com

Engineering The Broadcast Future

done using the frame-rate filter. To test the conversion process, I chose the "NTSC => PAL (29.97 => 25)" option. (I would like to see the terms NTSC and PAL replaced, where ap-

fine the output image size as "PAL 720 x 576." The filter's "Maintain Aspect Ratio by" (better understood as "New Aspect Ratio by") dropdown determined how the image would be

When using the Resize filter, you have several options: Automatic, Bilinear, Bicubic, and Nearest Neighbor scaling. After processing, using the Bilinear option, I had three PAL movies.



Figure 4. Letterbox PAL DV



Figure 5. Center-cut PAL DV



Figure 6. Anamorphic PAL DV

propriate, by the more HD friendly terms — Region 60 and Region 50.) I added three Region 50 frame-rate presets to my uncompressed movie.

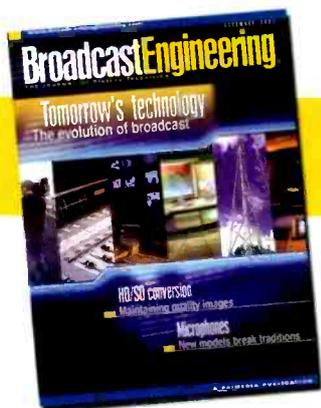
Now I used the resize filter to de-

resized in my test. The first movie received the "Letterbox — Pad" option; the second, the (Center) "Cut" option; and the third, the "None — Distort" option for anamorphic.

(See Figures 4, 5 and 6.)

A full set of ATSC SD sizes is not available on the Resize filter's pull-down list. You can, however, create a custom size if you need one.

TRUST



SUBSCRIBE

to the **Trusted Technology Leader**
and **Stay on Top of the Industry!**

For over 45 years, readers have learned to **TRUST**
Broadcast Engineering editors to bring them timely, reliable
and indispensable technical information.

You can **TRUST** *Broadcast Engineering* to deliver the best: It is ranked #1 most authoritative global source of technology information in the industry.*

Stay on top of the latest technology developments, new players, products & decision-makers.

SUBSCRIBE to *Broadcast Engineering*.

To start your **FREE** subscription, go to www.broadcastengineering.com
and click on **SUBSCRIBE NOW**.

*2003 Paramount Research Study



Celebrating 45 years
as the Technology Leader.

TRUSTED, Technology Industry Leader

In an NTSC and PAL world, deinterlacing typically needs to be done only when transcoding video for computer use. However, powerful deinterlacing is required whenever NTSC, PAL or 1080i are used in a 720p, 1080p or

all the methods as well as specify how many times each method is executed.

Output options

Compression Master supports a wide range of formats and codecs for

minimal: G4 or better with 1GB RAM. The recommended hardware configuration is a dual 2GHz G5 PowerMac. You need to be running Mac OS X, version 10.4 or better, plus QuickTime version 7 or better. Version 4.0 is shipped as a Universal Application, so it can also be run on Intel-based Macs.

Other than the problem with QT Reference movies, V4.0 was rock-solid over many weeks of testing. Popwire's manual provides uneven coverage of the application. While the manual documents each function, it provides little in the way of guidance to the user. However, Popwire plans to add more information to the next version's manual.

BE

Steve Mullen is owner of Digital Video Consulting, which provides consulting and conducts seminars on digital video technology.

The encoder has a powerful deinterlace filter that provides a large selection of operating modes.

film production. The encoder has a powerful deinterlace filter that provides a large selection of operating modes.

When employing legacy video in HD productions, removing noise is a critical need. The encoder provides a noise reduction filter that supports three techniques: median, average and temporal. It enables you to combine

output. The QuickTime Preset provides the ability to select most, but not all, QuickTime codecs. For example, you cannot select Apple's native HDV codecs. Popwire may, however, enable HDV codecs in a release that should be available by the time you read this.

I found the encoder to be very fast on a dual G5 and quite fast on a G4 iBook. Its system requirements are

The Clock is Running Out!

Make Your Move to DTV With An ERI Broadcast System

ELECTRONICS RESEARCH, INC. ERI

Call 877 ERI-LINE • Visit www.eriinc.com

The advertisement features a blue background with a silhouette of a hand moving a chess piece. In the top left, there is a yellow clock. At the bottom, four circular inset images show various broadcast equipment: a tower antenna, a camera lens, a control panel, and a building with a tower.

Monitor walls

BY JOHN LUFF

Most of the technology we work with on a daily basis has changed in subtle ways over the last several decades. VTRs evolved from analog recording, to analog inputs on digital recorders, to digital inputs on digital recorders — but they still do the same job. Similarly, cameras still have lenses on the front and output analog and digital signals. However, our methods of monitoring have undergone fundamental change in the last five years. Monitoring has transformed from unitary monitors that were universally CRT-based to monitor processors outputting to inherently digital devices.

The first monitor processors appeared more than 10 years ago, not long after digital video effects became more affordable. As scaling hardware became more available and moved into consumer televisions, the professional side of the industry began looking for ways to use some of the same tools.

Today, the rich tool set available allows the design of monitoring environments, which are both flexible and can be made to adapt to changes in the signals they monitor. This has permitted several hardware manufacturers to develop new and exciting aspects to what was fundamentally a boring part of technology.

Display processor features

All multi-image display processors feature scaling engines, which adjust images in size and position, with few

boundaries. They scale the images to fit many output formats, commonly matching computer interfaces at the output today. This has been a major force in the switch from dedicated

CRT displays to flat-panel LCD and plasma displays. Of course, there are limitations — primarily those related to quality issues. In the future, both displays and image processors must

Display processor functions

Today's best display processors perform a number of functions. First, they scale images to fit the output format and adjust size as appropriate and

Our methods of monitoring have undergone fundamental change in the last five years.

desired. They also allow many images to be combined into one output and insert borders and backgrounds to make the output pleasing and more relevant. In addition, they may offer



The monitor walls at Turner Studios' PCR-22 studio production control room feature Evertz MVP video processors that feed NEC color LCD displays. Photo courtesy AZCAR.

be able to replicate the resolution and colorimetry that a good CRT offers. Although at one time there was little focus on this important aspect, today many companies are developing products for such critical monitoring applications.

features that go way beyond display preparation.

One additional feature often incorporated is multiple level tally inputs. These may be triggered by simple GPI closures or may offer data connections to production switchers, routers and





Total visual provider for broadcast applications

Barco provides innovative visualization and display solutions for broadcast applications such as outdoor marquee, indoor lobby, TV show studio, news studio, broadcast and distribution monitoring room, screening or training room and post production. Barco's commitment to this exciting market, its continuous high-quality R&D effort and proven flexibility towards customers' needs offer the best guarantee for your future-proof investments.

Barco Visual Solutions LLC, USA
3059 Premiere Parkway
Duluth, Georgia 30097-4905
Phone: +1 678 475 8000
Fax: +1 678 475 8100
Email: sales.controlrooms@barco.com

BARCO

Visibly yours

www.barcocontrolrooms.com

external tally processors. In many applications, this is a critical path capability. When a display monitors many sources in flexible ways, the tallies must by definition be done in the same manner before they are passed on to the display device. Although most CRT monitors did not have multiple level tally inputs, in today's production environment, it is almost a requirement that multiple levels be supported.

Signal-monitoring capabilities

With tallies, the processor often adds other ancillary data to the display of each input. This may include multiple-level audio metering, closed-caption and ratings displays. Some products, however, have added a critical signal-monitoring capability that no CRT ever offered. This can take the form of simple signal loss (audio or video), full monitoring of captioning and other inserted data, as well as levels and other more detailed parameters.

This information can be passed to the output in a number of ways. Alarms and signal monitoring can be added to the individual displays or passed to external computer monitoring to allow interaction with control systems, which need to be aware of signal status. This can lead to some interesting capabilities. For instance, Turner Entertainment uses this signal-monitoring capability as part of an automated program ingest system. When alarms are recorded for programs during unattended ingest, the data is written in a log by the automation system, which allows unattended ingest to proceed with operators checking only those sections with technical issues identified by the monitoring system. The savings in labor and efficiency are obvious.

Consider another perhaps more interesting application. By allowing the monitoring output to change when errors are found in a signal, one can give an operator more immediate access to the most critical information needed at any time. In master control, when a primary signal causes an alarm, the

system might bring the failed signal to full screen for the operator to decide if the failure is sensitive to air or not. When a station or network operations center is controlling many outputs, this allows the operator to concentrate on potential problems and spend less time scanning a wall of signals that are likely to be OK.

Large CRT monitor walls are often constructed with routing switchers or patching on the inputs of the monitors to allow display flexibility. Monitor processing engines (almost) universally allow that capability internally. They can often display 16 or more signals from a set of available inputs that is perhaps several times that many.

Large monitor wall processors allow further routing capability, with the ability to move complex outputs designed by the operator to other monitors. This also allows the duplication of a complex display in more than one place on a monitor wall for the convenience of other production personnel. In one IPTV facility, each operator can have access to each composite output. This allows supervisory positions to look over the shoulder of operators without having to get out of their chairs as often.

Conclusion

The future development of monitor processing systems could lead to many new applications. Although current designs do not allow transitions like DVE moves, if a future processor allowed that kind of capability, it would serve well for feeding some stadium spectator displays. Other public venues could benefit from the same capability. Automation of the placement and movement of individual displays, and even compositing of data and images, would create powerful new uses in broadcast and other applications.

BE

John Luff is the senior vice president of business development for AZCAR.



Send questions and comments to:
john_luff@prismb2b.com

THE LEADERS IN ON-SITE
AVID & FINAL CUT PRO HD
RENTALS / SUPPORT
FOR OVER A DECADE



prime to go
avid broadcast

Superbowl • Final Four • PGA
Olympics • Miss America • NBA
Horse Racing • Reality TV

Providing

- Entire AVID Product Line
- Fully Redundant Unity Systems
- Mobile Truck Integration
- Technical Support Contracts

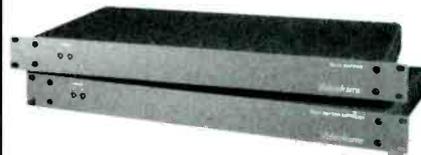
Clients

- Major Networks
- Post Facilities
- Production Companies
- Corporations

PRIME TO GO
The Portable Post Production People
Toll Free 888-858-4180
www.primetogo.com

TALLY MAPPER™

- ◆ Tally Routing & Mapping
- ◆ One Button Operation
- ◆ Store Maps Internally
- ◆ Edit From a PC/Laptop



A Compact Solution,
Ideal for Mobile Units and
Multiple Production Setups.

Videoframe™

Control System Solutions

Tel: 530-477-2000

www.videoframesystems.com

▼ Low Profile DVB-ASI PCI I/O



DVB



DVB Master LP FD™

- Transmitter and receiver on one low profile PCI card
- Black burst sync input
- Accurate clock
- Jitter management
- Packet arrival time stamping
- Unlimited PID filtering

For more information on DVB Master LP FD, please call **858-613-1818**, or visit www.dveo.com.

Systems ▼ PCI Cards ■ Software



Time Code
Hassles

TCP-50 \$499



"Universal"
Time Code
Processor

- Translates between 23.976, 24, 25, 29.97, and 30 fps time codes.
- Adds +/- offset to TC out from TC in.
- Error analyzer detects and displays six common time code errors.
- "Auto" or manual setup modes.

Unconditionally Guaranteed!

HORITA

www.horita.com
(949) 489-0240

BROADCAST ENGINEERING IS AIMED AT THE MARKET THAT INCLUDES CORPORATE MANAGEMENT, ENGINEERS/TECHNICIANS AND OTHER MANAGEMENT PERSONNEL AT COMMERCIAL AND PUBLIC TV STATIONS, POST-PRODUCTION AND RECORDING STUDIOS, BROADCAST NETWORKS, CABLE, TELEPHONE AND SATELLITE PRODUCTION CENTERS AND NETWORKS.

**TO REACH INDUSTRY
PROFESSIONALS,
PLACE YOUR AD TODAY!**

SUSAN SCHAEFER

P 484.478.0154

F 484.478.0179

SSCHAEFER@PRISMB2B.COM

TTR BAYSAVER HD 4x1 HD/SD ROUTING MATRIX



The TTR BAYSAVER HD is a four input stand alone HD/SD routing matrix housed in a self contained small 180 x 190 x 40mm box. The standard unit comes with four Looping inputs, dual outputs and a local control panel. There is an optional RS232C control module available if required. The BAYSAVER HD has been designed to full SMPTE 292M, SMPTE 344M and SMPTE 259M specifications, and switches in the vertical interval but will switch immediately if no reference signal is present. This unit employs automatic sample rate detection on the input equalizers allowing a mixture of

HD / SD signals in the same unit. Front panel LED's indicate signal presence and control activity.

- Broadcast specification
- Full 1.5Gb/s bandwidth to handle uncompressed HD signals
- Looping equalized inputs as standard
- Vertical interval switching
- Dual outputs as standard
- Automatic sample rate detection on the inputs
- Re-clocked output

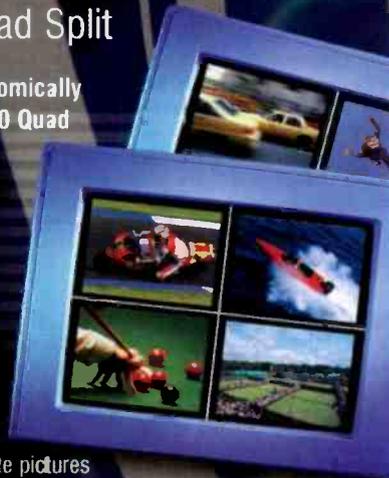
TTR

www.ttr.co.uk or email: sales@ttr.co.uk
84 Bridge Road · Chertsey · Surrey · KT16 8LA
Tel: +44 (0)1932 564063 · Fax: +44 (0)1932 772824

Quad with ARC!

SDI4000 Quad Split

Compact and economically priced, the SDI4000 Quad Split provides four complete video pictures on one or two monitors with aspect ratio conversion for each input.



Displays four complete pictures on one SDI monitor or Plasma screen

On screen idents and 'on air' cue

Bullerred SDI output per channel

525/625 Operation

Aspect Ratio Converter on each input

SHOOTVIEW

Shootview Ltd

87 Cadbury Road · Sunbury
Middlesex · TW16 7LS

Tel: +44 (0) 1932 782823

Fax: +44 (0) 1932 772824

Email: sales@shootview.com · Web: www.shootview.com

Help Wanted

POSITIONS AVAILABLE

Front Porch Digital, the global leader in broadcast archive management, is seeking to fill several key positions to help the company meet the growing demand for its products and services.

Sales Engineering: The Company seeks to add two experienced sales engineers to its team headquartered in Boulder, Colorado. The ideal candidates will be able to demonstrate the following qualities:

- Four years experience in the design and sales of digital file based workflow solutions
- Experience with archive management, asset management / automation systems
- Overall system solution design skills based in broadcast storage infrastructures
- Strong written and verbal communications skills
- Positive references from previous customer engagements
- Though not a requirement, fluency in Spanish is desired

Systems Engineer: Front Porch Digital seeks to add an experienced System Engineer in our Mt. Laurel, NJ development facility. The successful candidate will be responsible for defining and executing system-engineering for all Company product lines. Experience within the digital broadcast environment is desired but not essential. The successful candidate must meet the following qualifications:

- Must have six years experience in system engineering responsibilities in a technical environment such as software, telecom, or product development.
- BS engineering, computer science, or equivalent
- System or project management in a technical environment
- Strong product documentation skills
- Good verbal / written communication skills
- Entrepreneurial attitude with an ability to multitask

As a rapidly growing company with worldwide operations, Front Porch Digital offers qualified candidates an exciting work environment with long-term career prospects. For consideration, please submit your resume, cover letter and salary requirements to: kkonecne@incentrasolutions.com

CHIEF ENGINEER

WAJI & WLDE have an immediate opening for a Chief Engineer. Ideal candidate would hold an electronic degree, have FCC license and SBE certification. Minimum two years supervisory broadcast position required. Knowledge of Audio Vault, Marketron and IT administration a plus. Send Resume to: C. Wendling, WAJI & WLDE, 347 W. Berry St., Suite 417 Fort Wayne, IN 46802 E.O.E. M/F

Certification

Are your engineers
Certified?

SBE Certification
The Industry Benchmark
www.sbe.org • (317) 846-9000

For Sale

AcousticsFirst™
Toll-Free Number: **888-765-2900**
Full product line for sound control and noise elimination.
Web: <http://www.acousticsfirst.com>



"GM-1" B-unit/Graphics trailer Available for rent or sale.
Call 412-400-5194 or e-mail pmtigm@aol.com for details.

Help Wanted

BROADCAST ENGINEER

WSOC/WAXN-TV, the Cox owned stations in Charlotte, NC are in search of an experienced Broadcast Engineer who can repair and maintain studio and transmission equipment with an emphasis on transmitter site facilities. You will assist with the design, documentation and execution of television system projects across various technology disciplines. This person will have primary responsibility for maximizing uptime by performing repairs and preventive maintenance on digital and analog transmission facilities. You will perform periodic measurements and recordkeeping to maintain FCC compliance. Secondary duties will include maintenance and repair of studio broadcast equipment and systems. This position requires 24/7 availability by pager.

This position requires extensive experience with high and low power RF transmitters and related systems. Must have demonstrable skills to troubleshoot and make repairs both accurately and timely. Must be thoroughly familiar with relevant FCC regulations. Factory television transmitter training is highly desired. Minimum of an Associate Degree in Electronics Technology. Minimum 10 years of broadcast television experience. SBE certification a plus. Must be a team player and able to work under pressure.

Please send resume to David Siegler, Director of Operations and Engineering, WSOC-TV, 1901 N. Tryon St., Charlotte, NC 28206. No phone calls please. EOE M/F

Help Wanted

ASSISTANT CHIEF ENGINEER- PRODUCTION AND MAINTENANCE

Maryland Public Television is seeking an Assistant Chief Engineer to provide support in our Technology Department. The Assistant Chief Engineer will be responsible for maintaining both production and Master Control systems. Will write specifications and obtain price quotes for procurement of equipment and develop and oversee vendor relationships. Will develop a preventative maintenance schedule, organize and control inventory. Will develop and oversee staff schedules and train staff on operation and maintenance of new and existing technical equipment.

We require a minimum of 5 years of broadcast experience which must include maintenance, design and troubleshooting skills at system and component levels and at least 3 years of experience supervising maintenance personnel. Knowledge of computer/ software skills, PC maintenance, Windows based network systems, and Unix/Linux operating systems essential. A Bachelor's of Science in Electrical Engineering is preferred but equivalent experience and training in broadcast engineering may be substituted. Candidates must possess a valid driver's license, be willing to be on emergency call, and be available to work a variety of schedules that may include nights, weekends and holidays.

We offer a salary between \$51,900.00 to \$65,000.00 and an excellent Maryland state benefit package that includes Health, Dental and Prescription options and a generous Leave plan.

Email, mail or fax cover letter and resume with title ASSISTANT CHIEF ENGINEER clearly indicated to Maryland Public Television, Recruitment Coordinator, 11767 Owings Mills Blvd, Owings Mills, MD 21117 FAX: 410-581-4382 resumes@mpt.org EOE

TV · AV SYSTEMS · INFO. TECHNOLOGY



Coast-to-Coast Staffing & Job Service

www.KeystoneAmerica.com

TECHNICAL ENGINEERING SALES/Mgmt VPGM



CALL TODAY: AL KORNISH - (570) 655-7143

Come to beautiful Wyoming...

Large spaces...small places

Central Wyoming College seeks

- WPTV - GENERAL MANAGER**
- WPTV - PRODUCER**
- WPTV - PRODUCTION COORDINATOR**
- WPTV DIRECTOR/VIDEOGRAPHER**

*Open until filled with review of applications beginning immediately.
Competitive Salary plus a generous benefit package.*

Located in Riverton, WY, **Central Wyoming College** is in the valley of the Wind River Mountains. The area has an international reputation for offering some of the best climbing, hiking, fishing and snowmobiling in the world. The mountains are also well known for outstanding alpine scenery. Hundreds of lakes, rivers and reservoirs offer fishermen and water skiers limitless possibilities, while mountain bikers and hikers enjoy back roads and trails that lead to outstanding scenic vistas.

The complete position announcement can be found on our web site at
http://cwc.edu/administration/human_resources/position_announcements.php



CENTRAL WYOMING COLLEGE is an equal opportunity employer and does not discriminate on the basis of race, color, national origin, ancestry, sex, age, religion or disability in admission or access to, or treatment or employment in, its educational programs, services or activities.



DIRECTOR - BROADCAST ENGINEERING PROJECTS

Are you the best broadcast engineer you know? Can you get things done on time, on budget, and with flair and creativity? Do you want to lead a terrific engineering team in building even better than the best broadcast production facilities?

If the answer is **"Yes"** to all of these questions, we'd like to talk to you. Immediately.

ESPN has the most technologically advanced broadcast facilities in the world. Our new all-HD Digital Center has set the standard for state-of-the-art ENG production technology. We've just broken ground in Los Angeles for our new West Coast Digital Broadcast Center and our growth continues to drive the need for more, better, and more interesting technical facilities.

What you will be doing: This executive role leads a staff of 3 Managers with approximately 20 engineers who are responsible for design and specification of 30+ meaningful projects per year and dozens of tech facilities and infrastructure improvements. You'll be asked to direct the planning, design, specification, and project scheduling for all of these projects. In other words, you'll be the principal architect for ESPN's broadcast facilities design.

What you need to have: A minimum of 10 years broadcast industry experience with broad-based technical knowledge and experience. You should have a track record of successful hands-on systems design and integration oversight, along with the demonstrated leadership skills and abilities to lead a management staff and their teams in large scale systems design projects.

You may currently be a Chief Engineer, or a Manager of Broadcast Engineering for a major market TV station...you may be a veteran of the broadcast technology industry, a senior level Customer Applications Manager for a major digital equipment manufacturer or broadcast systems integrator. Oh, and it won't hurt if you're nuts about sports, either. That's why we're here in the first place.

Visit our website and apply for this position, or if this is not just right for you, view all our Engineering opportunities in Bristol, CT to see what additional opportunities we offer:
www.espn.com/joinourteam

Are you one of us?



VIDEO ENGINEER

NEWS 12 TRAFFIC AND WEATHER CHANNEL
WOODBURY, NY

Cablevision's highly successful regional network, consisting of five, 24-hour channels devoted exclusively to traffic and weather in the NY market, is currently seeking an engineer for their Woodbury, NY facility. Position involves system installation/integration, network configuration, and ongoing maintenance for a number of highly automated MCR facilities.

Applicants must possess the following:

- Exp w/ equipment integration and installation.
- Ability to read and follow schematics and system wiring diagrams.
- Exp w/ troubleshooting electronic circuits down to the component level.
- Exp w/ computers including DOS, MS Windows 2K, XP, NT, Irix, Linux, and Mac OS.
- Extensive knowledge of IT Networking. A+, Network +, or MSCE a plus.
- Familiarity w/ automation, DDR's, Routers, various tape formats, test and measurement equipment.
- Minimum of an A.A.S. in Electronic or Electrical Engineering Technology or equivalent.
- Minimum four years exp w/ television broadcasting audio/video equipment.
- Be able to work flexible hours in a high-pressure env w/ strict deadlines.
- Clear and effective use of written and spoken English,
- Some lifting of heavy equipment required.

Cablevision offers a competitive compensation and a comprehensive benefits package. For consideration, send resume which must include reference 0601BE17466MB in cover letter to jobs@news12.com. Please include reference number in subject line of email). EOE M/F/D/V & A Drug Free Work place.

MOBILE UNIT ENGINEERS / DRIVERS

TRIO VIDEO, the Midwest's leading mobile television production company, is seeking qualified applicants for:

Mobile Unit Engineers to operate and maintain its standard and high definition mobile unit fleet from its base of operations in Chicago. Responsibilities include coordinating, troubleshooting and maintaining on-site mobile unit operations and equipment. All experience levels considered with: engineering degree, technical training, multiple years of hands-on broadcast experience or any combination.

Drivers for long-haul and local tractor/trailer transport from its base of operations in Chicago. Current CDL Class A license required with minimum of 3 years tractor/trailer experience.

Qualified candidates should send their resume to: Trio Video, 2132 West Hubbard, Chicago, IL 60612; resumes@triovideo.com; fax 312-421-0361.

Editorial Director: Brad Dick, bdick@prism2b.com
Editor/World Edition: David Austerberry, editor@broadcastengineeringworld.com
Managing Editor: Susan Anderson, sanderson@prism2b.com
Assoc. Editor/Webmstr: Chevonn Payton, cpayton@prism2b.com
Assoc. Editor: Spring Suptic, ssuptic@prism2b.com
Assoc. Editor: Angela Snell, asnell@prism2b.com
Sr. Art Director: Michael J. Krust, mkrust@prism2b.com
Art Director: Robin Metheny, rmetheny@prism2b.com
Technical Consultants: Computers & Networking – Brad Gilmer
 Antennas/Radiation – John H. Battison
 Digital Video – Michael Robin
 Transmission Facilities – Donald L. Markley
 Legal – Harry C. Martin
 New Technology – John Luff
 Industry Watcher – Paul McGoldrick
 New Media – Craig Birkmaier

Sr. VP: Peter L. May, pmay@prism2b.com
Group Publisher: Jonathan Chalon, jchalon@prism2b.com
Marketing Dir.: Kirby Asplund, kasplund@prism2b.com
Online Sales & Marketing Dir.: Samantha Kahn, skahn@prism2b.com
Vice President of Production: Lisa Parks, lparks@prism2b.com
Production Manager: Kathy Daniels, kadanies@prism2b.com
Classified Ad Coord.: Sarah Goulding, sgoulding@prism2b.com
Dir. Audience Marketing: Barbara Kummer, bkummer@prism2b.com
Group Show Director/LDI: Sharon Morabito, smorabito@prism2b.com

PRISM BUSINESS MEDIA™

Prism Business Media Inc.
President/CEO: John French, jfrench@prism2b.com
COO/CFD: Andrea Persily, apersily@prism2b.com



MEMBER ORGANIZATIONS

Sustaining Member of:
 • Society of Broadcast Engineers
 • Missouri Association of Publications
 Member, American Business Media; Member, BPA International,
 The Missouri Association of Publications

SUBSCRIPTION RATES: Free and controlled circulation to qualified subscribers. Non-qualified persons may subscribe at the following rates (Prices subject to change): USA and Canada, 1 year, \$70.00, 2 years, \$135.00, 3 years, \$200.00; Outside USA and Canada, 1 year, \$85.00, 2 years, \$165.00, 3 years, 245.00 surface mail (1 year, 155.00, 2 years, \$295.00, 3 years, \$440.00 airmail delivery). For subscriber services or to order single copies, write to Broadcast Engineering, 2104 Harvell Circle, Bellevue, NE 68005 USA; call 866-505-7173 (USA) or 402-505-7173 (outside USA); or visit www.broadcastengineering.com.

ARCHIVES AND MICROFORM: This magazine is available for research and retrieval of selected archived articles from leading electronic databases and online search services, including Factiva, LexisNexis and Proquest. For microform availability, contact National Archive Publishing Company at 800-521-0600 or 734-761-4700, or search the Serials in Microform listings at napubco.com.

REPRINTS: Contact FosteReprints to purchase quality custom reprints or e-reprints of articles appearing in this publication at 866-436-8366 (219-879-8366 outside the U.S. and Canada). Instant reprints and permissions may be purchased directly from our Web site; look for the PSCopyright tag appended to the end of each article.

PHOTOCOPIES: Authorization to photocopy articles for internal corporate, personal, or instructional use may be obtained from the Copyright Clearance Center (CCC) at 978-750-8400. Obtain further information at copyright.com.

PRIVACY POLICY: Your privacy is a priority to us. For a detailed policy statement about privacy and information dissemination practices related to Prism Business Media products, please visit our Web site at www.prism2b.com.

CORPORATE OFFICE: Prism Business Media, 9800 Metcalf, Overland Park, Kansas 66212 • 913-341-1300 • prism2b.com

Copyright 2006, Prism Business Media Inc. All rights reserved.

	Page #	Advertiser Hotline	Website Address
ADC Telecommunications Inc.	83	1-800-366-3891	adc.com/broadcast
AJA Video	85	530-274-2048	aja.com
Avid Technology	4-5	800-949-AVID	avid.com/interplay
Axcera	109	724-873-8100	axcera.com
Azden Corp.	75	516-328-7500	azdencorp.com
Barco Visual Solutions	143	+1-678-475-8000	barcocontrolrooms.com
Baron Weather Services	133	256-881-8811	baronservices.com
Belden	111	1-800-BELDEN-4	belden.com
*Bit Central Inc.	99-102	800-214-2828	bitcentral.com
Blackmagic Design	19		blackmagic-design.com
Broadcast Microwave Services	121	800-669-9667	bms-inc.com
Calrec Audio Ltd.	63	+44(0) 1422 842159	calrec.com
Canare Cable Inc.	93	818-365-2446	canare.com
Canon USA	22-23		canondv.com
Canon USA Broadcast Lens	43	1-800-321-HDTV	canonbroadcast.com
Clear-Com Communication Systems	87	1-510-496-6600	clearcom.com
Crispin Corporation	74	919-845-7744	crispincorp.com
Dell Computer	35	877-778-4829	dell.com/dccsolutions
DMT USA	47	888-912-8326	dmtonline.us
Dolby Labs Inc.	17		dolby.com/tvaudio
DYMO Corporation	65		rhinolabeling.com
Echolab	105		studioensemble.com
Ensemble Designs	103	1-530-478-1830	ensembledesigns.com
ERI Electronics Research Inc.	141	877-ERI-LINE	eriinc.com
ESE	117	310-322-2136	ese-web.com
Euphonix	31	650-855-0400	euphonix.com
Evertz Microsystems Ltd.	IBC	905-335-3700	evertz.com
Fischer Connectors	119	800-551-0121	fischerconnectors.com
For-A Corporation of America	77	+1-714-894-3311	for-a.com
Front Porch Digital	51	936-520-6042	fpdigital.com
Fujinon Inc.	73	973-633-5600	fujinon.com
Harris Broadcast	3	800-4-HARRIS	harris.com/h-class
Ikegami Electronics Inc.	7	201-368-9171	ikegami.com
Inlet Technologies	21	919-256-8145	inlethd.com
Iconix	39	800-783-1080	iconixvideo.com
Kino Flo Inc.	114	818-767-6528	kinoflo.com
Leitch Inc.	37	1-800-231-9673	broadcast.harris.com/icon
Leitch Inc.	BC	1-800-231-9673	broadcast.harris.com/nexioxs
Marshall Electronics Inc.	115	800-800-6608	lcracks.com

	Page #	Advertiser Hotline	Website Address
Maxell Corp. of America	9	800-533-2836	maxellpromedia.com
Middle Atlantic Products Inc.	41	800-266-7225	middleatlantic.com
Miller Camera Support	137	973-857-8300	millersprinter.com
Miranda Technologies Inc.	11	514-333-1772	miranda.com
MITEQ	81	630-759-9500	mcl.com
Modulation Sciences	97	800-826-2603	modsci.com
NEC Display Solutions America	61	866-NEC-MORE	necdisplay.com
Network Electronics	131	800-420-5909	network-electronics.com
NVision Inc.	50	1-800-719-1900	nvision.tv
Omneon Video Networks	27	1-866-861-5690	omneon.com
Opticomm Corp.	71	800-867-8426	opticomm.com
Panasonic Broadcast	14-15	1-800-528-8601	panasonic.com/broadcast
Pixel Power	135		pixelpower.com
Popwire Technology	53		popwire.com
Pro-Bel	139		pro-bel.com
Quantum Corporation	89		quantum.com/tape4 tapelessworld
Radyne Corporation	49	602-437-9620	radn.com
Riedel Communications	94	+1-818-563-4100	riedel.net
Rohde & Schwarz	91	1-888-837-8772	rohde-schwarz.com/usa
Ross Video Ltd.	44-45	613-652-4886	rossvideo.com
Scientific Atlanta Inc.	18		scientificatlanta.com/compete
Sencore	107	1-800-SENCORE	sencore.com
Sennheiser Electronic GmbH	13		sennheiser.com
Snell & Wilcox Ltd.	32-33		snellwilcox.com
Sony Pictures Digital Media	127		sony.com/cinescore
Streambox	122	206-956-0544	streambox.com
Sundance Digital	123	972-444-8442	sundancedigital.com
Switchcraft Inc.	129	773-792-2700	switchcraft.com
Telecast Fiber Systems Inc.	95	508-754-4858	telecast-fiber.com
Telemetry Inc.	69		telemetryinc.com
Telex	48	1-800-392-3497	rts.intercoms.com
Thales Angenieux	29	973-812-3858	angenieux.com
Utah Scientific	79	801-575-8801	utahscientific.com
Videotek Inc.	67	800-800-5719	broadcast.harris.com/videotek
Wheatstone Corporation	IFC	252-638-7000	wheatstone.com
Wohler Technologies Inc.	113	1-888-5-Wohler	wohler.com
360 Systems	25	818-735-8223	360systems.com

*Denotes ad placement in only selected editions of this month's magazine.

US/CANADA WEST

George Watts III
(360) 546-0379; Fax: (360) 546-0388
georgeww3@aol.com

EAST

Josh Gordon
(718) 802-0488; Fax: (718) 522-4751
jgordon5@bellatlantic.net

MIDWEST

Emily Kalmus
(312) 840-8492; Fax: (913) 514-6131
ekalmus@prismb2b.com

INTERNATIONAL EUROPE

Richard Woolley
+44-1295-278-407
Fax: +44-1295-278-408
richardwoolley@btclick.com

Israel

Asa Talbar
Talbar Media
+972-3-5629565; Fax: +972-3-5629567
talbar@inter.net.il

JAPAN

Mashy Yoshikawa
Orient Echo, Inc.
+81-3-3235-5961; Fax: +81-3-3235-5852
mashy@fa2.so-net.ne.jp

CLASSIFIED ADVERTISING

Susan Schaefer
(484) 478-0154
Fax: (484) 478-0179
sschaefer@prismb2b.com

REPRINTS

FosteReprints
(866) 436-8366;
International inquiries: (219) 879-8366

LIST RENTAL SERVICES

Marie Briganti, Walter Karl
(845) 620-0700
(845) 620-1885
marie.briganti@walterkarl.infousa.com

Customer Service: 913-967-1707 or 800-441-0294

June 2006, Vol. 48, No. 6 (ISSN 0007-1994) is published monthly and mailed free to qualified persons by Prism Business Media, 9800 Metcalf Ave., Overland Park, KS 66212-2216. Periodicals postage paid at Shawnee Mission, KS, and additional mailing offices. Canadian Post Publications Mail Agreement No. 40597023. Canada return address: DHL Global Mail, 7496 Bath Road, Unit 2, Mississauga, ON L4T 1L2. POSTMASTER: Send address changes to Broadcast Engineering, P.O. Box 2100, Skokie, IL 60076-7800 USA. CORRESPONDENCE: Editorial and Advertising: 9800 Metcalf, Overland Park, KS 66212-2216 Phone: 913-341-1300; Edit. fax: 913-967-1905. Advert. fax: 913-967-1904. © 2006 by Prism Business Media. All rights reserved.

NAB times are a-changin'

BY PAUL MCGOLDRICK



NAB2006 is over. Most of us are back home nursing sore feet and trying to get back to a normal sleep pattern. The show was memorable for the reasonable temperatures and nice breeze in Las Vegas and for the least crowded show floors seen in a while. There were more than 105,000 official NAB badges issued, but that is not reality.

A change in the industry

The NAB show is different these days. The 1500-plus exhibitors were concentrated in the Upper and Lower South Halls, with the Central Hall looking spacious and only half of the North Hall in use; the days when it was difficult to find space in that focused audio and radio hall are over.

The industry has changed in a way that many of the larger box vendors do not understand and have not accepted. Solutions are moving from the dedicated, often elegant, black box to solutions focusing on what you can do with the software component. This is changing the kind of audience who attends the show. I would love to look at the breakdown of show visitors' occupations — something NAB is not going to let anyone outside the organization see. I would bet that more than 75 percent of the non-exhibitors are not directly connected to broadcasting.

A change in leadership

NAB itself has also changed. The reins were changed last December with the departure of Eddie Fritts. His replacement, David Rehr, is a long-time player within the Washington, D.C., Beltway, whose last gig was as CEO of the National Beer Wholesalers Association (NBWA).

I am the last person to suggest that

someone who promoted beer distribution is any less qualified to represent mom-and-pop radio and TV stations. A good CEO can probably drop into any industry slot and do well, unburdened with the past history of that business. I do wonder, however, why the NBWA Political Action Committee (PAC), which disbursed money

I do agree, at least partially, with a comment that Rehr made in an interview: "The idea that you can walk into a Best Buy or Circuit City today and be sold a TV that will be obsolete in three years, without any warning to the consumer, is a travesty." Why limit it to Best Buy and Circuit City?

The new CEO also wants to ensure

Solutions are moving from the dedicated, often elegant, black box to solutions focusing on what you can do with the software component.

every election cycle (isn't "disbursed" a lovely version of "paid off with contributions?"), needed so many political favors. But Rehr's main qualification for the NAB position was that, with the NBWA PAC, he increased payouts from \$400,000 to nearly \$3 million every election.

The choice of a professional lobbyist for the NAB position is a clear indicator of where and how the organization believes it can achieve its members' targets.

What are those targets? The word broadcasting does not mean terrestrial transmission to NAB any more. NAB wants to:

- have the power to rein in satellite operators;
- make cable systems carry every kind of programming it wants to send them; and
- increase the number and type of distribution channels and platforms that can be used.

The organization also wants to send politicians the message of how important local content is — something that has already all but completely disappeared from radio and is declining rapidly in television.

that the transition to digital broadcasting is smooth — meaning both digital TV and HD radio — and I'm sure he really understands all the issues associated with the latter. This ranks right up there with Intel High Definition Audio ...

Conclusion

NAB should seriously consider talking to its members about how much longer terrestrial broadcasting should continue in countries where the RF spectrum can be so much more efficiently used. I love RF, but how can we continue to justify the amounts of electrical power that are required, often 24/7, to deliver signals that are not being used by the majority of cable viewers? **BE**

Paul McGoldrick is an industry consultant based on the West Coast.

ATTENTION READERS!
Sign up now for
BroadcastEngineering's
News Technology Update
e-newsletter
at www.broadcastengineering.com



Send questions and comments to:
paul_mcgoldrick@pnsm2b.com

THE LEADER IN HDTV & IPTV



Routing Systems

Distribution & Conversion

Fiber Optics

Time Code

Closed Captioning

Production/Post Production

Multiviewers

Fully Integrated Master Control

QMC

MVP

The Leaders in HDTV, and now the Leaders in Routing & Master Control

New York Sales
newyorksales@evertz.com

Washington Sales
dcsales@evertz.com

evertz
905.335.3700
www.evertz.com

US / International Sales
sales@evertz.com

US West Coast Sales
LAsales@evertz.com

UK Sales
uksales@evertz.com

The right server for the job.

Not as cost-effective as NEXIO

Lacks NEXIO's agile internal encoding.

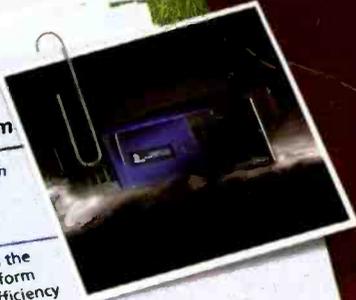
NEXIO XS™

Expert in true shared-storage networking

Leader in software coding and decoding

Curriculum

Champion in scalability



Objective

I provide broadcasters worldwide with the smallest and fastest HD/SD server platform that simplifies workflow, optimizes efficiency and maximizes ROI.

Summary of Qualifications

Developed from a long lineage of shared-storage systems. SD with HD included for free in a baseband server – with a choice of internal and external storage – which is less expensive, easier to use and service, and capable of a much larger range of encode options than any other potential candidate. All this in a single 3RU frame!

Area of Specialization

All hybrid HD/SD systems. Transmission applications, commercial insertion, newsrooms, mobile production facilities, sports.

Critical Skills

- 6 channels in 3RU
- HD (1080i/720p) and SD (525/625)
- Software coding and decoding of media with back-to-back DV/MPEG playback
- Patented, Emmy Award-winning RAIDsoft™ software storage protection
- Front access to boot and media drives, USB and IEEE-1394 (FireWire™) ports
- 4Gbps Fibre Channel support
- Industry's best file transfer performance (up to 80 MB/s per chassis)
- Full dual redundant path to storage

Professional Affiliations

- Integration of Velocity™ editing platform on the same SAN
- Fully compatible with all major automation, asset management and archive partners

Languages

- TCP/IP, UDP, FTP protocols
- MXF, AVI, DV, MPEG, IMX file formats

Accomplishments

- More than 1000 installations in 80 countries worldwide
- Industry award-winning technology leader



Today's changing media environments demand a new kind of server. NEXIO XS™ is more than up to the challenge. Exceptional capabilities and a comprehensive selection of applications – all fully integrated in a compact, 3RU frame.

Check out the qualifications of NEXIO XS at www.broadcast.harris.com/nexioxs

USA East +1 800 231 9673 | USA West +1 888 843 7024 | Canada +1 800 387 0233 | Latin America +1 305 512 0045

Leitch is a brand of Harris Corporation.



assuredcommunications™
Broadcast • Microwave • RF • Government Systems

www.harris.com