MARCH 2011

Broadcast Engineering®

www.broadcastengineering.com

NAB PREVIEW

- **DTV Marketplace**
  New products preview
- **Exhibit Hall Map**
  Plan your travel across four halls
- **2011 Excellence Awards**
  See 1st and 2nd place facilities

ALSO INSIDE:

CLOUD COMPUTING
Today's broadcast facility is now the cloud

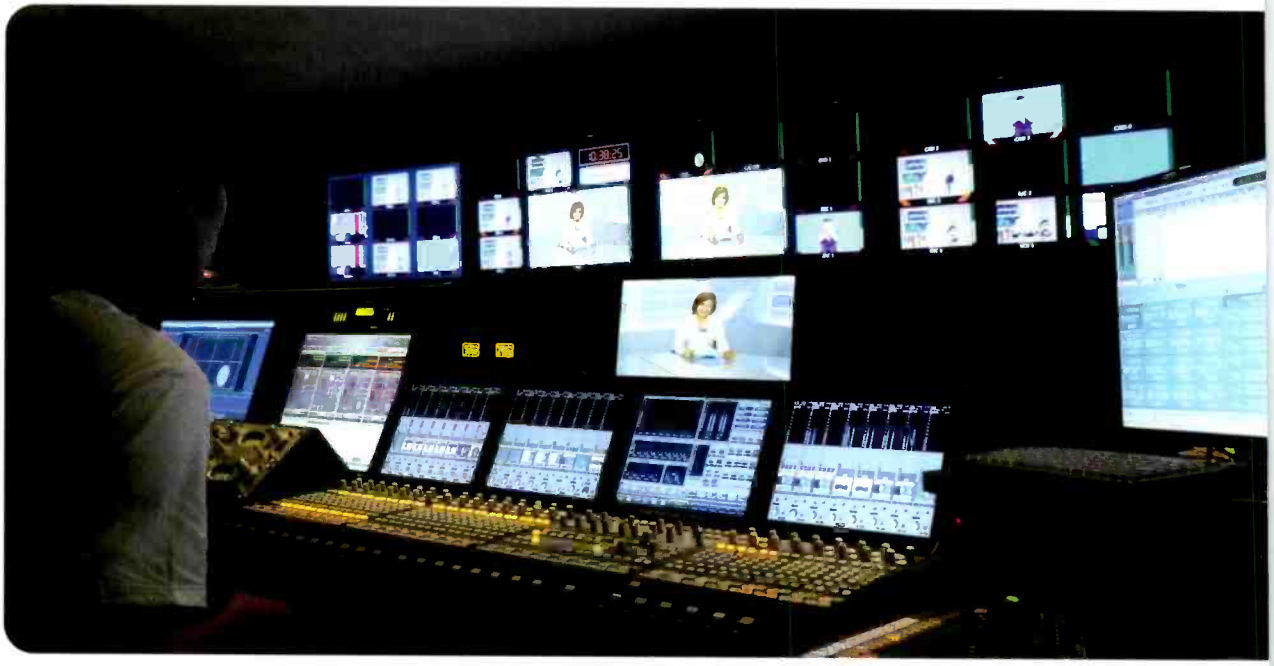
HD INTERFACES
Better ways to connect displays

A PENTON MEDIA PUBLICATION

www.solidstatelogic.com

C10HD

Big console power in a compact, simple and affordable package.



- Integrated 'Production Assistants' like Dialogue Automix and 5.1 Upmix
- Renowned SSL reliability and support
- Premium audio quality, ready for 5.1 production
- Simple to install with flexible I/O options
- Easy to operate for users of all skills levels

Take the video tour at:

www.solidstatelogic.com/C10

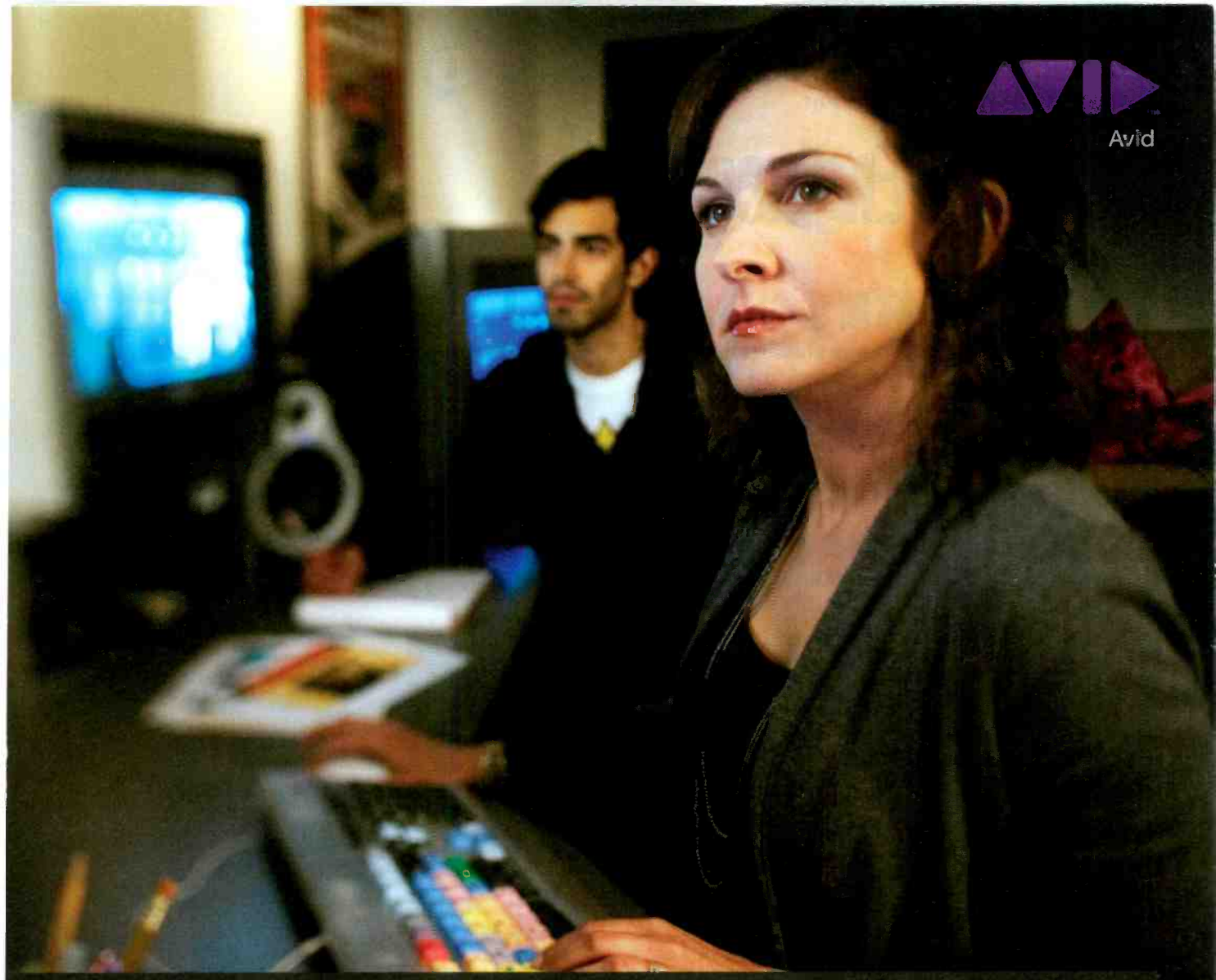
Get in touch

East Coast -
Steve Zaretsky | T: 1 (212) 315-1111 ext. 15 | stevez@solidstatelogic.com
West Coast -
George Horton | T: 1 (213) 249-9229 ext. 15 | georgeh@solidstatelogic.com

Broadcast Audio. This is SSL.

Solid State Logic
SOUND | | VISION

Oxford +44 (0)1865 842300 New York 1 (212) 315-1111 Los Angeles 1 (213) 249-9229 Paris +33 (0)1 48 67 84 85 Milan +39 039 2328 094 Tokyo +81 (0)3 5474 1144



Avid

Make the Most of Your Media with Avid Interplay

Your media is your lifeblood. From it flows the two most essential elements of your business: creativity and profit.

Avid® Interplay® is the media management foundation of today's competitive media organization, providing you with the most innovative MAM and PAM technology available. Whether you produce or manage news, sports, reality, drama, documentaries, or any other type of content, Interplay enables you to:

- Create more content, and distribute it to more outlets than ever before
- Instantly find, access, and use media anywhere, anytime
- Dramatically boost efficiency and profitability

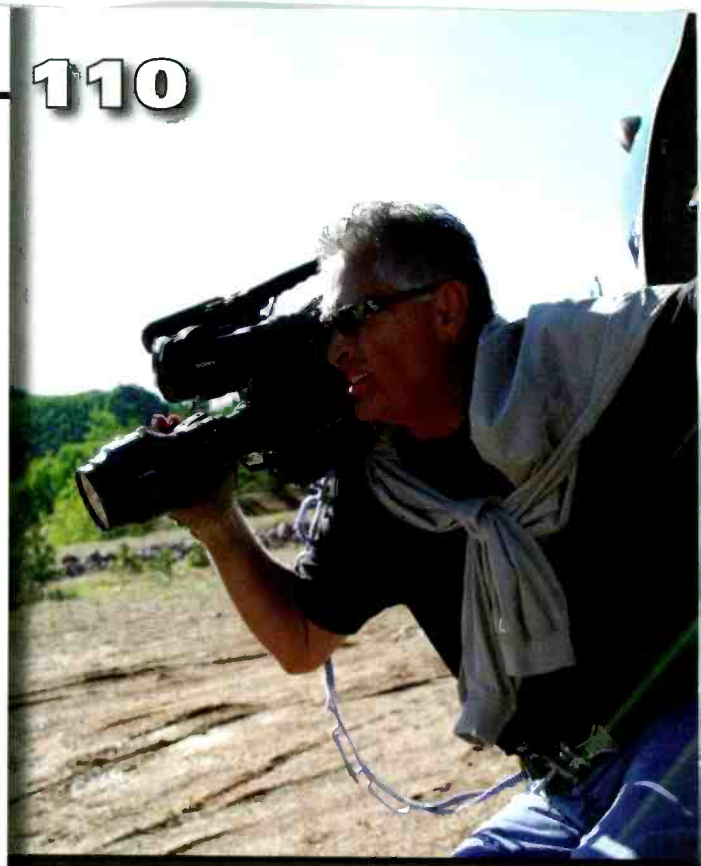
Find out how. Visit **www.avid.com/mmm/interplay**

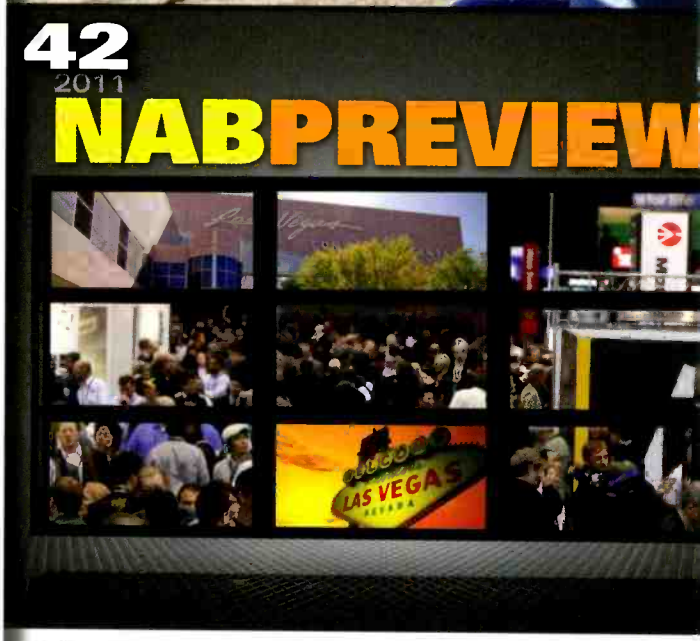
TABLE OF CONTENTS

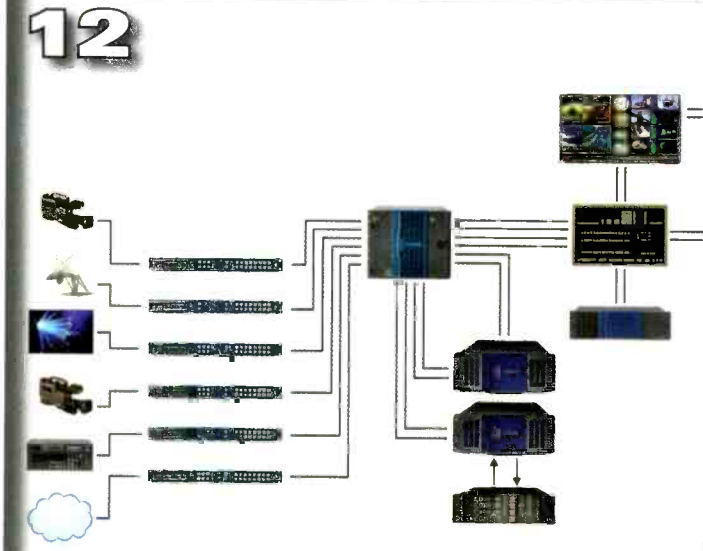
VOLUME 53 | NUMBER 3 | MARCH 2011

Broadcast Engineering®

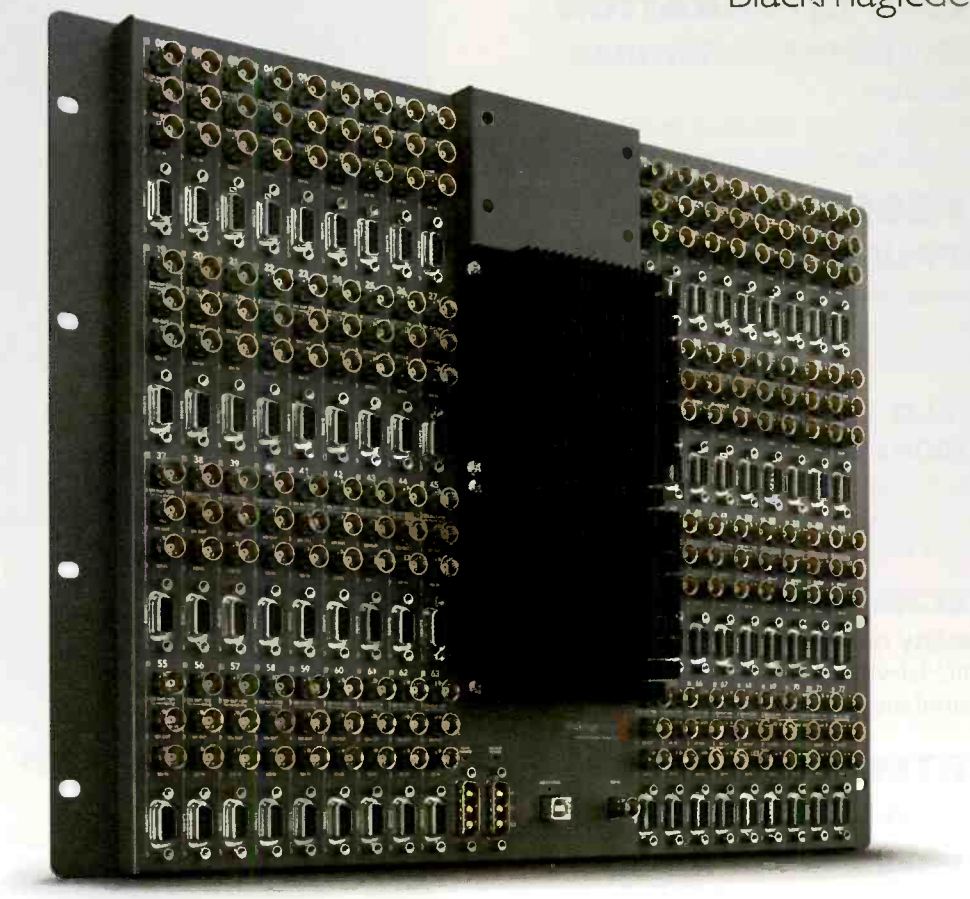
FEATURES







Blackmagicdesign



Introducing the world's largest affordable SD, HD and 3 Gb/s SDI router!

Eliminate complicated manual video patching forever! Broadcast Videohub is a powerful broadcast grade routing switcher featuring a massive 72 inputs, 144 outputs, 72 deck control ports, auto switching SD, HD, and 3 Gb/s SDI, in a compact rack mount chassis only a few inches thick.

Industrial Strength Routing Switcher

With 72 inputs and 144 outputs, Broadcast Videohub has enough SDI connections for 72 edit systems or decks. With twice as many SDI outputs, each user can have a completely independent SDI output for monitoring. This means you can monitor direct from any equipment in your building without effecting routing! 72 deck control ports are also included for a complete routing solution.

Simultaneous SD, HD or 3 Gb/s Video

Broadcast Videohub handles mixed SD, HD and 3 Gb/s SDI connections all on the same router at the same time. Broadcast Videohub detects when an input changes, and automatically sets all the outputs connected, to match the changed input. SDI re-clocking and output SDI slew rates will also change automatically.

World's Highest Quality

With exciting new 3 Gb/s SDI connections built in, Broadcast Videohub allows twice the SDI data rate than normal HD-SDI. Use 3 Gb/s SDI for high resolution real time 2048 x 1556 feature film editing. 3 Gb/s SDI has full compatibility with SD, HD and 2K in 4:4:4 or 4:2:2 all with a single BNC cable.

Network Router Control

Broadcast Videohub uses software control panels that run on Windows™ and Mac OS X™ for "routing control" right from your editing system desktop! Broadcast Videohub connects to any computer via USB and is then shared over your local network. Router labels can be changed from any computer and are fully unicode compatible for foreign language support.

Broadcast Videohub

$14,995

Learn more today at **www.blackmagic-design.com**

TABLE OF CONTENTS (CONTINUED)

VOLUME 53 | NUMBER 3 | MARCH 2011

SYSTEMS INTEGRATION

NEW MEDIA NETWORKS

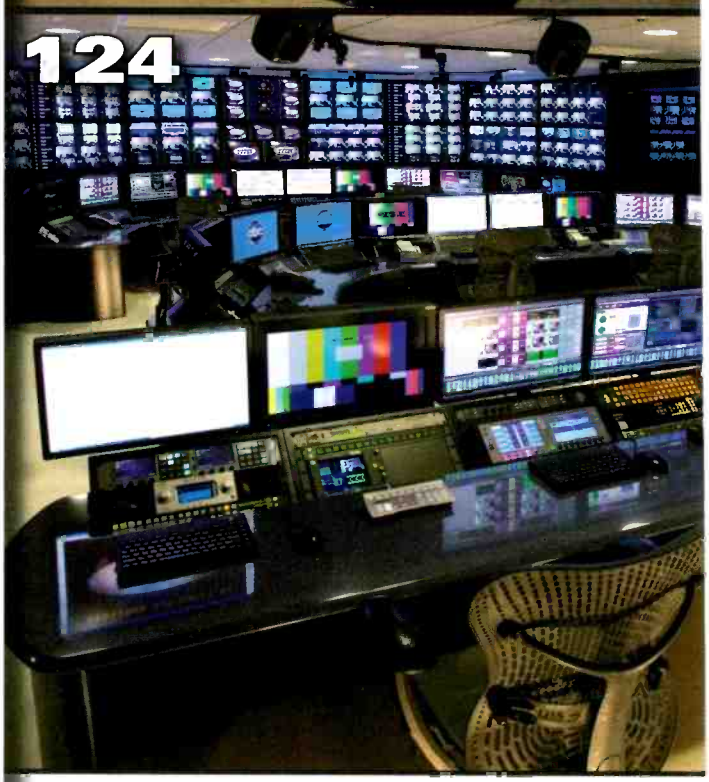
NEW PRODUCTS & REVIEWS

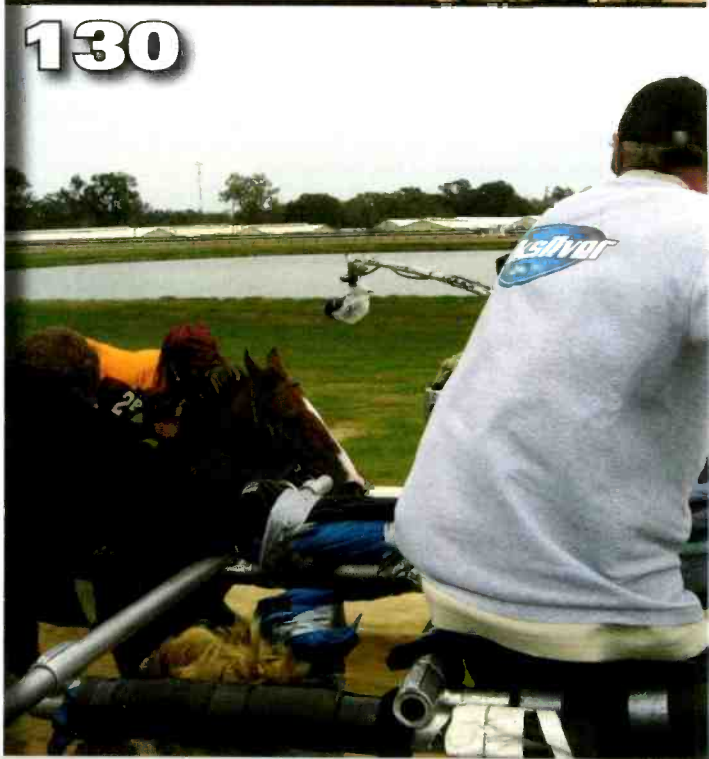
APPLIED TECHNOLOGY

FIELD REPORT

TECHNOLOGY IN TRANSITION

DEPARTMENTS





JUST THE FACTS!

Technology innovator Thomas Keller will be honored at the NAB Technology Luncheon with the 2011 NAB Television Engineering Achievement Award.

Learn more at *www.broadcastengineeringworld.com*

SEE IT ONLINE!

Register for upcoming training series webcasts, and download past events on-demand.

Learn more at *www.broadcastengineeringworld.com*

Visit us at NAB, stand C9508

Ingest. Manage. Create.

IP.Director for fast & efficient production

IPDirector is a field-proven software suite from EVS that guarantees workflow efficiency and instant control of media. With its modular architecture for ingest, production and media management, as well as its transparent integration with 3rd party craft editors, it is the most efficient tool for fast-turnaround productions on the market.

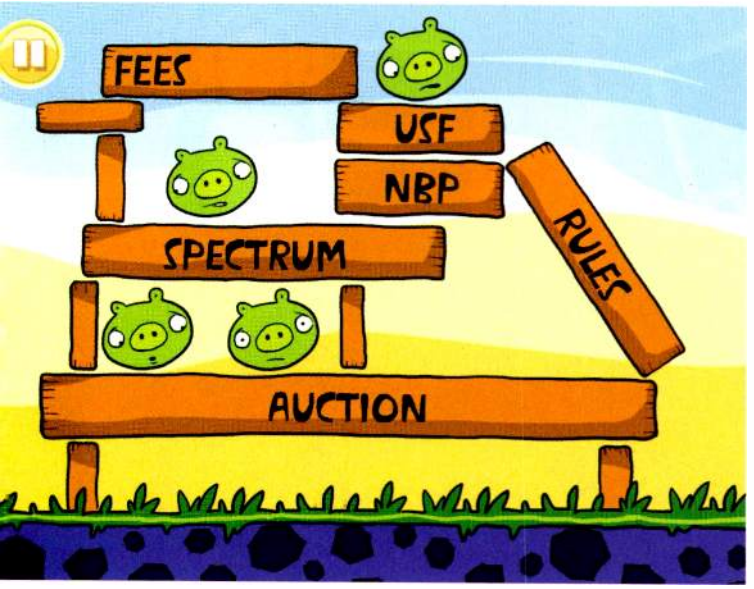
EVS Designed to Perform

www.evs.tv

Content Production Management

Angry birds and Lady Gaga

Obama's FCC continues its hell-bent drive to remake the entire telecommunications infrastructure. This, despite multiple court rulings and congressional warnings to cease and desist. Add to this the chairman's wanton profundity to mislead America with his selective use of facts and data. Combined, we have a mash-up of the Angry Birds game and Lady Gaga.



On Feb. 7, FCC Chairman Julius Genachowski spoke to the Information Technology and Innovation Foundation (ITIF), where he again ranted about America's low ranking in broadband adoption. According to Genachowski, the United States is last among major nations in broadband adoption. His speech was just another attempt to bolster his case to force broadcasters off the air.

Let's examine our chairman's house of (dis)honesty.

Genachowski often selectively picks data from this year's FCC 706 Report to Congress and his National Broadband Plan in his speeches. Let's examine some of the so-called "facts" the chairman often quotes.

First, as any bureaucrat knows, if the facts don't support your case, just change definitions. In a blatant effort to portray the low rate of broadband adoption, the FCC changed key measurement definitions between the 2009 and 2010 reports. For instance, the definition of "broadband" in the 2009 report was a wired or wireless link with a speeed above 200kB/s.

In order to strengthen the agency's broadband case, beginning with the 2010 report, the FCC redefined broadband to be a wired 4Mb/s or higher service. And, wireless links were no longer counted. Any of you with 3G or 4G connectivity, by FCC definition, do not have broadband.

Under the previous 706 Report definitions, a 3Mb/s wireless link was classified broadband. Under those definitions, the United States was not last, rather 12th, worldwide in broadband adoption. Yet, the FCC simply changed key definitions, and America suddenly drops to 40th (last) on the same list in one year. Dishonesty.

Genachowski also obfuscates the truth in other ways by saying that the United Sates is "last" when compared to other countries. However, the score he mentions represents a composite measurement across multiple survey points and over time, most of which have nothing to do with broadband adoptions!

In fact, the ITIF concluded from the same data that the United States leads Europe in 13 of the 16 indicators, including knowledge (higher education and number of researchers); innovation (corporate and government R&D and scientific publications); information technology (IT investments, e-government and broadband); overall business climate; entrepreneurship (new firms and venture capital); and productivity.

Second, the chairman cleverly ignores data from his own study when it doesn't support the points he's trying to score. America's broadband adoption rate isn't "low" because of a lack of availability; it's because some Americans either don't want broadband or don't have a computer that requires it.

Further chairman fuzzy math ... When Genachowski says that "24 million Americans" don't have broadband, that means individuals. However, broadband (like TV) usage should be measured across "households," not "per-capita." We don't measure TV set penetration by persons, but by household. Broadband should likewise be measured.

Finally, the ITIF report notes that the FCC's own documentation shows that U.S. broadband implementation is growing 30 percent faster than ever before. But our chairman ignores that truth.

Genachowski's latest the-sky-is-falling speech is little more than a mash-up of the Angry Birds game and Lady Gaga. His speeches may sound good, but they are full of holes and short on truth. BE

Brad Dick

EDITORIAL DIRECTOR

Send comments to: editor@broadcastengineering.com

Rethink IT-based automated playout

Miranda's iTX is the world's most advanced IT-based automated transmission platform. It streamlines multi-format workflows, and rewrites the traditional cost of ownership model for multi-channel operations. With enterprise grade IT servers and software, iTX also delivers unmatched resilience, scalability, and speed of deployment. Additionally, with over 1000 iTX channels deployed worldwide at major broadcasters and playout centers, it's fully proven for primetime.

Miranda

Rethink what's possible

www.miranda.com/itx

Images Courtesy of NBA D-League *Optional TriCaster TCXD850 CS Hardware Control Surface*

Learn more about TriCaster at:

www.newtek.com/be

Scan. Connect.
Share your *TriCaster-smart* story.

TAKE CONTROL

NewTek TriCaster™ TCXD850 is like having an HD live truck that fits in your rack or on your desk. In live production, there's no time to second guess. We get what you're up against, that's why we build TriCaster

- Affordable 24-channel, native HD system (up to 1080p) that broadcasts, streams, projects and records
- Eight external sources with the ability to mix and match formats
- Eight virtual/mix channels for layered switcher effects
- Two built-in DDRs to deliver video clips, motion graphics, and more
- Multi-view monitoring with simultaneous views of all inputs
- 18 HD, live virtual sets provide a network-style setting in a small space

Add the TriCaster TCXD850 CS hardware control surface and have illuminated buttons, a premium T-bar and three-axis joystick mapped directly to the TriCaster TCXD850 workspace. Now, you can make split-second decisions with your eyes on the show and your hands at the controls.

It's time. Take control.

NewTek
www.newtek.com

NAB booth #SL4514
April 11-14, 2011

Cloud broadcasting

Do we accept it or drive it?

BY STAN MOOTE

We have all heard about cloud computing — a method of sharing computer resources and software over the Internet on demand. But what does this have to do with broadcasting? To better understand the connection, we need to consider two factors: how our signal flows and how talented engineers have changed over the past decades.

Traditionally, when we as broadcasters needed to get a video between plants or remotes, we simply ordered up a TV1 line from the local telco, and presto! NTSC with audio got delivered matching the RS-250B long-haul spec. Then the digital revolution began, and suddenly there was no such thing as a system drawing that didn't feature a network cloud. (See Figure 1.)

At that time, only a select group of people knew what was really inside

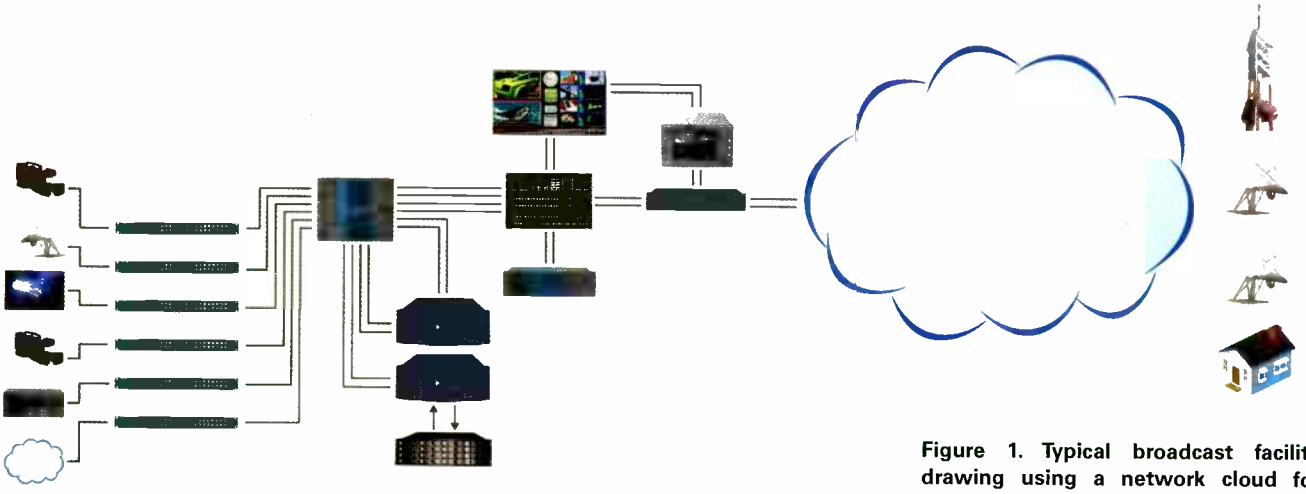


Figure 1. Typical broadcast facility drawing using a network cloud for distribution

that networking cloud. As broadcasters, we gave the network cloud provider our signals on coax or twisted pair, and at the other end — as if by magic — we got a coax or twisted pair back again with our signals. We had no idea how it worked and didn't care much as long as we didn't see sparkles on the screen or hear audio hits. Perhaps we gave them digital video or perhaps analog; it really didn't matter. The cloud provider figured out how to give us the same signal back.

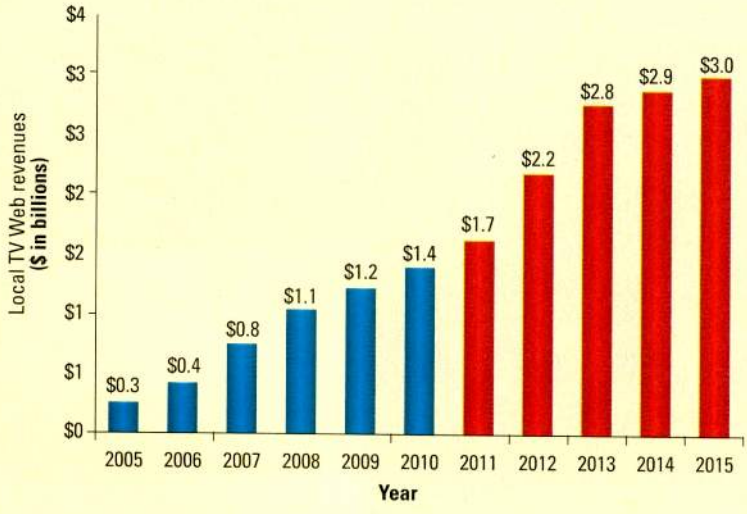
In an attempt to measure or capture sparkles and audio hits information, we created Error Detection and Handling (EDH) SMPTE RP 165-1994. Cloud providers went to great lengths in attempting to match our EDH world with their bit error rate (BER) measurements used in the world of data transmission. As our EDH measurements are frame-based

FRAME GRAB

A look at the issues driving today's technology

Web revenue for TV stations soars

Online revenue is set to climb 17 percent this year.



Source: TVB

www.tvb.org

www.aja.com

Route it. Convert it.
Connect with AJA.

KUMO

3G SDI Routing, set-up in seconds...

KUMO 1604 - 16 SDI inputs - 4 outputs
KUMO 1616 - 16 SDI inputs - 16 outputs
KUMO CP - 1RU Control Panel

Compact and cost-effective, KUMO SDI routers are ready for any broadcast, production or post-production environment. Easy to install, KUMO runs Embedded Linux for fast configuration and operation via any standard web browser or the optional KUMO CP 1RU control panel. KUMO routers and the KUMO CP panel also support Bonjour - enabling zero-configuration networking with Mac's and Bonjour-enabled PC's.

FiDO

SDI - at the speed of light...

The latest addition to our class-leading range of Mini Converters, FiDO is a family of SDI/Optical Fiber converters that allow the transport of SDI, HD-SDI and 3G SDI over distances of up to 10km. There are 5 models, including dual channel transmitters and receivers, offering the highest density and lowest cost available. FiDO brings AJA's renowned quality and reliability to Optical Fiber conversion.

Find out about our latest broadcast and conversion solutions
by visiting us at www.aja.com

Because it matters.

AJA®
VIDEO SYSTEMS

and their BER calculations are continuous, EDH and BER don't match up and can't be correlated. Somehow, we all progressed beyond these simple numbers and quickly learned that digital links were typically either horrible or acceptable, and acceptable ones were far superior to the tape drop-outs and satellite sparkles that we as an industry had deemed acceptable in the past.

This move to digital started to clearly define contribution and distribution links because we no longer had RS250B short-haul and long-haul specs. However, more important were the bandwidth charges for different data rates. It was one thing to pay for a TV1 line; getting a dark fiber or 270Mbs line was very expensive. To combat these significant bandwidth charges, we began using different video and audio compression rates for different types of applications, hence yielding contribution services for backhaul type applications and distribution for network feeds.

To confuse the situation more, these were never standardized, which resulted in different applications construing different meanings for contribution and distribution links. Also, the definition of signal latency quickly went from frames to seconds. Broadcast engineers needed to be very careful in specifying the proper link technology to match the intent of the signal being transported.

On the telco side, there were "turf wars" about Asynchronous Transfer Mode (ATM) vs. Multiprotocol Label Switching (MPLS). It was good that a few broadcasters got involved in these activities, which ultimately assured that both technologies could be used for television. Fortunately, in many cases we don't care which carrier technology is used as long as we get our television signal back with acceptable quality from the cloud.

All of this aside, as in Figure 1, all of our system drawings during that time featured these magical clouds.

Role reversal

Here we are 10 years later with more engineers knowing what is inside the network cloud and how it works than understand what television is about. To these engineers, television is just another data type — specialized compared to other data types, but still "just data." So, why did this happen?

Simple economics — consumer demand for bandwidth for phones (mobile and fixed), Internet, private networks for home and decentralized offices, and, of course, the multichannel explosion. Both educational institutions and companies scrambled to develop a huge workforce that possessed an understanding of what networking is all about. The numbers of networking engineers grew; the number of broadcast engineers shrunk. Don't get me wrong: There is a small group of engineers that either do understand both worlds or strive to learn networking and broadcasting.

As broadcasters, we think of this as a role reversal. Networking is no longer a cloud. Rather, the *broadcast facility* is now the cloud. (See Figure 2). New media outlets are popping up everywhere; existing outlets are constantly growing channel capacity. Do most of these distribution outlets care about how the content was frame synched, lip synched, format converted, switched and processed? No! They just want content streams or files. To them, television magically pops out of some content cloud somewhere in the world.

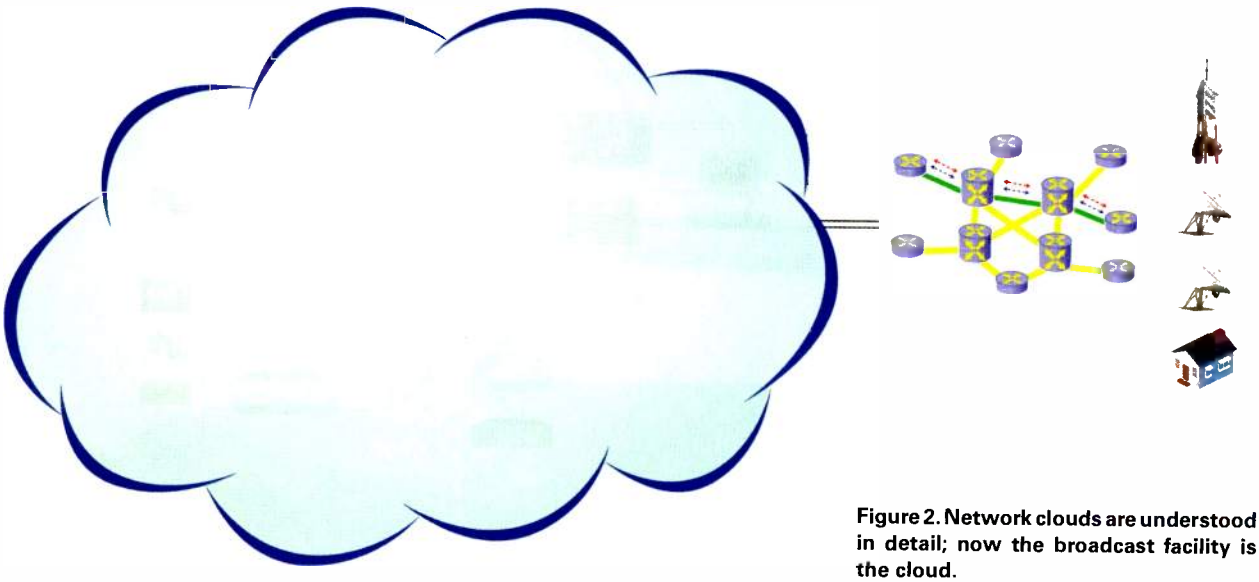


Figure 2. Network clouds are understood in detail; now the broadcast facility is the cloud.

This doesn't mean that the art of broadcast is dying or becoming extinct. It is more like Latin — spoken and understood only by a few scholars, but forming the root of so many modern languages. In the current evolving media environment, we have developed numerous modern forms that stem from original broadcast standards and practices created years

Mobile Television Ready

The all-in-one broadcast analyzer now supports ATSC-MH (A/153)

The R&S ETL TV analyzer is the all-in-one broadcast analyzer combining the functionality you need most.

- TV and FM (radio) signal analyzer
- Video and MPEG TS analyzer
- Spectrum Analyzer
- TS generator and recorder

All this functionality and still under 20 pounds.

rohde-schwarz.com

Visit us at NAB 2011
Booth #SU3721

MDTV
MOBILE DIGITAL TELEVISION

ROHDE&SCHWARZ

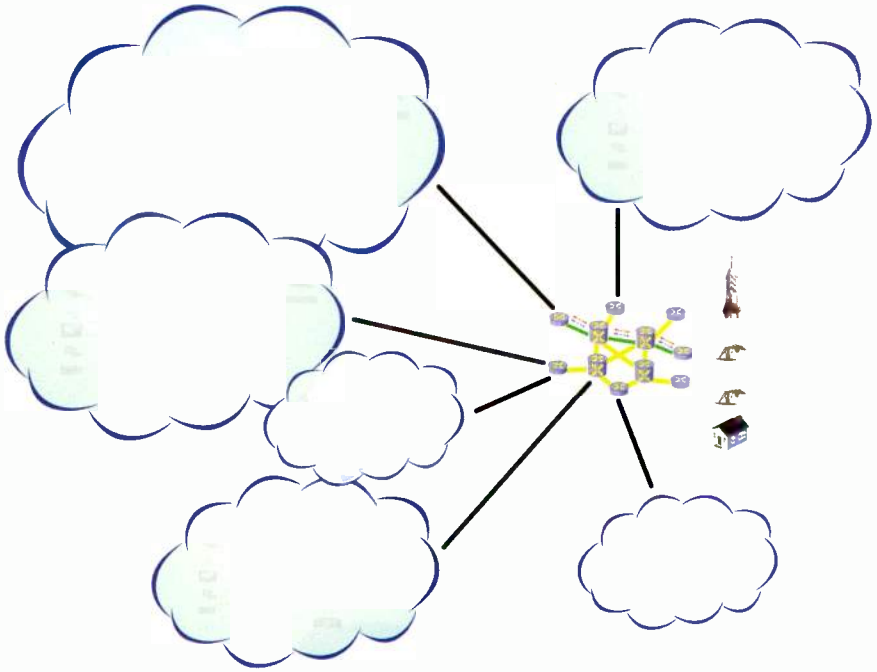


Figure 3. Distribution outlets pick up feeds and content from anywhere worldwide.

ago. To most outsiders today, video simply comes from a cloud hanging somewhere — the same way we used to put transport clouds into our system drawings.

This means that we as broadcasters are now clouds in the media outlet's systems drawings, as shown in Figure 3. Broadcaster clouds could be located anywhere in the world. They could be huge operations or a small niche channel. They could be a narrowcast operation for digital signage or a corporate private network that requires global distribution. The possibilities go on and on. Think of the new revenue opportunities for us as broadcasters. We can start to supply content almost anywhere in the world. Naturally, content rights needs to be geo-managed as we currently often do between East and West Coast operations within North America. The content we supply as cloud providers may be live streaming or file-based or both.

Reaping the benefits

To reap maximum benefit from this role reversal, we need to move beyond our traditional thinking of sending signals to a transmitter and cable satellite headends. Some of this has started now with mobile TV, with the addition of another program path tailored for mobile users. Similar techniques can be used to pick up additional revenue streams by creating a digital signage business within your facility. TV stations can use their skill sets to produce new and innovative content that sells and goes well beyond local news and sports by production.

It is the traditional thinking that is hurting our growth. We still think there are separate functions within a facility that are based on both workflow and signal flow, such as post area, traffic and billing, playout, transmission, news, and graphics. In some cases, they actually are separate departments; in other cases, they are

Always the Best. Now Even Better.

The UTAH-400 Digital Router is Better than Ever.

The UTAH-400 Digital Routing Switcher from Utah Scientific, the first 3G compatible router, the first router to cover all sizes from 32x32 to 1056x1056 with a single family of models, and the first router to offer a full 1056x1056 system in a single rack, has long been established as the industry's best choice for any routing application.

Now, this amazingly flexible family offers a wide range of exciting new capabilities including MADI routing, embedded audio processing, integrated multi-viewer options, and H.264 monitoring.

Coupled with the amazingly powerful Utah Scientific control system which combines ease of use with comprehensive management and monitoring features, including SNMP, the UTAH-400 is even more clearly the best choice for your router requirements.

Utah Scientific is the worldwide leader in routing and master control systems.
Contact us today for full details on how the UTAH-400 can solve your routing problems.

10 Year WARRANTY The Best in the Business

Utah Scientific
www.utahscientific.com

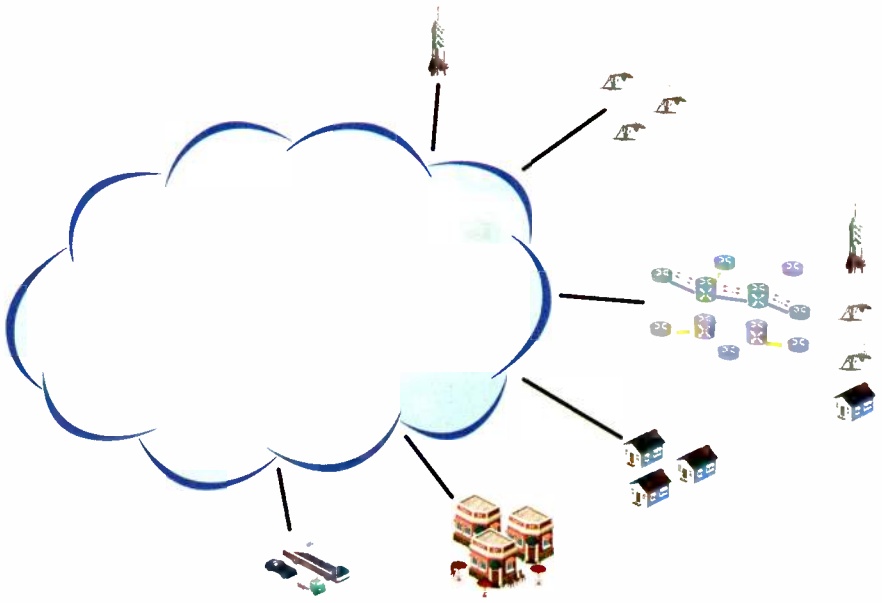


Figure 4. Taking control of cloud broadcasting by providing feeds tailored for each consumption outlet

simply a mindset.

Technology allows us now to think beyond this. Just as we see optical I/Os and processing functions going directly into routing switchers, we will begin to see single platforms that help us provide multiple distribution formats, such as various flavors of SD or HD MPEG, with some on ASI and others directly on IP streams. A single platform will break down the barrier between playout/master control and transmission within a facility.

Additionally, as shown in Figure 4, this means broadcasters start to take control of their own quality by providing streams and files directly in the format the distribution outlet needs. That's right; if a media outlet needs an SD MPEG-4 feed and another one needs an HD MPEG-2 for a transmitter, a single platform can provide this. Sure, it may be stat-muxed down the way, but we have skipped that extra step of rate conversion that often causes so much loss in quality. In doing so, we now have the ability to distribute some of our own content directly — not to cut the media outlets out of the loop but to enable services that generate new revenue streams.

Summary

As broadcasters, we know content is king. For that matter, even "the network cloud people" know this. But broadcasters need to find new and better ways to integrate with the network cloud people and seek out more and more ways to distribute our content. More specifically, we need to develop new models to take advantage of networking, along with new equipment and software, to better serve new distribution types directly — all while still delivering premium signals.

Whether we like it or not, this cloud role reversal is happening. Let's embrace it, taking "their" clouds into "our" clouds. Doing so will allow us to take control of quality driving distribution outlets, and most importantly, new revenue streams. BE

Stan Moote is vice president business development, Harris Broadcast.

The best lenses to express what you have in mind . . .

Extend your definition **40, 26, 19** and **now 14 times.** With Angenieux ENG HD Video Lenses.

40X 26X 19X NEW 14X

The extreme resolution of our HD Video Zoom Lenses lets you expand your range even further and wider than before. And now there's a new 14X wide angle zoom complementing our ENG family of 40, 26 and 19X lenses. Whether you use them together, or select the one zoom that takes you exactly where you want to be – in the studio with enhanced control kit compatibility, in the field on the latest lightweight HD cameras, and beyond – all four Angenieux HD Video Zoom lenses deliver the performance and quality to redefine the boundaries of your imagination.

Actual product images may vary

angēnieux®
a Thales group brand

973.812.3858
angenieux@tccus.com • www.angenieux.com

Equal Employment Opportunity

Now is the time to put your EEO house in order.

BY HARRY C. MARTIN

The renewal cycle for TV, Class A TVs, LPTVs and TV translators begins June 1, 2012, for Washington, D.C.; Maryland; Virginia; and West Virginia and continues until April 1, 2014. If your station's renewal applications are due next year, then now is the time to put your Equal Employment Opportunity (EEO) house in order because renewal submissions will include your annual EEO public file reports for 2011 and 2012.

Dateline

- Noncommercial TV stations in Indiana, Kentucky and Tennessee must file their biennial ownership reports on or before April 1, 2012.
- By April 1, TV and Class A TV stations in the following locations must place their 2011 EEO reports in their public files and post them on their websites: Delaware, Indiana, Kentucky, Pennsylvania, Tennessee and Texas.
- April 1 is the deadline for TV stations in Delaware and Pennsylvania to electronically file their Broadcast EEO Mid-Term Reports (Form 397) with the FCC.
- The license renewal cycle begins June 1, 2012, for TV, Class A TV, TV translators and LPTV stations in Washington, D.C.; Maryland; Virginia; and West Virginia. In these states, on April 1, 2012, TV, Class A TV and LPTVs that originate programming must begin their prefiling renewal announcements. The renewal cycle continues region by region until April 1, 2014, when stations in Delaware and Pennsylvania will be the last to file for renewal.

Rule applies to all full-time openings

The EEO rule applies to all full-time openings. Recent cases make it clear that for every full-time job opening, broadcasters must notify multiple recruitment sources that are likely to refer applicants from diverse backgrounds. Exclusive reliance on over-the-air announcements and Internet postings will not do the trick. Neither will reliance on word-of-mouth or unsolicited walk-ins. And, of course, all notification activities must be documented in the annual EEO public file report.

In one recent case, the licensee failed to include its annual EEO public file reports for the two years prior to filing of its renewal application. The Media Bureau wrote to the licensee, asking for those two reports, and also asked the licensee to send along reports for three other years.

The reports showed that there were 29 vacancies during the five-year period covered by the reports. For six openings, the licensee relied only on "walk-in/mail-in" applicants. For another seven, it relied exclusively on postings on Internet websites. For 15, it relied strictly on over-the-air-announcements. This record, the FCC said, evidenced rule violations because the licensee "failed to use recruitment sources sufficient to disseminate information concerning the vacancies as required."

The licensee also failed to produce records of the number of people it interviewed for each opening or the recruitment source from which each interviewee learned of the opening. (This requirement applies only to applicants who are interviewed, not to all applicants.)

The fine assessed was $20,000 — $16,000 for failing to recruit properly, $1000 for failing to keep required records, $2000 for incompleteness of public file reports and another $1000 for failing to adequately analyze the effectiveness of recruitment efforts.

In a second case, a licensee was the subject of the FCC's random audit process. During the two annual reporting periods studied, the licensee had 24 full-time vacancies. For three openings, it relied on walk-in applicants, and for one opening each it relied on, respectively, word-of-mouth, a business referral and an employee referral. The licensee noted that it broadcast generic recruitment ads that promote different careers in broadcasting even when there were no openings. The public file report in one year failed to list job titles for seven vacancies, classifying them as "other."

The FCC assessed a fine of $8000 — $5000 for failing to recruit properly, $2000 for incomplete public file reports and $1000 for inadequate analysis of recruitment efforts.

Stick with the rules

Licensees are still required to publicize every full-time opening to *specific* recruitment sources even though there is no requirement that any of these sources ever refer any job applicants (although licensees should substitute new sources for unresponsive ones). Also, the FCC still requires that any recruitment source that affirmatively requests to be notified *must* receive notifications of all openings. BE

Harry C. Martin is a member of Fletcher, Heald and Hildreth, PLC.

? Send questions and comments to: harry.martin@penton.com

New
HD-SDI Scan Converter with Genlock and Region-of-Interest Support at $1495

Broadcast Skype, YouTube, Google Earth, and mobile phone videos easily and economically

matrox Convert™ DVI Plus

NABSHOW
Where Content Comes to Life

Visit us at NAB: booth SL2515 Contact us today for the name of a dealer near you.
1.800.361.4903 (US and Canada), 514.822.6364, www.matrox.com/video

matrox
Digital Video Solution

HD interfaces

DisplayPort and HDMI are becoming preferred technologies for use with video displays.

BY ALDO CUGNINI

Late last year, Intel announced that it plans to end support for the VGA and LVDS specifications on display interfaces, in favor of HDMI and DisplayPort. While this news primarily affects PC displays and consumer TVs, it will also have an impact on video and audio interfaces on professional displays, this month's topic.

Evolving need for video bandwidth

The primary interfaces for handling video on professional equipment are the analog RGB, YC_bC_r and CVBS (composite), and the digital SDI, HD-SDI and 3G-SDI; MPEG transport streams are carried by DVB-ASI as well. Because the display market is driven primarily by consumer display technology, equipment development tends to start in the consumer space, with "narrower" applications like broadcast and production following, albeit with professional specs and features.

Hence, consumer displays began with analog CVBS and VGA connections and evolved up to the analog/digital DVI, digital HDMI and now DisplayPort interfaces. At the same time, professional displays, needing to interface to professional equipment, started with analog and evolved up to SDI. But now, HDMI is beginning to appear on professional displays, especially for use with cameras. The growing use of DSLRs for production capture has similarly increased the need for HDMI interfaces.

Because the marketing of consumer equipment is sensitive to pricing (read: bill of materials), manufacturers during the product development process are faced with a constant struggle between adding more functionality and lowering cost. For this reason, a single "universal" interface would be preferable to the sea of connectors often seen on consumer equipment. Because much of the functionality of CE equipment is dependent on the state-of-the-art of silicon, manufacturers are thus motivated to work with integrated circuit manufacturers to push product evolution in the direction of interface simplicity/sophistication, and many of the same chips used in consumer equipment have found their way into pro monitors as well.

DisplayPort

The mix of manufacturers wanting to move on from analog VGA interfaces includes AMD, Dell, Intel, Lenovo, Samsung Electronics LCD Business and LG Display. All of these have announced the desire to adopt scalable and lower-power digital interfaces into PCs. At the same time, low voltage differential signaling technology (LVDS) is being replaced with DisplayPort for digital interfaces as well. LVDS was developed as a low-power general-purpose digital interface standard that carries signals on a twisted pair within a device. Such an interface was thus used to transport digital video signals between, e.g., the motherboard and the flat panel for a laptop PC.

But DisplayPort is becoming a preferred choice over LVDS, according to Intel, because of power advantages, bi-directional communications capabilities and design efficiency benefits. In fact, Intel plans to end support of LVDS in 2013 and VGA in 2015 in its PC client processors and chipsets.

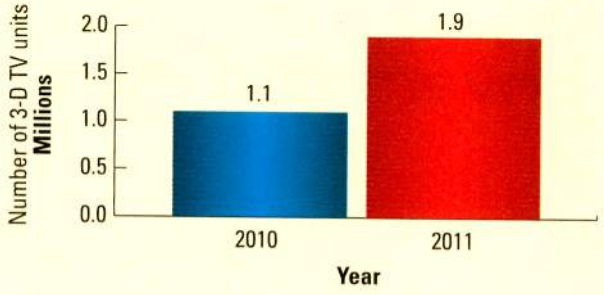
To carry video between equipment and flat-panel monitors, HDMI and DisplayPort are becoming preferred solutions. As of version 1.2, DisplayPort has a maximum data rate of 21.6Gb/s, can run on cables up to 15m in length and supports multiple color spaces including *xvYCC*, *scRGB* and Adobe RGB 1998. It is also capable of transporting multiple audio/

FRAME GRAB

A look at tomorrow's technology

3-D TV sales continue to increase

This year, 3-D TV unit sales are expected to grow 67 percent to 1.9 million units.

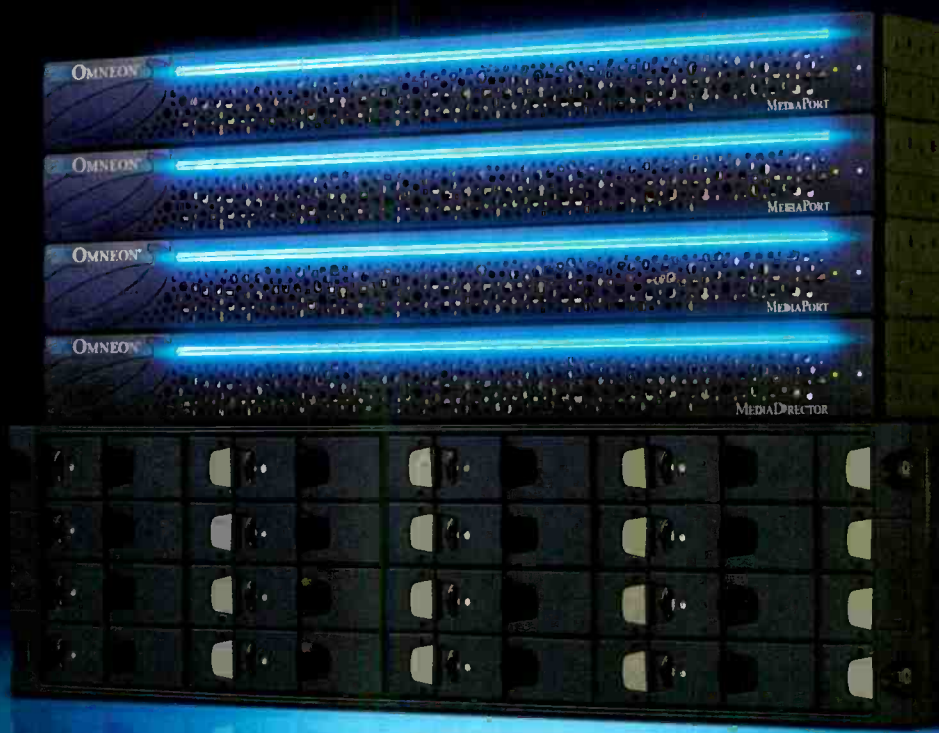


Source: Consumer Electronics Association

www.ce.org

When you need **proven performance** and **reliability** from a media server...

Spectrum **Delivers.**



Omneon offers you an easy, no-compromise choice.

With years of reliable service in hundreds of installations, the Omneon Spectrum™ media server system sets the value standard for television production, playout and archive applications. As the industry's most scalable, reliable and cost-effective solution, it delivers unprecedented flexibility for your evolving broadcast environment. Everything you demand...**Spectrum Delivers!**

www.omneon.com

For details, go to www.omneon.com/SpectrumDelivers
or call us at 1-866-861-5690

OMNEON®
NOW PART OF HARMONIC

video streams, supports bi-directional data transfer, has a global time-code (GTC) for audio synchronization and provides an AUX channel with a bandwidth of 720Mb/s, which can carry Ethernet, USB 2.0, DPMS and other types of data. When carrying video over an internal connection, a version of DisplayPort called Embedded DisplayPort (eDP) can be used.

HDMI

HDMI encoding includes support for 4:4:4 RGB, as well as 4:4:4 and 4:2:2 *YCbCr* color spaces. The 4:4:4 format is 8 bits per component, and the 4:2:2 format can be up to 12 bits per component for greater color depth. Version 1.4 of the HDMI specification runs at up to 10.2Gb/s, supporting up to 1080p video, and adds support for three additional color gamuts.

In addition to *xvYCC* color space and Deep Color, this latest HDMI standard now offers native support for *sYCC601*, Adobe RGB color and Adobe *YCC601* color. At the physical level, HDMI uses transition-minimized differential signaling (TMDS) instead of LVDS, which enables it to drive longer cables, but still at a low power consumption.

HDMI offers some functionality that does not exist with DisplayPort, such as support for Consumer Electronics Control (CEC) signals (used for remote control functions), electrical compatibility with DVI, and an Audio Return Channel (ARC) that simplifies cabling by allowing, for example, a display with a built-in tuner to send audio back to another device. Both HDMI and DisplayPort can carry audio as well, with up to eight channels of 192kHz, 24-bit uncompressed audio, as well as any of the common compressed audio formats, such as Dolby or DTS.

Both interfaces also support High-bandwidth Digital Copy Protection (HDCP), preventing the unauthorized copying of content on the interface. DisplayPort, however, can provide DPCP DisplayPort Content Protection (DPCP) as well. Although some manufacturers speak of "Wireless HDMI," there is in fact no standard for such an interface, with proprietary products emerging that wirelessly interconnect HDMI sources and sinks. But, a multi-gigabit wireless DisplayPort specification is said to be in the works.

Conclusion

The USB interface has evolved over the years as well, to the point where version 3.0 can carry up to 4.5Gb/s serial data, which is enough for uncompressed 1080i, or 1080p60 at eight bits; 1080p60 at 12 bits is just outside its capability. Even the earlier version 2.0, at 480Mb/s, can carry compressed video, which has resulted in USB adapters for such a purpose. Wireless USB is also available, operating at a speed of up to 480Mb/s at distances up to 3m, and operating in 14 bands in the 3.1GHz to 10.6GHz frequency range.

But USB has always been a *universal* interface to be used with a wide variety of products, including those outside of the video and audio realm. For that reason, it is likely that HDMI and DisplayPort, with their many video-related capabilities, will remain the most practical (and hence widespread) technologies for use with video monitors. BE

Aldo Cugnini is a consultant in the digital television industry.

? Send questions and comments to: aldo.cugnini@penton.com

Q:WHAT DO YOU CALL PEOPLE WHO COMPLAIN ABOUT YOUR AUDIO?

A:YOUR BEST CUSTOMERS.

Recipient of the
62nd Annual NATAS Technology
and Engineering Emmy® Award.

See the new 2RU AERO.air™ and the latest DTV audio solutions at NAB 2011. **VISIT US AT BOOTH #SU3326.**

For every viewer who takes time to complain, there may be a thousand who just leave. Let's fix this. We've been solving DTV audio problems since before loudness complaints. From production to transmission, our products are built for one purpose – digital audio perfection. Find it in the AERO.air™ when you visit our website. Your critical customers will thank you for it (hopefully at under -24LKFS).

www.LinearAcoustic.com

LINEAR ACOUSTIC®

Live video transport

New and emerging standards provide interoperable professional video over IP transport.

BY BRAD GILMER

Getting live video from a venue back to a studio has been a common requirement for many years. Increasingly, video over IP is the backhaul technology of choice.

There are a variety of professional video over IP contribution standards either already in place or under development. The genesis of these documents was the Pro-MPEG Forum. These standards, incubated in the Video Services Forum, and formally standardized under SMPTE, all fall under the SMPTE 2022 multipart standard. Various parts are signified by a dash after the standard number, e.g. SMPTE 2022-1, 2022-2 and so on. A comprehensive view of the 2022 family of standards is shown in Figure 1.

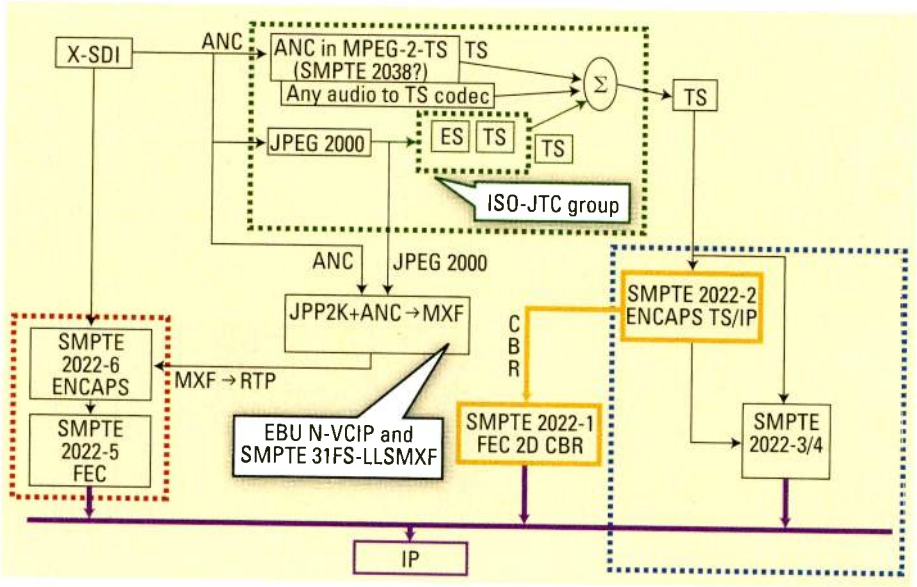


Figure 1. A comprehensive view of the SMPTE 2022 family of standards for professional video transport

In these standards, a number of network protocols are used to transport professional video over IP. At the data link layer, by far the most common technology in use today is Ethernet over SONET. At the IP layer, the dominant standard is IP. These standards — SONET, Ethernet and IP — all are well established and are very common for all IP-based applications. It is above this layer that we see some specialization for professional video transport.

At Layer 3, the 2022 standards specify User Datagram Protocol (UDP) and Real Time Protocol (RTP). UDP is used to deliver datagrams, and RTP is used both to convey timing information about the individual packets, and to provide a mechanism that can be used by Forward Error Correction (FEC) to recover lost packets.

The published 2022 standards (2022-1, 2022-2 and 2022-3) all rely upon MPEG-2 transport streams (TS) and higher level MPEG compression and synchronization mechanisms to transport professional video. Some future standards in this family will move away from MPEG-2.

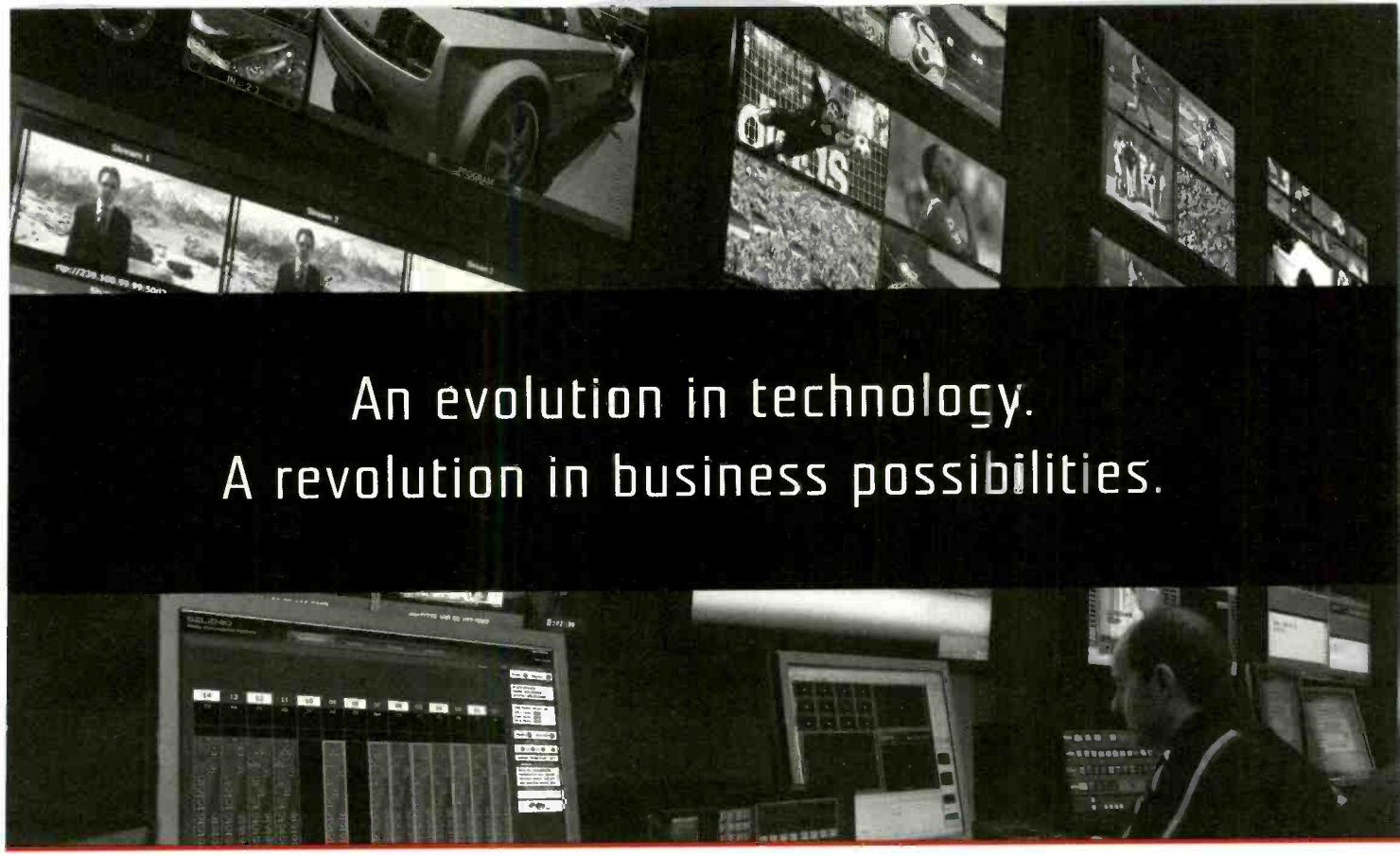
SMPTE 2022-1 and 2022-2

Together, SMPTE 2022-1 and 2022-2 provide a mapping of MPEG-2 TS onto IP networks, with an associated standardized FEC mechanism. 2022-1 describes the FEC, and 2022-2 describes the mapping of the MPEG-2 TS onto IP. Almost all equipment currently manufactured for professional video transport of contribution SD-SDI streams on IP networks conforms to SMPTE 2022-1 and 2022-2. If we spend a few minutes to understand SMPTE 2022-1 and 2022-2, this will help us understand the rest of the family.

If you look in the upper right-hand portion of Figure 1, you will see that we start with an MPEG-2-compliant TS. This TS typically contains video, audio and ancillary data. 2022-1 and 2022-2 assume that video, audio and data have been previously compressed into an MPEG-2 compliant bit stream. The documents also assume that this TS is a constant bit rate (CBR) stream. As the figure shows, 2022-2 describes how to map this stream onto an IP network using UDP and RTP.

Optionally, this IP stream may employ an FEC mechanism that is defined in SMPTE 2022-1. This mechanism allows for recovery from errors during transmission. The FEC scheme is designed to protect for, at most, a 3ms outage because experience has shown that beyond this limit, IP networks employ other means of protection. In other words, for a backhoe fade where a fiber is cut after the 3ms outage, the network will automatically reconverge on another route, or the network operator will begin to recover from the failure using some other means.

In summary, 2022-1 and 2022-2 are for professional transport of CBR



An evolution in technology.
A revolution in business possibilities.

The Selenio™ Media Convergence Platform

Every day our industry accelerates its migration from a traditional, broadcast model to a more flexible, efficient IP-based workflow. Productivity demands it — and new revenue is reliant on it.

Enter Selenio™. The industry's first media convergence platform.

With Selenio, baseband video/audio processing, compression and IP networking are combined into a single, scalable, space-saving platform.

So go ahead. Expand your channel portfolio. Make that transition to HD. Or move into web/mobile services. Selenio enables you to add new services confidently and cost effectively.

See Selenio at the NAB Show, Booth #N2502, or at www.harrisbroadcastlive.com.

SELENIO™
MEDIA CONVERGENCE PLATFORM

DRAWING THE NEW LINE

harris.com

HARRIS®
assuredcommunications®

MPEG-2 transport streams. These standards cover CBR only. In a CBR stream, the bit rate does not vary.

SMPTE 2022-3 and 2022-4

The group working on the 2022 family of standards recognized that there may be cases where a user would like to transport variable bit rate (VBR) MPEG-2 transport streams. 2022-3 and 2022-4 are VBR mapping documents; they are based upon 2022-2.

The group quickly identified two different use cases for VBR contribution feeds. The first case is called Piecewise Constant VBR (2022-3), and the second is called Non-Piecewise Constant VBR (2022-4). In Piecewise Constant VBR (2022-3), even though the bit rate varies over time, the receiving application can assume that the MPEG TS packet pacing is equally distributed between PCRs and can recreate the packet timing exactly as it was presented to the input of the transmitter. This means that between any two successive PCRs, the signal is CBR at a specific bit rate for that period of time. Between the next two PCRs, the bit rate will also be constant for that period of time but will be at different bit rate. Because the CBR rate can change at every PCR, the result is that the long-term bit varies over time.

2022-3 provides two options for sending a VBR stream. One option sends datagrams into the network at a constant rate, regardless of whether datagrams are full of TS packets or not. This achieves the required result, but is less efficient because some packets are not full. The second option only sends datagrams into the network when they are full of TS packets. Because the intial bit rate is variable over time, the resulting datagram rate will be variable over time. In 2022-4, Non-Piecewise-constant VBR, the incoming stream to the transmitter does not provide equally distributed packets between PCRs (usually because one or more programs in a MPTS have been removed). In this case, the original pacing of the incoming stream is lost. The 2022-4 standard provides a method of signaling the original packet timing to the receiver to ensure that the interpacket timing of the original signal can be maintained.

In summary, 2022-3 and 2022-4 both build upon 2022-2 and add the capability to deal with VBR MPEG-2 transport streams. There are two VBR documents because we have identified two different use cases for VBR transport.

SMPTE 2022-5 and 2022-6

As this group has continued to evolve, user demand has grown for uncompressed, full bandwidth professional video transport. SMPTE 2022-5 and 2022-6 address this requirement. These standards are meant to transport high bit rate media over IP. By high bit rate, we mean uncompressed video at rates from 270Mb/s up to 3Gb/s. The transport carries not just active video, but the entire video signal, including VANC and HANC. These standards are intended to transport uncompressed video, although at some point in the future, a user might employ them to transport professional video wrapped in a container such as MXF.

User demand has grown for uncompressed, full bandwidth professional video transport.

As Figure 1 shows in the upper left-hand corner, if a user has an uncompressed SDI stream, that stream may be mapped onto an IP network by using 2022-6. 2022-5 describes an optional FEC mechanism to protect the stream. The FEC matrix size is enlarged over that of the 2022-1 matrix to accommodate the higher bit rate. The RTP header in IETF RFC 3550 is used, and the FEC header is based on IETF RFC 5109 with expansion to accommodate the extension of the error correction scheme.

Future work – JPEG 2000

We have identified an additional user requirement — the ability to transport JPEG 2000 on IP networks. The group has identified two mechanisms for this use case — transporting the JPEG 2000 in an MPEG-2 TS stream, and transporting the content wrapped in an MXF wrapper. Looking again at Figure 1, starting with an SDI stream, video can be compressed using JPEG 2000. One of the challenges in transporting JPEG 2000 is that audio is not addressed as part of the JPEG standard. So, in the case of a TS, a standardized mapping of the JPEG 2000 code stream to MPEG-2 TS has been recently completed. One way to handle audio would be to include it in an ancillary stream and compress it using MPEG-2. There are several other ways to create standardized compressed audio streams, and the 2022 transport documents do not care what the mapping is as long as the result is a legal MPEG-2 TS.

Once the JPEG 2000 is encapsulated as a TS, the user can employ 2022-2 to map the stream onto an IP network. Alternatively, as shown in the center of Figure 1, the JPEG 2000 video plus audio as ancillary data could be mapped into an MXF wrapper. Once wrapped, it is conceivable that this stream could be transported using 2022-6.

Status update

As of the writing of this article, SMPTE 2022-1, 2022-2 and 2022-3 are published SMPTE standards. 2022-4, 2022-5 and 2022-6 are working their way through the standardization process. The committee is preparing to begin work on JPEG 2000.

Brad Gilmer is President of Gilmer & Associates, executive director of the Advanced Media Workflow Association and executive director of the Video Services Forum.

? Send questions and comments to: brad.gilmer@penton.com


Spending too much to build, scale and maintain a shared storage infrastructure?
Require access to large digital repositories to take advantage of their business value?
Need to support a diverse set of applications, protocols and platforms?
www.Isilon.com/broadcast
With Isilon you can...
· Scale from 10 terabytes to 10 petabytes with a single file system for all media workflows
· Reduce costs by eliminating SAN complexity and administrative overhead
· Improve performance by digitizing and processing more content online
Customers
· The Moving Picture Company
· Sony Pictures Imageworks
· NBC Universal
· Canadian Television
· 3ality Digital Systems
ISILON® SYSTEMS
Visit us at NAB Show 2011 April 11-14 Booth #SL11614

Mobile DTV widgets

Widgets provide a flexible tool for distributing content alongside Mobile DTV audio/video channels.

BY PETER MATAGA

The standardization of a mobile/handheld-oriented digital television technology represents one of the most exciting recent developments in North American broadcasting. ATSC Mobile DTV (A/153, also known as ATSC-M/H) provides a backward-compatible, robust mechanism for transmission of digital television to power-constrained moving devices. In 2011, Mobile DTV is emerging from trials and tests into full-fledged market deployment and commercial device availability, as evidenced by announcements from the Mobile Content Venture (MCV) and its Pearl partners, from the Mobile 500 forum, and with significant commitments by the Corporation for Public Broadcasting and PBS member stations.

While television on the go is clearly the target "application" of the original standard, the underlying, IP-based technology also enables a host of new services that go beyond traditional TV. For reasons that this article explores in more detail, the non-real-time (NRT) broadcast distribution of file-based content is one of the most important. Often referred to as mobile DTV widgets for short, a first step has been taken towards standardization of such services by the recent availability of the ATSC Non-Real-Time Content Delivery Candidate Standard.

While a user views a television program, a series of icons showing news, weather, sports and traffic information are also displayed.

Selecting the "headlines news" widget brings up a list of headlines and news articles.

Selecting an individual headline brings up the full news article.

Example user experience

Widgets provide broadcasters a powerful, flexible tool for distributing a variety of file and data content alongside Mobile DTV audio/video channels. This content may provide a standalone service to the user, or be loosely synchronized with a specific TV or radio channel. The bit rate required to deliver the content may vary widely, depending on the amount of data and the required acquisition time — anywhere from overnight push-of-video collections to almost-real-time stock ticker data or emergency notifications.

A good way to understand the power of NRT and mobile DTV widgets is to take a look at a typical consumer use case. In this scenario, a user is viewing a television program from a broadcaster. The user's device is able to discover that, in addition to the primary video stream, an associated set of secondary content services is available. A series of icons, provided by the content guide transmitted by the station, is displayed to the user — in this case showing news, weather, sports and traffic information.

Selecting the "headline news" widget brings up a list of headlines and news articles, which are also being broadcast over the air. The list of articles is continually updated throughout the day, and the user is alerted when new content arrives.

Selection of an individual headline

The Dimension-3D is a highly versatile device that converts any standard 3D format to another. It is a useful tool for numerous applications where content players interface with 3D displays.

Ideal for virtually all 3D and stereoscopic workflows.
Now with Full Resolution Frame Packing !

doremi™

Doremi Labs, Burbank, CA 818-562-1101
www.doremilabs.com

brings up the full news article. The full article contains images, complex layout, hypertext and other features that should be reminiscent of Web-based content consumption. One way to think of the delivery of the article is that a small piece of a website has been pushed to all devices listening to the broadcast, and then browsed in the same way that offline caching and browsing is possible in the Internet world. In the present example, in fact, a common implementation would be to deliver an RSS index file and a set of HTML files and graphics for each article.

The effect of the widget is that a passive, schedule-constrained mobile broadcast TV experience has been extended with Web-like, on-demand content all while leveraging the reach, economics and user experience of broadcast.

Just as importantly, the broadcast content need not be completely self-contained. In the example scenario, the article can contain links to Internet-accessible additional content, such as related stories, the broadcaster's own website or advertising click-throughs.

ATSC Mobile DTV background

Non-real-time services represent a relatively small addition to the functionality already in place in the ATSC Mobile DTV standard. Space doesn't permit anything like a full MDTV overview here, but it's worth reviewing the key features of A/153 that make this possible.

First, unlike ATSC, the mobile standard is IP-based. All content, A/V or otherwise, is transported as multicast IP packets encapsulated by the mobile preprocessor and embedded in the existing ATSC signal in a backward-compatible fashion. Figure 1 summarizes the protocol layering involved; almost all the protocols above the IP layer are taken from existing technology. This allows Mobile DTV to reuse existing standards and products for IP A/V delivery — that is, television and radio services — but also provides a foundation for any other services that can be based on IP multicasting.

The Mobile DTV standard focuses on TV services but has been designed to be extensible to other service types. Moreover, the standard already includes a service type based on file delivery. Part 4 of A/153 specifies an optional but recommended feature known as Announcement, which provides a service guide (SG), often also referred to as an Electronic Program Guide (EPG). For a TV service, the SG includes information about the channels and programs, including rich program descriptions, channel logos and so forth. The delivery technology is based on an Open Mobile Alliance (OMA) specification for SG delivery, which in turn makes use of an IETF standard for File Delivery over Unidirectional Transport (FLUTE).

The inclusion of the OMA SG and provision for signaling of FLUTE components in A/153 means that many vendors have already implemented a significant part of the functionality needed for non-real-time file delivery services. In addition, the SG itself provides a mechanism for announcing NRT services and content.

ATSC NRT

The ATSC Non-Real-Time Content Delivery Candidate Standard (NRT CS), published at the end of 2010, provides a unified approach to NRT file delivery for both existing ATSC DTV transmissions (referred to as "fixed" for convenience in the NRT CS) and for Mobile DTV. There are differences in the way that the guide to services and content is provided in the two cases, but a common model for content delivery and consumption is followed.

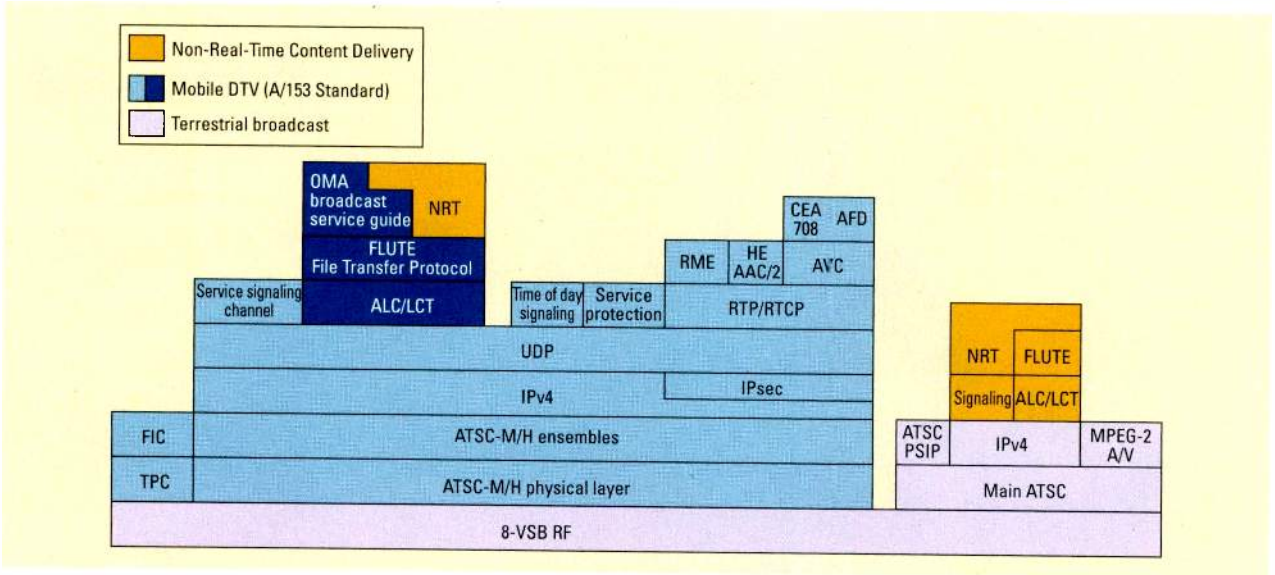
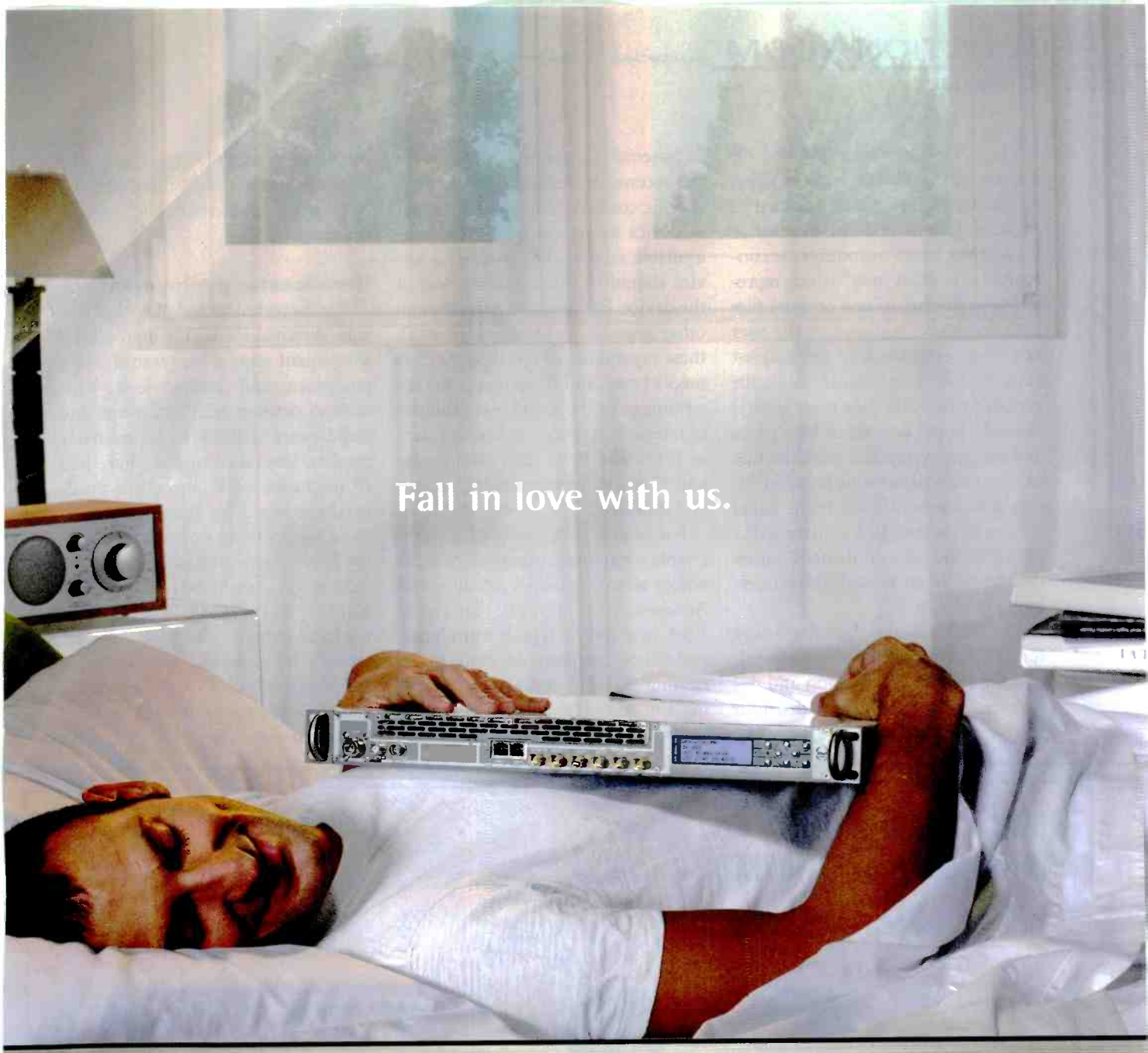


Figure 1. Mobile DTV and NRT protocol stacks



Find yourself in love with the new SDT ARK-6 Series.

Since the beginning we have been motivated to be a step ahead in technology and solutions in our field. This is why we have been heavily investing in Research & Development with energy and enthusiasm. Today we are proud to present the new SDT ARK-6 Series: intelligent and versatile, with DVB-T2 and ATSC-MH native technology, compact with TS-MPEG or T2-MI input over ASI or IP, both Linear and Non-linear adaptive pre-correction, 50V transistor technology, either air or liquid cooling options. Ranging from 2.5W RMS to 18kW RMS, the new SDT ARK-6 Series is a perfect solution to today's needs, as well as an extraordinary asset for tomorrows. The SDT ARK-6 Series, it is impossible not to love it.

NABSHOW *Where Content Comes to Life*

April 11-14, 2011
Booths: SU6321 - OE1371

ScreenService AMERICA IT WORKS.

SCREEN SERVICE AMERICA Llc
6095 NW 167th Street, Suite D-10, Miami, FL 33015, USA
Phone: +1 (305) 826-2212, USA Toll Free 1-888-522-0012
www.screenservice.net • info@screenservice.net

RRD USA Inc
350 5th avenue, suite 3600,
New York, NY, 10118, USA
Phone 1: +1-212-695-8378
www.screenservice.net • info@rrdus.com

The CS makes use of IP-based file delivery using FLUTE, which allows files to be segmented, transmitted in packetized form and reassembled at the receiver. It also introduces the concept of a "content item," which represents a collection of one or more files intended to be rendered to the user as a single experience. In the simplest case, this could be a single media file such as a video clip, but a more general example would be a set of Web pages and associated graphical resources that can be downloaded and browsed locally on a receiver device. In the initial version of the standard, content is displayed to the user on demand rather than being tightly synced with rendering of broadcast TV.

The NRT CS also specifies a way for NRT services to be announced, and for content information and delivery schedules to be provided to a receiver. In particular, the signaling of "essential capabilities" required for the receiver to render a service or a specific content item allows a receiver device to determine not only the available services, but whether a service should be offered to the user of the device. For the most part (though other aspects are involved as well), these capabilities can be thought of as media types, and the intent is to take advantage of the existing capabilities of receivers in rendering content such as JPEG and PNG files, MP3 Audio and H.264 video clips, HTML pages, and RSS feeds.

For Mobile DTV, the NRT CS represents a reuse and extension of technology already in use for Signaling and Announcement purposes. (See Figure 1.) A new service type is introduced, and minor extensions are made to the existing FLUTE component signaling. Content items are delivered using FLUTE (with some extensions introduced to group files together). The XML elements within the OMA SG have been extended with NRT-specific information.

Broadcaster deployment

For the technical and historical reasons sketched above, the incremental investment required by transmission equipment and receiver device vendors to develop NRT platforms and middleware is likely to be relatively modest. Several companies have had IP multicast server and client product lines based on the FLUTE protocol for a number of years, including applications to mobile broadcast technologies such as DVB-H, MediaFLO and MBMS. Pre-standard implementations of M/H widget services have already been deployed, and Harris, KLAS-TV, LG Electronics and Roundbox recently demonstrated an interoperable ATSC-NRT-CS-

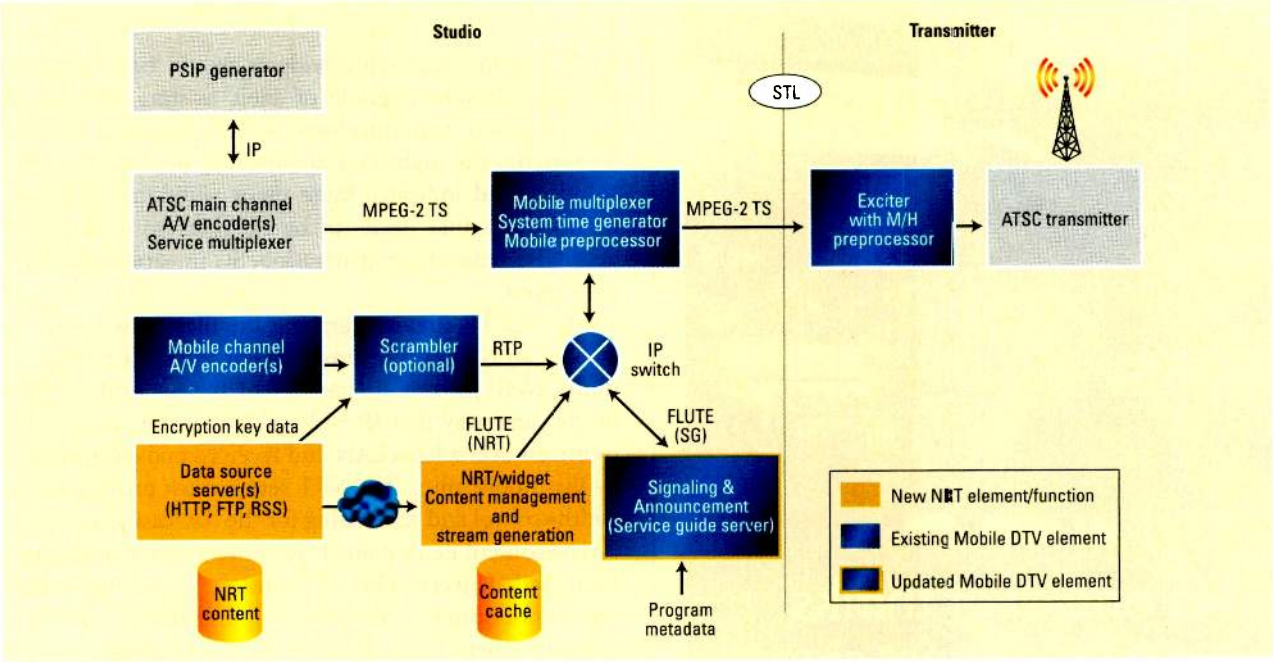


Figure 2. Mobile DTV widgets transmission elements

compliant coupon delivery application over the air at CES 2011.

Because NRT services piggyback on the multicast transport intrinsic to ATSC Mobile DTV, deployment involves an incremental, relatively low-cost enhancement of the infrastructure broadcasters have already put in place for Mobile DTV. For

most stations, deploying widgets would be a straightforward software upgrade of their existing ATSC-M/H Signaling and Announcement servers. Figure 2 on page 35 sketches the high-level architecture of a Mobile DTV solution, and indicates three main additional functions or interfaces that need to be provided to enable widgets: NRT data stream generation, SG integration and file data ingest.

The FLUTE streams carrying the files must be generated by an NRT server function. For the most part, these multicast IP streams are handled by the rest of the system in the same way that IP audio/video streams are for TV: multicast over a local LAN and received and encapsulated by the mobile mux. The NRT server must provide bandwidth control and scheduling for the datacast streams.

The content items being transmitted, and their descriptions and delivery schedule, must be coordinated with the Announcement Server generating the SG, and the Announcement Server functionality must be enhanced to include the NRT content guide functions. For this reason, the NRT Server and Announcement Server will often be software modules on the same physical server.

The reuse of Web-oriented systems in the back end of an NRT solution is more than a technology nicety.

Finally, the NRT server must be able to ingest the files and their metadata (including schedule) from one or more data sources. This back end aspect is not standardized by the NRT CS. A content management system could be built into the NRT server, but a more common approach is for the files to be populated in a remote system that can be accessed using familiar protocols.

Leveraging station Web investments

The reuse of Web-oriented systems in the back end of an NRT solution is more than a technology nicety. Basing widgets on Web technologies can immediately extend a station's Web business investments. *AdWeek*, quoting Borrell & Associates, noted that in the last few years, station Web properties have become a billion dollar business in aggregate and continue to grow at more than 50 percent year over year.

As a result, broadcasters have significant expertise in packaging, delivering and selling advertising against Web-based content. Mobile DTV widgets take this experience and provide stations new carriage over an old medium — broadcast. Moreover, because the broadcast widget content can include links usable by an Internet-connected receiver device (and most mobile devices will

have Internet access via 3G/4G or WiFi networking), it should be thought of as a hook to pull users into richer, targeted and monetizable interactions at a broadcaster's or advertiser's website.

Specialized applications

The ATSC NRT CS provides a framework for interoperable distribution of content, with the primary goal of allowing a wide range of receiver devices to display collections of more or less arbitrary content compiled by the broadcaster. It is also possible to employ the NRT machinery in more specialized ways for specific public service or commercial uses of broadcast spectrum. Such applications may be operated directly by a broadcaster, or be part of a business model in which Mobile DTV bandwidth is leased to a third party.

Mobile DTV widgets can be quickly deployed alongside traditional TV services to deliver consumers the on-demand, Web-like content services they love.

An obvious use case for widgets is the delivery of emergency alert material to broadcasters' communities. The Emergency Alert System (EAS) recently standardized a new, nationwide alert format known as the Common Alerting Profile (CAP). Because EAS-CAP alerts leverage a variety of Internet technologies, they can easily be integrated with Mobile DTV widgets to support widely deployed broadcaster initiatives such as Amber Alerts.

Conclusion

Mobile DTV Widgets are a powerful new opportunity for stations to use broadcast technology to deliver more than TV. By leveraging station investments in and consumer familiarity with Web content, Mobile DTV widgets can be quickly deployed alongside traditional TV services to deliver consumers the on-demand, Web-like content services they love, in a way that takes advantage of the reach, economy of scale and congestion-free character of the broadcast system.

Given the new generation of media consumers and their favored devices, NRT technology provides broadcasters not only an extended audience for TV, but also opportunities for new, revenue-generating services that integrate the best of the Web, mobile and broadcast technologies. BE

Peter Mataga, Ph.D., is CTO of Roundbox.

Metadata

Workflow can be enhanced enormously through the effective use of metadata.

BY SIMON ELDRIDGE

Metadata is a critical component in implementing an effective and efficient broadcast workflow because this core information about your content is what allows you to organize, locate, process and manage that content according to business rules.

Metadata is essentially data about data. In the case of broadcast workflows, it is data about video content.

Types of metadata

Multiple types of metadata come from different sources and can be used in different ways, each contributing to the efficiency of your overall workflow.

Structural metadata refers to the physical properties of the content: format, bit rate, resolution, file size, creation date, etc. This information may be obtained "for free," as it is contained within the video or wrapper itself without user intervention or input. One analogy is the EXIF metadata in photographs — date taken, picture size, file size, GPS data (if available), camera make and model used — automatically recorded by cameras within images as they are captured. All of these details can be useful in categorizing and organizing recorded media.

You can use structural metadata to segment your library of content and organize it into logical groups. You could, for example, filter the view based on format (SD or HD), time since creation or aspect ratio. The ability to filter content and create virtual groups is essential for organizations managing large volumes of content, and it is also valuable in filtering content views for different functional groups so that they see only the content that pertains to their work.

Descriptive metadata is data that is entered into a system by operators or external applications. Unlike structural metadata, it cannot typically be generated automatically or derived from the properties of the content itself. Descriptive metadata is generated by one or more processes and maintained in some form of enterprise-wide database. It often stores content-specific information such as shot-logs, descriptions, actors, locations, directors and scene-specific information. It can also store business-specific information such as content usage rights, availability windows, planning and distribution information, and workflow process stage.

The ability to filter content and create virtual groups is essential for organizations managing large volumes of content.

When descriptive metadata exists in multiple systems throughout your enterprise, it becomes difficult to get a federated view of all that data. Automation systems, traffic and planning systems, archive systems, production systems, and media asset management (MAM) systems frequently contain differing subsets of data that are relevant to their particular responsibility for managing and processing that content. By employing a MAM system, you can harvest data from these sources and view it in a consistent, federated model.

Storing metadata

As descriptive data is largely free-form, creating and storing it "as is" results in large collections of unstructured data that are impossible to use and manage efficiently. To ensure that stored metadata meets the requirements of all dependent users and third-party systems, you can use a data-modeling exercise to define the type of metadata you want to store, the structure of that data and clear taxonomies (language, synonyms) for specific data fields. Specific data fields can apply to entire assets, to clips or subclips (scenes), and even to specific frames of video.

This modeling exercise typically involves surveying all potential users of the system to create a master set of required data fields and valid values. The master set also can include a federated and normalized list of data fields taken from legacy systems.

By standardizing how content is described and how that content data is stored, you can facilitate effective content searches farther down the chain and, in turn, access data and make business decisions about content in a consistent and productive manner. Ideally, this process is performed up front, but it's important that the system allow for changes to the data model as the organizational processes and requirements change over time.

You can store both structural and descriptive metadata hierarchically in order to best represent the model of the content, as well as the desired use of the metadata by your organization. For example, some metadata may be applicable for the entire clip, and some might only be applicable to a particular scene (subclip). Some metadata might be applicable to a

modular flexibility
best-in-class performance
proven reliability

World class products for world class operators. Sencore technology meets the needs of modern media providing video delivery solutions for a wide range of applications:

- Advanced satellite modulation: 8 PSK, 16 APSK, 32 APSK
- H.264 to MPEG2 or MPEG2 to H.264 transcoding
- Transrating
- High density MPEG2/H.264 decoding

Transcoder TXS 3453
Modular Receiver/Decoder MRD 3187B
Satellite Modulator SMD 989

This is just a sample of the solutions Sencore has to offer. If you would like additional information or would like to arrange a free field demonstration, please contact us at 605.978.4810 or at P.Jones@sencore.com today.

www.sencore.com | 605.978.4810 | p.jones@sencore.com

sencore

specific point in time, such as a particular video frame. Consequently, your data model should differentiate between metadata about clips, subclips, frames, clip sequences and even collections of clips.

You can also employ context-specific metadata structures that are related to other higher-level categorizations. For example, different types of content often are described in different ways in order to maximize the organizational capabilities of the system. Documentaries are described differently from sports or news content. Context-specific metadata allows these different metadata models to exist within the same system.

powerful tool you have for improving workflow efficiency.

In its entirety, the content life cycle defines the processes that content must pass through for its intended purpose, such as distribution to broadcast, Web and/or mobile. The life cycle may dictate digitization of content, followed by a quality check (QC), light editing for each distribution platform, editorial approval, format conversion and another QC before content is moved to the distribution platform.

Workflow

Figure 1 demonstrates a workflow taking a piece of content from

content is in its life cycle. Equally important, this metadata enables content to be filtered and further conditionally processed based on the outcome of the steps through which it already has passed.

While some of these processes can be automated and some require manual intervention, the harvesting of metadata about each of them will enable your workflow control system to automatically route content to the next process in the chain, and potentially trigger the next step in the life cycle. When manual intervention is required, metadata can be used to notify the appropriate users that the content is ready for them.

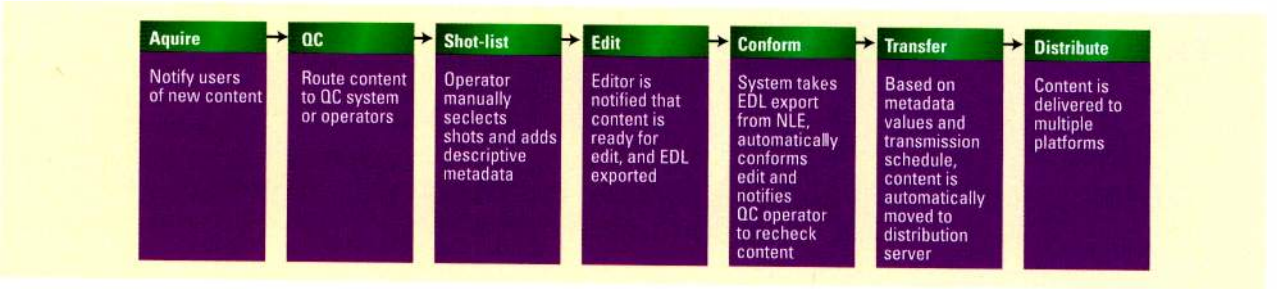


Figure 1. Controlling workflow using metadata

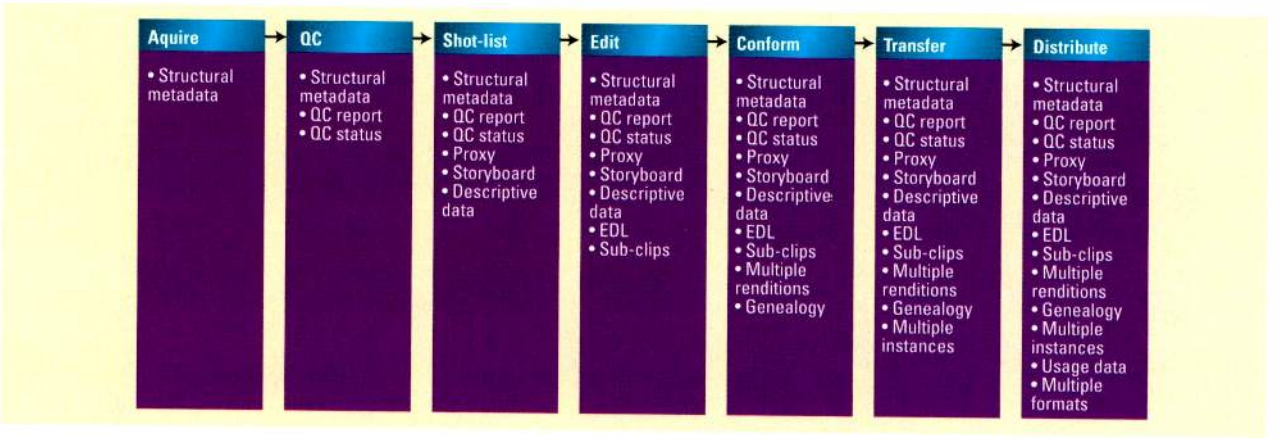


Figure 2. Metadata snowballing through a workflow

Metadata is valuable not only in the organization of content, but also in storage and in tracking of processes throughout its life cycle. Information about the content life cycle includes the status of the completed processes through which a piece of content has passed. This usage information, arguably a subset of descriptive metadata, is potentially the most

acquisition through to distribution. While each of these steps involves human intervention, metadata informs and guides these processes. Figure 2 identifies the increasing volume and variety of metadata that drives the workflow forward. Each step in this workflow creates additional metadata that, in turn, allows personnel across the organization to see where the

Consider this example. Ingested content is automatically registered and all of its structural metadata harvested. Depending on its intended purpose and corresponding life cycle (or workflow), it can be automatically routed for an automated file-based QC, with the results of that QC passed back to the metadata management system. If the content failed the QC, it

could be moved to a quarantine folder while an operator is notified that the content requires attention. If it passed the QC, it can be moved automatically to the production system and the editor notified that the content is available for manual processing.

Throughout this process, the workflow system can intelligently route and notify based on the growing amount of usage metadata it collects. As this metadata profile grows, you can use it to identify and resolve bottlenecks in your workflow. For example, if you have a manual QC step in your defined workflow, you could identify how long content waits to be checked prior to moving to the next step. If it takes too long, your organization can redeploy personnel from newly automated tasks in order to speed that manual process.

Metadata can be stored in an external database that references content. It also can be stored within the content itself, usually within the wrapper but sometimes within the essence itself, such is often the case with timecode.

Modern content wrapper formats such as QT or MXF reserve space in the clip header to store custom data about the content that is important to your business. Thus, when content is passed to another system, the data is passed along with it. One example would be content and data from a file-based video camera. Points of interest, or even subclips, marked by the operator during shooting are included when content is transferred from the camera. Inclusion of this logging information with content negates the need for content to be shotlisted again.

Storing metadata in an external database enables scalability.

Metadata embedded within the clip has the advantage of traveling with the content wherever it goes. As a result, this information is available to other systems throughout the workflow. It also is readily available with content shared with or sold to external users or companies. Unfortunately, reliance on embedded metadata also means that any metadata management systems must be able to parse the clip in order to access the metadata, and this approach has inherent performance and scalability limitations.

Alternatively, a media management application with a database can be used to define and store metadata about the content. The external database maintains a reference — often a file path or unique identifier — to the file as it is stored on disc, or data tape. The advantage of this approach is the ability to search quickly through metadata about the content.

Storing metadata in an external database enables scalability, but because metadata doesn't explicitly travel with the content to external systems, cross-system integration can become more complex. Keep these factors in mind as you design your metadata model.

Your workflow can be enhanced enormously through the effective use of metadata, which increases the visibility of the content within your system, provides life cycle status information, and enables automatic routing and content processing based on business rules. That said, your workflow efficiency can only be as good as the metadata you collect and your diligence in ensuring consistency as your system grows. BE

By Simon Eldridge is senior product manager for Omneon, now part of Harmonic.

2011

NAB PREVIEW

Here's looking at you!

Each year, the *Broadcast Engineering* staff provides a guide full of comprehensive coverage to help you make the most of your time at the NAB Show. This manual is meant to serve as your ultimate resource for hitting the NAB jackpot! First, we announce the winners of our Excellence Awards competition. We'll recognize these facilities at the NAB Show for their achievement in each of eight categories. Next, our exhibit hall map will help you find your way through the maze of booths. And finally, browse through more than 25 pages of product descriptions and photos to build your ultimate shopping list. Whatever you're looking for at this year's show, we wish you the best of luck in finding it!

The BroadcastEngineering 10th annual Excellence Awards

Note from the editor

This year, there were 48 entries in *Broadcast Engineering's* Excellence Awards contest.

The winning entries were selected based on votes we received from our readers on our web site.

Congratulations to all the entrants in this year's contest. You represent the highest quality in television, production and network technology. To see firsthand the equipment and solutions used by these leading facilities, visit the NAB booths of the vendors described in the stories. For directions to each vendor's booth, check out our extensive NAB map, which begins on page 59.

Brad Dick

Brad Dick
Editorial Director

New studio or RF technology – station

WINNER: PBS 46

Submitted by Volicon

Runner-up: LDS Conference Center
Submitted by Harmonic

New studio technology – network

WINNER: ESPN transmission facility 46

Submitted by ESPN

Runner-up: METROETHERNET
Submitted by Globo Comunicaçao e Participações

New studio technology – HD

WINNER: ABC's central switching center 48

Submitted by Disney/ABC

Runner-up: NBC
Submitted by Utah Scientific

New studio technology – nonbroadcast

WINNER: FedExField 48

Submitted by Communications Engineering, Inc.

Runner-up: Georgia Dome
Submitted by Comprehensive Technical Group

Station automation

WINNER: Comcast Media Center..... 50

Submitted by Comcast Media Center

Runner-up: Encompass Digital Media
Submitted by Encompass Digital Media

Network automation

WINNER: Starz Entertainment 50

Submitted by OmniBus Systems

Runner-up: SWRV
Submitted by never.no

Newsroom technology

WINNER: CNN 52

Submitted by Omneon

Runner-up: Sky News
Submitted by BSkyB Technology

Post & network production facilities

WINNER: MSG Media 52

Submitted by The Systems Group

Runner-up: Trinity Music City
Submitted by TV Magic

Better audio mixing. From every point of view.

Drawing on more than 60 years of experience in the design of rock-solid, industry-proven broadcast equipment, the Studer Vista 9 is the digital mixing console that makes sense from every point of view – creative, commercial and practical.

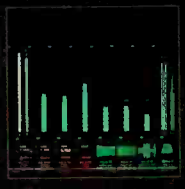
Building on the acclaimed and proven Vista digital mixing platform, the Vista 9 combines advanced ergonomic design with complete system flexibility, pristine audio quality and groundbreaking new features to create a console fit for a new age of broadcast and live production.

Find out more at www.studer.ch

See us at NAB
Booth # C2619
NABSHOW
Where Content Comes to Life

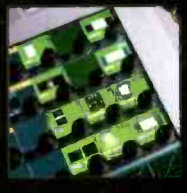
Vistonics™
Free your mind to mix

FaderGlow™
Lighting the way to intuitive mixing



Comprehensive metering includes reviewable recent history

Complete system flexibility lets you mix the way you want to mix



Vista 9 makes surround sound easy

Dual control systems and power supplies ensure perfect peace of mind

VISTA 9™
DIGITAL MIXING SYSTEM

STUDER
by HARMAN

www.studer.ch

PBS

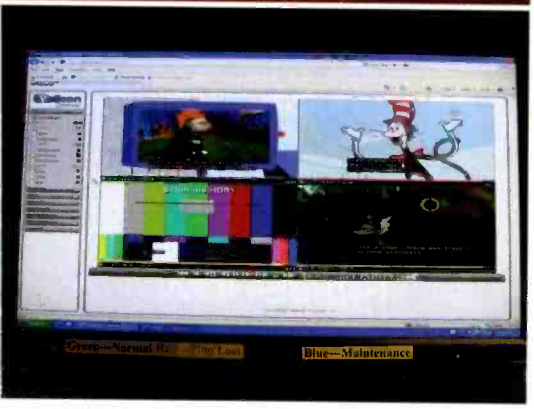
Winner of new studio or RF technology – station

Submitted by

Volicon

Runners-up:

LDS Conference Center
Submitted by Harmonic



The PBS Technology Center in Alexandria, VA, is responsible for continuous delivery of transmissions — four HD channels and eight SD channels — to member stations across the continental United States, Hawaii, Alaska, Guam and Samoa. Each month, PBS, with its nearly 360 member stations, reaches more than 120 million people through television and nearly 21 million people online. By 2010, the logging system that monitored satellite transmissions had begun to show its age. To refresh its video monitoring and logging capabilities, PBS sought a more advanced solution capable of monitoring multiple channels, merging as-runs from automation with aired video, providing fast response times, enabling effective searches across aired content and supporting easy clip exports. The Observer Enterprise, an automated and fully redundant digital video monitoring and logging system, met these demands and offered additional functionality that streamlines PBS monitoring processes.

A main priority for PBS was to have the tools necessary to get to video immediately, and the Volicon Observer allows engineers to watch live video or recorded material within just two seconds. In addition to enabling fast visual confirmation, the Observer system allows staff to search back on a playlist for a particular program or for words that would have been present in closed captioning at the time. Staff thus can monitor any signal impairments and diagnose those issues quickly.

Soon, the Observer will provide a fast and easy way of confirming that AFD codes have been sent correctly and that stations have received the data they need to display a given piece of video properly. If any metadata is determined to be incorrect, engineers in Alexandria will be able use the logging system to look back, see what metadata was transmitted and begin troubleshooting. ■

ESPN transmission facility

Winner of new studio technology – network

Submitted by

ESPN

Runner-up:

METROETHERNET
Submitted by Globo Comunicação e Participações

ESPN's continued rapid growth was the catalyst for a new transmission facility, which opened on July 15, 2010, and was designed with a 10-year vision of growth. It consists of a 5400sq-ft control room, two equipment rooms and a network operations center to support ESPN's private fiber network.

The heart of the facility is a new automation system, the intelligent resource manager that was developed in collaboration with Evertz Microsystems. This system uses a variety of discrete control systems. The intelligent resource manager provides a common user interface to optimize the use of resources through a real-time data exchange with ESPN's internal event scheduling application. Resources for an event are reserved, configured and routed with just a few mouse clicks, which has yielded significant improvements in workflow efficiency.

Net Insight's Nimbra Vision platform provides service provisioning, bandwidth monitoring and alarm notifications for network events across all nodes in the system, which allows full view and enables fast response times to any network event on a 24/7 basis.

The facility is 3G-compliant with two 1152-squared Evertz EQX 3G routing systems, two 576-squared ASI routing systems, two 256 x 128 L-band routing systems and dual MADI routers. Streamlined management systems and consolidation of core routing systems reduce the complexity of the day-to-day operational workflow.

Best-practice optical and electrical cable management systems have greatly enhanced the integrity of infrastructure installation and maintenance, eliminating clutter encountered in a shared space. The use of embedded audio has expanded audio channel-handling capability from eight to up to 16 channels, and the Consumer Experience Lab allows for real-time evaluation of ESPN's end product, including 3-D and 5.1 discrete surround sound. ■

On Air!

Broadcast solutions for reliable network coverage.

Our solutions provide you with a consistently strong signal – everywhere.

When it comes to transmitter performance, we have provided strong, full coverage signals to customers worldwide for more than 75 years.

Always a step ahead with solutions from Rohde & Schwarz.

www.rohde-schwarz.com/ad/onair-useu/be

ROHDE&SCHWARZ

ABC's central switching center

Winner of new studio technology – HD

Submitted by
Disney/ABC

Runner-up:
NBC
Submitted by Utah Scientific


Photo courtesy Andy Washnis

ABC's new HD central switching center (CSC) is designed to simplify and improve routing, signal distribution and transmission operations, while remaining format-agnostic (SD, HD, 1080p/60 and possibly full-res 3-D).

The heart of the entire plant is an Evertz 1152 x 1152, format-agnostic, core router with fiber I/O that replaces the existing SD plant router and also serves as a tie-line router to connect the satellite routers together in a hub-and-spoke topology. The tie-line quantities were sized to avoid a "tie-line busy." This topology, together with advanced router control, creates a router "cloud," making every source available to any destination regardless of what router they are connected to. To support a mix of SD and HD sources throughout the plant, the control system is designed to be aware of source signal formats, routing signals through Harris up/downconversion as required to deliver the appropriate signal to the requesting destination.

Audio is embedded in the new facility, router tie lines and patchable trunks. Signal conversion occurs at the edges of the fiber plant using Ross Video mux/demux cards with fiber I/O. Trunks with a mix of Evertz and Ross conversion gear at each end were designed to permit conventional patching for additional signal distribution throughout the plant.

The new transmission workstations include integrated monitoring, routing and processing control. An Evertz 512 x 512 plant input router with audio breakaway feeds 110 Miranda signal processors (frame sync, signal processing, up/down/crossconvert, up/down audio mix and ARC) for inbound signal routing to the core router. Monitoring is driven by Miranda KX monitor wall processors fed by an Evertz 576 x 576 monitor wall router. Input and monitor routing as well as processing control are accomplished by Miranda RCP-200 control panels under iControl.

FedExField

Winner of new studio technology – nonbroadcast

Submitted by
Communications Engineering, Inc.

Runner-up:
Georgia Dome
Submitted by Comprehensive Technical Group

When the Washington Redskins kicked off the 2010 regular season against the Dallas Cowboys, its fans were treated to a completely new stadium experience thanks to a comprehensive HD upgrade to the FedExField video control room and infrastructure by Communications Engineering, Inc. (CEI). The new system enables the event-day control room to originate HD programming and to transmit the signals to the new FedExField HD LED video displays and stadium-wide video distribution systems, and places the facility at the leading edge of NFL stadium technology.

The system features the ability to receive and record video and audio feeds from network TV production trucks, as well as video signals from the dedicated video replay system, cameras, and other external audio and video sources. CEI was responsible for project management, space planning, final design, equipment procurement, systems integration, interfacing with the new 100ft-wide Daktronics video boards and data processors, installation, testing, and training for the HD upgrade.

One of the main goals was to improve the workflow in the room, and this was accomplished with more efficient digital equipment, improved consoles and a more effective layout. The existing control room was completely gutted to accomplish that goal. A key challenge was the deadline, because the facility had to be ready in time for the start of the football season. Also, CEI's staff had to work in conjunction with contractor personnel because the space was being completely renovated at the same time.

The upgrade also included a file-based workflow system that allows easy audio and video clip storage and playback. Plus, the new control room features a multiviewer at every operator position, allowing many sources to be easily viewed and managed from anywhere in the room. The end result is a much more efficient system and a greatly enhanced experience for the fans.

First!

Measurable edge in analyzing broadcast signals.

No matter what standards or transmission methods you work with, we have the complete range of equipment to support you.

Always a step ahead with solutions from Rohde & Schwarz.

www.rohde-schwarz.com/ad/first-useu/be

ROHDE&SCHWARZ

Comcast Media Center

Winner of station automation

Submitted by

Comcast Media Center

Runner-up:

Encompass Digital Media
Submitted by Encompass Digital Media

With the launch of its latest control room, Comcast Media Center (CMC) developed a new solution for multichannel program origination that improves program uptime while simultaneously reducing operator workload.

With the advance playback model, CMC staff runs the scheduled programming hours in advance of the true air time, caching the programming into delay servers, which replay the content at its scheduled time. This approach allows the operators to monitor a preview of the program signal and, should there be a deviation from scheduled programming or a system failure resulting in program interruption, the operator can mark the time of the discrepancy, recover the service and cover the discrepancy from a parallel real-time program path at the true air time.

Through a synchronizing feature, the Titan system allows the operator to edit the advance playlist and have changes automatically update the real-time playlist, saving edit time. The advance playback control room also employs a live event management pod, which contains a dedicated live event operator that can manage dynamic live events autonomous of the main master control operator.

The Heads Up Display (HUD) was added to ensure master control operators focus on the quality of the programming and performance of the technical systems, and reduce reliance on the traditional automation display to exception handling. A custom software application developed in-house, the HUD system reads the Titan schedule data in real time and presents on-air events, plus a "look ahead" for other primary events and secondary events, to the operator in a rundown. The system presents only the most critical elements of the automation playlist, essentially decluttering the schedule information compared with the traditional automation display. ■

Starz Entertainment

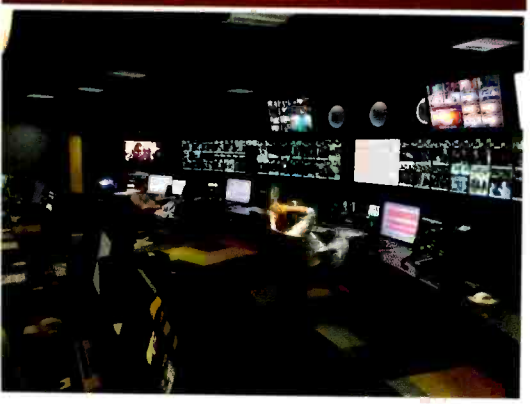
Winner of network automation

Submitted by

OmniBus Systems

Runner-up:

SWRV
Submitted by never.no



At the beginning of 2008, Starz Entertainment processed around 26,000 assets, rising to more than 80,000 in 2009, with a projection of 200,000 in 2010. Faced with this intensive expansion, Starz needed not only to upgrade its existing equipment infrastructure, but also to find a way of doing so that would create a sound platform for further growth.

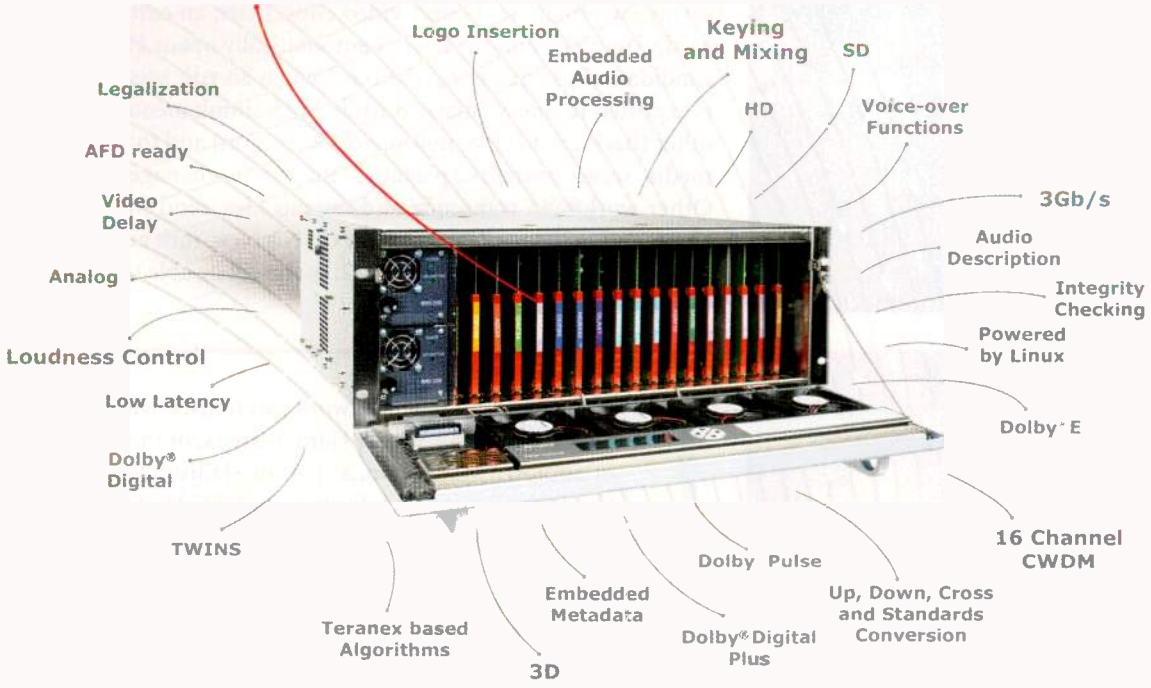
As a longtime user of OmniBus Systems' Colossus, Starz had been an early adopter of the automation manufacturer's software-based iTX system. In 2009, the broadcaster decided to migrate its entire operation to the iTX platform. With iTX, Starz has been able to reduce its infrastructure from 44 racks to just 16, freeing up a considerable amount of space for growth without needing to extend the existing equipment room. The iTX platform, running on commodity IT servers and storage, also meets a key requirement of the design brief for the new infrastructure: By combining all the functions required for the sophisticated branded channels Starz broadcasts, iTX reduces the complexity of maintenance and potential for equipment failure, eliminating most of the recurring capital and maintenance costs.

To meet Starz's requirements for originating fully-crafted channels, the design team pressed OmniBus to accelerate development of some features already on the iTX roadmap. These features included extended graphic and effects capabilities to support Starz's style of branding, in-built Dolby digital surround-sound processing and Nielsen ratings code generation. OmniBus developers also extended iTX's closed-caption functionality to support both 608 and 708 formats. With iTX including the capability to meet all these requirements in software, Starz was able to further reduce its requirement for external equipment. Using the iTX developer kit and working with OmniBus, Starz's technical staff integrated iTX with the in-house developed asset management, content preparation and distribution systems to achieve a tight fit for efficient workflow. ■

See us at NAB2011 | Booth #N3024

How great would it be... to have all seeing eyes?

Modular Multiview



This might sound like the stuff of legend, but with a little Dutch wizardry your dreams can come true. New from Axon is the world's fastest multiviewer – just one field delay – called SynView.

With 3Gb/s and HD capabilities SynView is for today's and tomorrow's broadcast production challenge. This low latency and ultra compact modular multiviewer lends itself to the broadest range of mission critical applications from OB and studio production video walls to multi-screen high resolution and master control systems.

SynView from Axon – when performance and reliability matter.

www.axon.tv

glue and beyond

AXON®

CNN

Winner of newsroom technology

Submitted by

Omneon

Runner-up:

Sky News
Submitted by BSkyB Technology

At its Atlanta headquarters, CNN undertook the replacement of its aging SD feed-ingest, edit and playout infrastructure with new HD equipment. This was accomplished through collaboration between CNN's Broadcast Engineering & System Technology (BEST) and the Omneon (now part of Harmonic) Broadcast Solutions Group. The Omneon Media Application Server (MAS) was the lynchpin of the project.

The typical workflow starts with Viz Dart, which operators use to schedule a feed ingest or trigger a crash recording. Even before the recording begins in an Omneon MediaDeck, metadata is exchanged to make an association between the file in the MAS and CNN's MediaSource-2. As the HD XDCAM-35 file begins recording on the MediaDeck, the MAS manages file transfers to IPV (to make proxies) and two 126TB Omneon MediaGrid active storage systems. Within 10 seconds of the beginning of ingest, the growing file becomes available on each MediaGrid and can be opened in Final Cut Pro using Sony's Cinemon plug-in. Files are edited on the server.

More typically, writers and producers use MediaSource-2 to create projects, view proxies and select video clips. Later, an editor selects the project in MediaSource-2, and the project automatically opens Final Cut Pro with all the candidate clips already "in the bin." When an edit session is complete, the file is exported to one MediaGrid while MAS simultaneously copies the file to the other (backup), to IPV (new proxy generation) and to two Omneon Spectrum media server systems (playout). Playout is managed by Avid ControlAir. Other workflows transcode and rewrap files, send material to and from archive, and exchange material with CNN's New York and Washington bureaus. Through MAS and MediaSource-2, users will be able to view contents from all locations from a single interface.

MSG Media

Winner of post & network production facilities

Submitted by

The Systems Group

Runner-up:

Trinity Music City
Submitted by TV Magic


Photo courtesy Andy Washnik

For decades, the MSG Network was housed within the famous Madison Square Garden arena, in the heart of midtown Manhattan. As part of Madison Square Garden's ongoing transformation, MSG Media had the unique opportunity to build a first-class, state-of-the-art television facility. It turned to The Systems Group (TSG) to plan, design and implement the network transformation with an additional focus on completely integrated and enhanced production and post-production workflows.

Harris provided the majority of core infrastructure technology. MSG Media had previously replaced its SD server operations facility with Harris' high-definition NEXIO server and nonlinear editing system and used Harris to provide the glue for MSG Media's first local HD production control room. It was a natural progression to use Harris technology to light the large capacity dark fiber run to interconnect the Garden and 11 Penn facilities, as well as to interconnect the production, post-production, studios and rooftop camera systems located in 11 Penn.

The project also provided the ideal opportunity to enhance the NEXIO server system with 64-bit technology, as well as to provide multiple playout and ingest control points and improve production and transmission server workflows. Harris also sourced a new digital signage platform for use at the Garden and 11 Penn Plaza and partnered with Dixon to create new digital logging capabilities to further reduce reliance on tape-based content.

TSG fostered collaboration between Harris and Metamedia that resulted in the integration of a Final Cut server system with XSAN and Mac Pro graphic content creation systems. The integration of Apple and Harris products has significantly improved the ability to share content between graphics content creation and production/post production while all but eliminating sneaker net, greatly reducing videotape dependence and increasing content production.

With the world's largest FSS fleet and the most extensive global teleport and fiber infrastructure, Intelsat provides its customers with unparalleled resources.

Put the power and reach of the Intelsat network to work for you. To learn more, visit www.intelsat.com.

For more information:
sales.eme@intelsat.com
+44 20-3036-6700

INTELSAT.
Closer, by far

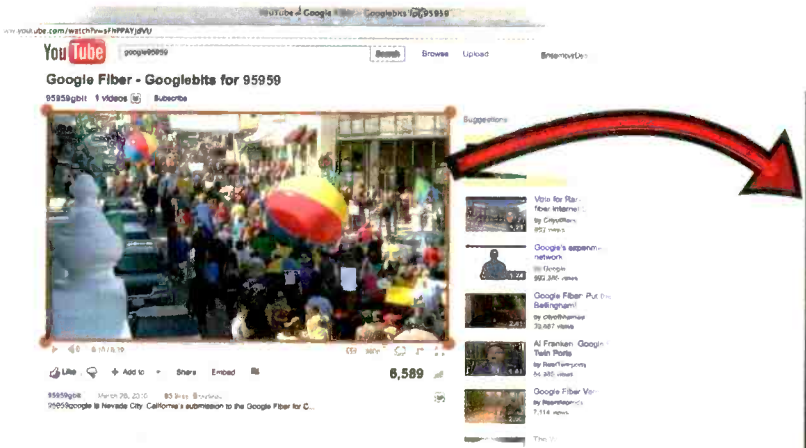
www.intelsat.com

2011 DTV MARKETPLACE

Here's looking at you!

Does your scan converter do this?

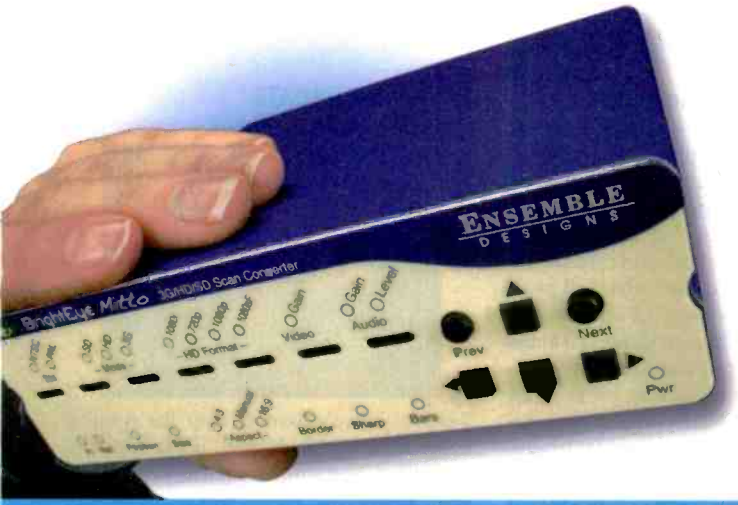
Upconvert YouTube and Skype to full screen HD.



Computer desktop

YouTube video upconverted to full screen HD SDI video

BrightEye Mitto™ Scan Converter is the new way to take YouTube™, Skype™ video, weather radar, maps and viewer emails to your SD, HD or 3 Gb/s master control or routing switcher. Even a small part of the computer screen is upconverted to full screen HD video.



- High Performance Scan Converter
- Proprietary scaling and new filtering system outputs maximum detail, flicker-free video
- Genlock reference input, timeable output
- Easy-to-use Mac and PC interfaces, too
- New iPhone™ and iPad™ support

Tel +1 530 478 1830
www.ensembledesigns.com
NAB N1323

ENSEMBLE
DESIGNS

Purveyors of Fine Video Gear - Loved By Engineers Worldwide

Color indicates advertisers

Audio accessories

TRANSMISSION AUDIO/LOUDNESS MANAGER
Linear Acoustic AERO.air

Now available in a 2RU version; HD/SD-SDI I/O allows for de-embedding and re-embedding up to 16 channels of audio plus SMPTE 2020 (VANC) metadata; UPMAX-II provides a more spacious and stable 5.1 upmix from stereo source; CrowdControl ensures dialogue is preserved even in rich stereo mixes.

717-735-3611; www.linearacoustic.com
Booth: SU3326

MIXER
Solid State Logic C10 HD

Provides a self-contained console with no additional processing racks and passive cooling for smaller spaces; broadcast production automation option provides support for Ross and Sony production automation systems; a 5.1 upmix option generates multichannel surround output from stereo sources; dialog automix option ensures reliable multimic talk show audio level management.

212-315-1111; www.solidstatelogic.com
Booth: C3310

AUDIO MONITOR
Wohler MADI-8

Enables broadcasters to implement the Multiple Audio Digital Interface (MADI or AES10) in their production workflows; can be connected in series within a 64-channel MADI stream to audibly monitor up to eight channels; the 1RU monitor features a 16-character by two-line LCD display, as well as both coax and optical MADI inputs and outputs, mixed two-channel or mono analog outputs, channel presence indicators, and eight user-nameable presets.

510-870-0810; www.wohler.com
Booth: N2524

TRIAMPLIFIED DSP MONITORING SYSTEM
Genelec 8260A

Three-way DSP system is designed to provide more accurate imaging and improved sound quality on the acoustical axis and off-axis; combines a coaxial driver with modern waveguide technology, ensuring drivers to couple coherently over their full operating bandwidth and creating coincident midfrequency/high-frequency point source; offers signal processing responsible for all loudspeaker functions, including crossover filters, driver equalizers, driver position alignment, room response alignment, calibration and equalization-related features.

508-652-0900; www.genelecusa.com
Booth: C1332

Audio mixers, on-air, portable, studio, playback

LOUDNESS CONTROL MODULE
Axon Digital Design Synapse DLA42

Module based on third-generation audio and loudness management technology by Linear Acoustic; accepts four pairs of PCM audio to handle four stereo programs; features input gain, phase and delay adjustments, parametric EQ for the 5.1 input and 2.0 sources, 2.0 loudness control of four stereo discrete channels, and metadata manipulation of external source to preset levels (DialNorm).

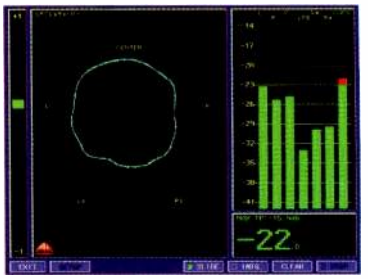
212-683-6724; www.axon.tv
Booth: N3024

TV AUDIO CONSOLE
Wheatstone Dimension One

Features Wheatstone's Network First design, which puts a digital audio network, not a console, at the center of all functions; instead of connecting audio sources to one or more consoles, they are connected directly to the digital network; unlike the traditional console design where all functions are located within the console system itself, this new design locates all audio functions in an equipment rack independent of the console, leaving an intuitive control surface in the control room; features 72 faders, up to 3072 inputs, 16 submasters, 16 mix minuses, eight aux sends, four digital control masters and two 5.1 surround mixing busses; because each fader has its own independent bus-minux output, the total of available mix minus feeds is more than 100.

252-638-7000; www.wheatstone.com
Booth: C2623

SOFTWARE UPDATE
DK-Technologies MSD, PT0 600 Series



Free update enables monitors to use the new ATSC and European EBU R128 and ITU BS1770/1771 loudness recommendations; all new MSD and PT0 600 series meters will automatically have these specifications included.

800-421-0888
www.dk-technologies.com
Booth: C7840

AUDIO PROCESSOR
Junger Audio T*AP Television Audio Processor

Wideband eight-channel processor (8x1, 4x2 or 6+2) focuses on automatic and adaptive loudness control; handles digital inputs (AES) and, through interface slots, all other usual audio formats, including all SDI versions (SD, HD, 3G); offers dynamic equalization so that the sound can be "colored."

+49 30 677 7210; www.junger-audio.com
Booth: C6742

SOFTWARE UPDATE
Lawo V4.12 software

Support Lawo's Remote App for Apple's iPhone, iPod touch and iPad; features AMBIT, a new upmix algorithm that offers automatic high-quality stereo-to-5.1 conversion; adds support for a new 3G-SDI card and a new GUI page for control of the mxDSP card 64x64 summing matrix.

+49 7222 1002 0; www.lawo.de
Booth: C2628

SR1 Audio Analyzer

- *–112 dB THD + N*
- *± 0.008 dB flatness*
- *200 kHz system bandwidth*
- *24-bit / 192 kHz digital audio*
- *True dual-channel FFTs*
- *Digital audio carrier testing and jitter analysis*

SR1 ... $8400 *(U.S. list)*

SR1's outstanding specifications and rich suite of measurements make it ideal for analog, digital, and cross-domain audio testing.

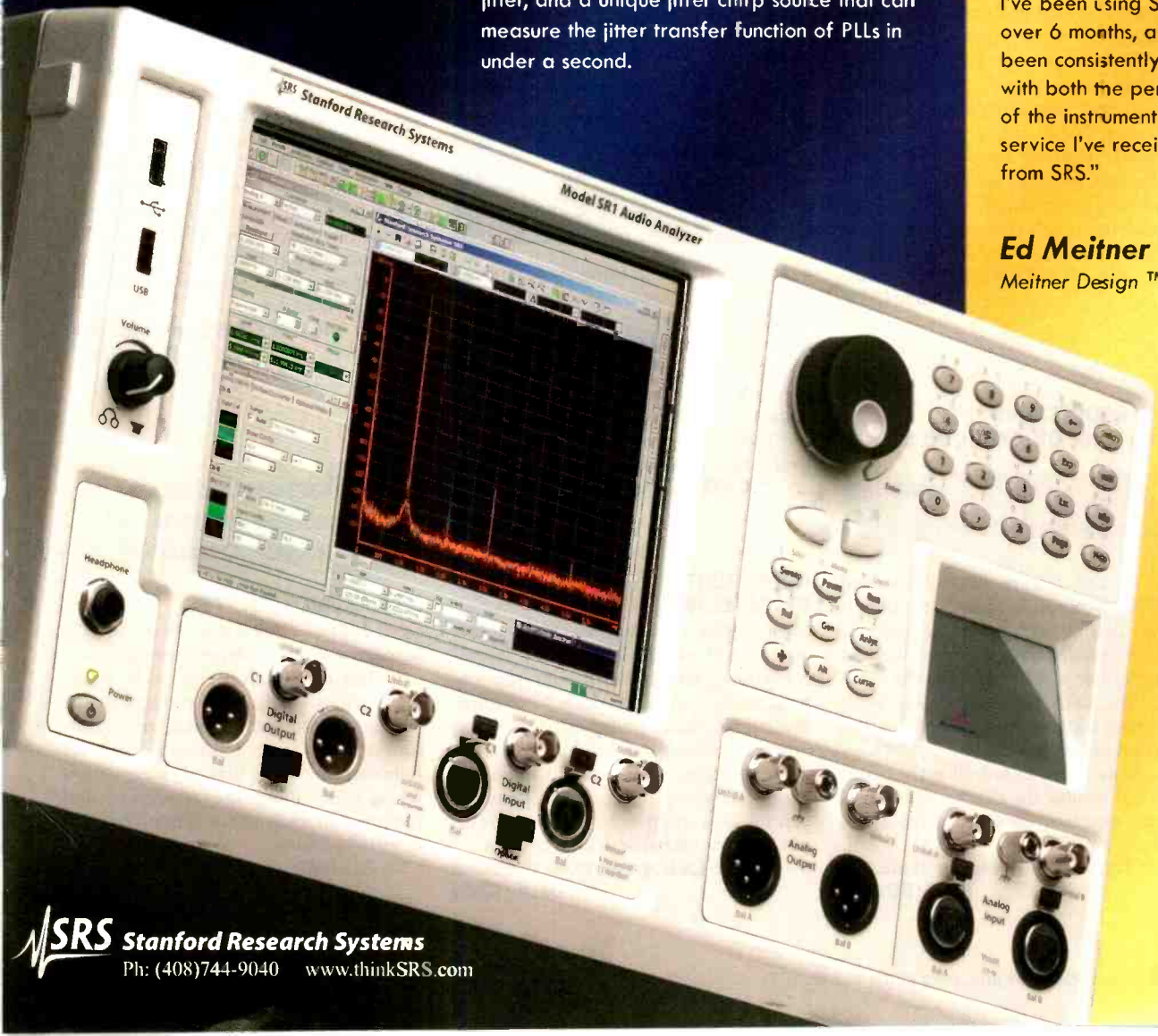
Standard features include all the measurements you would expect: Level, THD + N, Harmonic Distortion, IMD, FFT, Frequency Response, Multi-Tone, Crosstalk, Histogram, Jitter Amplitude & Spectrum, and more. But *SR1* also gives you advanced features like log-sine chirps for clean impulse response measurements, input histogram and PDF measurements, and true two-channel FFTs for real time group delay measurements.

Also included are a full set of digital audio carrier measurements including a low-noise jitter detector with less than 600 ps residual jitter, and a unique jitter chirp source that can measure the jitter transfer function of PLLs in under a second.

"SR1's combination of features and performance make it the best value in analog and digital audio testing available today.

I've been using SR1 for over 6 months, and I've been consistently impressed with both the performance of the instrument and the service I've received from SRS."

Ed Meitner
Meitner Design ™



thinkSRS.com

SRS **Stanford Research Systems**
Ph: (408)744-9040 www.thinkSRS.com

Color indicates advertisers

AUDIO MIXER
Studer Vista 5

32-fader unit consists of 20 channel strips and 12 additional versatile strips for operating output and input channels.; up to 240 channels can be accessed from the desk, and the total I/O capacity may exceed 1700 inputs and outputs, depending on the additional cards and configurations.

818-895-3496; usa.studer.ch
Booth: C2619

AUDIO ANALYZER
Stanford Research Systems SR1

Performs standard analog measurements as well as true dual-channel FFTs for impulse response measurements using any source material; makes complete digital audio carrier measurements, including jitter analysis; recent updates include improved usability (prestored configurations and learning mode), new measurements (group delay, crest factor and impulse response) and new waveforms (MLS, log-swept sine and Jitter Chirp).

408-744-9040; www.thinksrs.com
Booth: C1155

AUDIO PROCESSORS
TC Electronic DB-4 MKII, DB-8 MKII

New versions feature EBU R128- and ATSC A/85-compliant new LM6 loudness meters, new SNMP functions and one week of detailed logging, even without connection to a computer; for the DB-4 MKII, the LM6 meter is always available in addition to its two multichannel audio processors; offers two power supplies, double the fuses, double the mains inlets and double the fans for redundancy; run presets from original DB-4 and DB-8 units

+45 8742 7000; www.tcelectronic.com
Booth: SU10217

Audio routing, distribution

FIBER-OPTIC SIGNAL TRANSPORT
Riedel Communications MediorNet

Fiber-based real-time signal transport solutions for uncompressed multichannel HD/SD video, audio, intercom and data; now available in new MADI and RockNet MediorNet cards as well as the software-based Framestore feature for U.S. markets; combines signal transport, routing and signal processing and conversion into one integrated real-time network; includes signal routing, allowing users to send any incoming signal to any output or even to multiple outputs by just a mouse click or by a router control system.

914-819-0495; www.riedel.net
Booth: C6737

AUDIO SWITCHER
Sierra Video MADI-xx

128 x 128 MADI routing switcher with integral multichannel audio metering and signal fault alarms for up to 128 channels; allows users to monitor and interact with each audio signal within two 64-channel MADI feeds; designed for live sound, theaters, radio and TV, where MADI signals are increasingly employed, and mobile production applications.

530-478-1000; www.sierravideo.com
Booth: SL6005

AUDIO ROUTER
STAGETEC NEXUS

Functions as an audio network, a router and an I/O matrix; offers audio format conversion, A/D and D/A converter systems, audio processing, data forwarding, routing interfaces, multichannel metering, power amplifier control and intercom; optical interconnections carry all audio and control data in a digital format; graphical control software application allows any input to be routed to the desired outputs.

888-782-4391; www.usa.stagetec.com
Booth: C2452

MANAGEMENT SYSTEM
Calrec Audio Hydra2 Operator (H2O)

Allows users to control the Hydra2 network router independently from any console control surface; users can set up routers and configure access rights to all desks on a given network, as well as enter network-wide I/O boxes and port labels for ease of identification; offers the ability to arrange ports into folders, making them quicker and easier to locate.

+44 1422 842159; www.calrec.com
Booth: C1746

AUDIO MONITOR
TSL PAM2i-C

Uses the features of TSL's PAM2-3G16 and adds external screen monitoring capability, IT network integration and advanced signal management functionality such as loudness logging, audio alarm reporting and third-party system control; forms part of an integrated facilitywide audio monitoring and management system collecting and collating signal data from ingest, master control, QC and any other critical element of the broadcast workflow.

+44 1628 676 200; www.tsl.co.uk
Booth: N1119

Automation, including news and master control

MANAGEMENT SYSTEM
Obor Digital Zeus Broadcast

Manages the service department; provides help desk communications; tracks all asset activities, changes and configurations; handles multiorganizational, multilocation or multigroup topologies; provides fully searchable and sharable information while maintaining the separation and control that each organization, location or group requires.

407-352-6501; www.zeusbroadcast.com
Booth: N705

NAB SHOW | April 11-14, 2011 | Las Vegas, Nevada

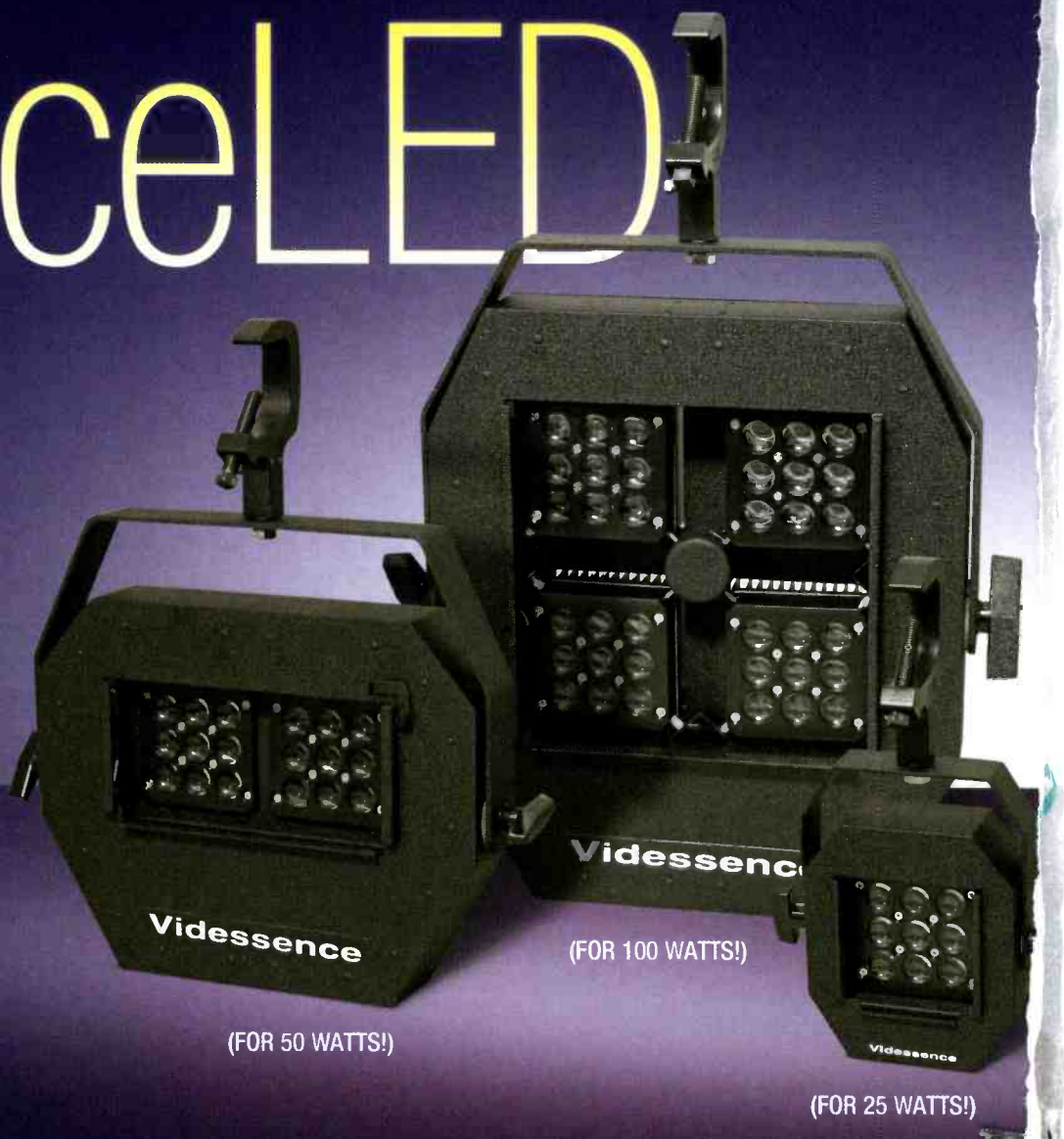
Brought to you by: BroadcastEngineering

ExhibitHall Map

The Most Powerful Light Throw Available

(FOR 100 WATTS!)

ExceLED



(FOR 50 WATTS!)

(FOR 100 WATTS!)

(FOR 25 WATTS!)

Finally, an LED fixture worthy of the Videssence name!
You have to see it to believe it.

Come see its amazing performance at:
NAB 2011 – Las Vegas
April 11-14 – Booth #C2944

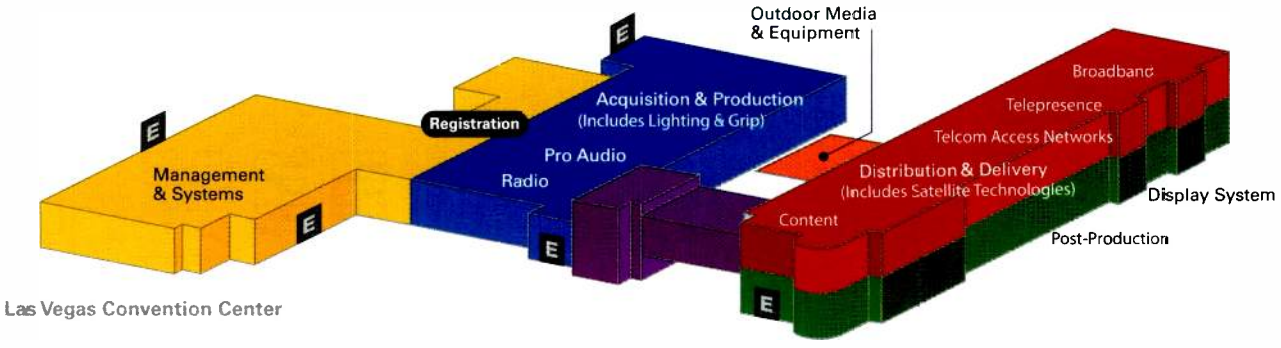
For more information about our other products,
call or visit us online: **(626) 579-0943 | videssence.tv**

Videssence™

Las Vegas Convention Center in Las Vegas, Nevada

EXHIBIT HALL HOURS

Monday, April 11-Wednesday, April 13	9 a.m.-6 p.m.
Thursday, April 14	9 a.m.-2 p.m.



Map information current as of Feb. 19, 2011

MAP INFORMATION

The following is a brief description of what you will find in this year's NAB map from *Broadcast Engineering*.

To the right, you will see a listing of the NAB categories and what products can be found in each. Next to each listing you will find a color square that indicates the convention hall each category is located in. On the overview map (above) you will see each hall with its product categories.

Our table of contents lists each hall and the pages they are found on. On each of these pages you will notice some booths are highlighted with different colors. The ■ highlighted booths are our magazine advertisers, while the □ highlighted booths are our map advertisers.

We thank all of our advertisers for their support of our NAB coverage and exhibit hall map.

TABLE OF CONTENTS

PRODUCT CATEGORIES

■ **Management & Systems** — Video servers, systems integration, database technologies and digital asset management.

■ **Acquisition & Production** — Cameras, lenses, lighting and grip and ingest technologies.

■ **Pro Audio** — Audio recording and mixing equipment, encoding and compression technologies.

■ **Radio** — The entire spectrum of products and services for analog, digital and streaming radio.

■■ **Outdoor/Mobile Media** — ENG vehicles, outdoor signage, satellite services, power products and production equipment.

■ **Distribution & Delivery** — Transmitters and towers for TV, radio broadcasting, satellite technologies, cable, fiber, IPTV, mobile video and streaming products.

■ **Content** — Owners, aggregators and producers showcase their digital content to align with broadcasters, distributors and delivery technologies.

■ **Broadband** — Broadband-enabled TVs, online video, mobile broadband networks, platforms, set-top boxes, gaming, IP, streaming and advertising technologies.

■ **Telepresence** — Copper and fiber technologies for broadcast/telecom broadband solutions, from FTTH, PON and DSL components to IPTV middleware.

■ **Display Systems** — Projection equipment, LCD and plasma displays and digital signage.

■ **Post-Production** — Video editing, graphics, animation, special effects software and hardware, audio editing and music/sound libraries.

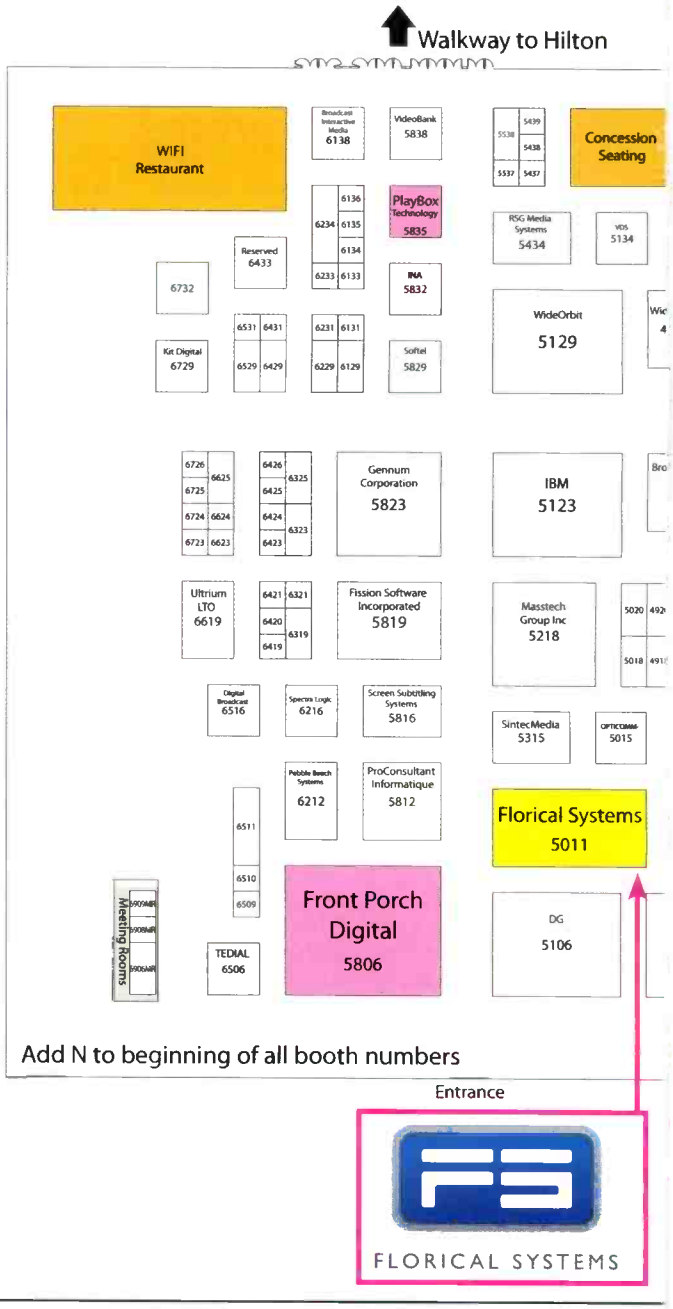
Front cover: See Sencore at booth #SU7213 on page 9

See Videssence at booth #C2944 on page 6

NORTH HALL

Advertisers | Map advertisers | Points of convenience

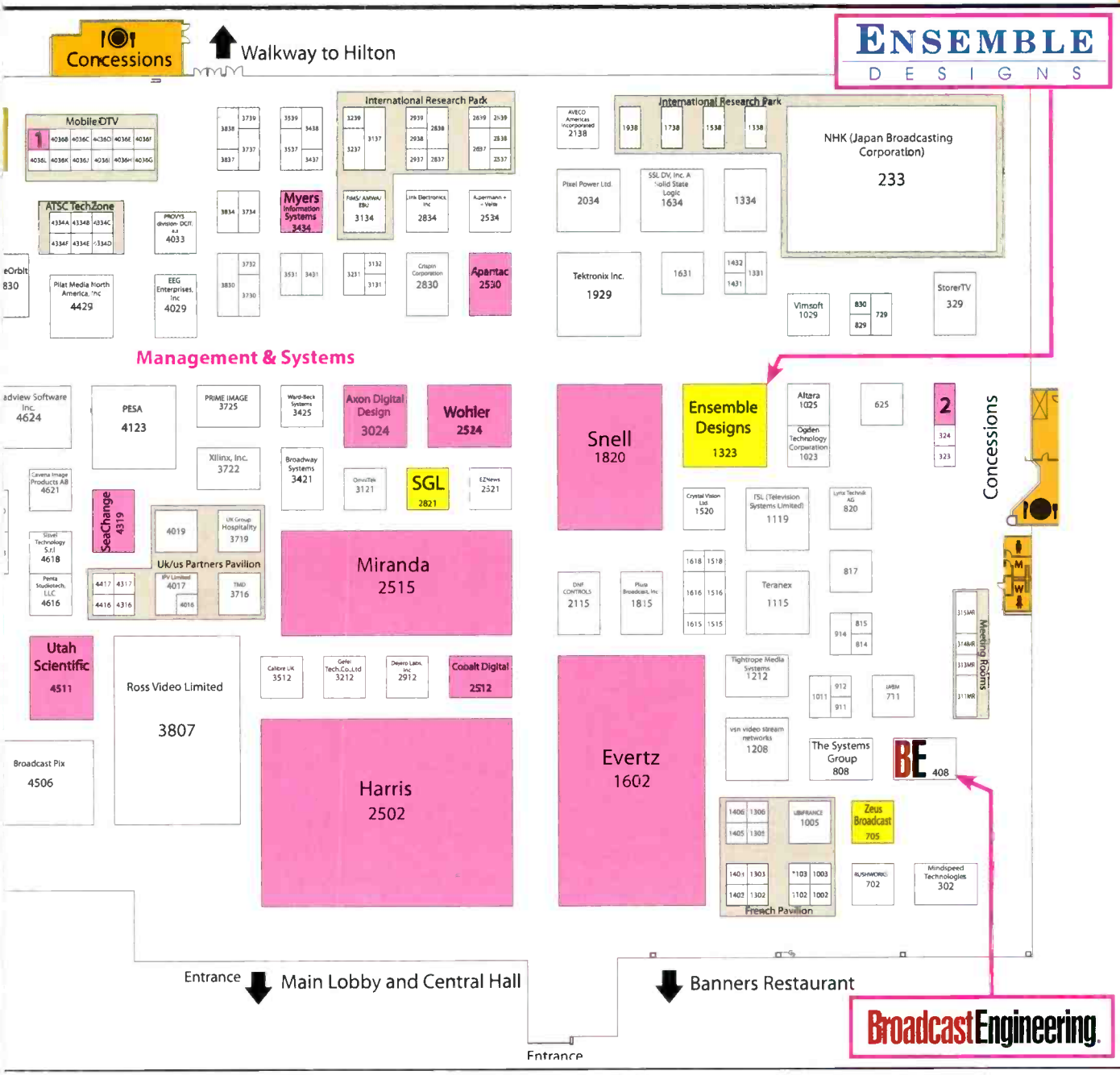
MAP #	COMPANY	BOOTH
1	Triveni Digital	N4036A
2	Phabrix	N325



See Ensemble Designs at booth #N1323 on page 5

See Broadcast Engineering at booth #N408 on page 5

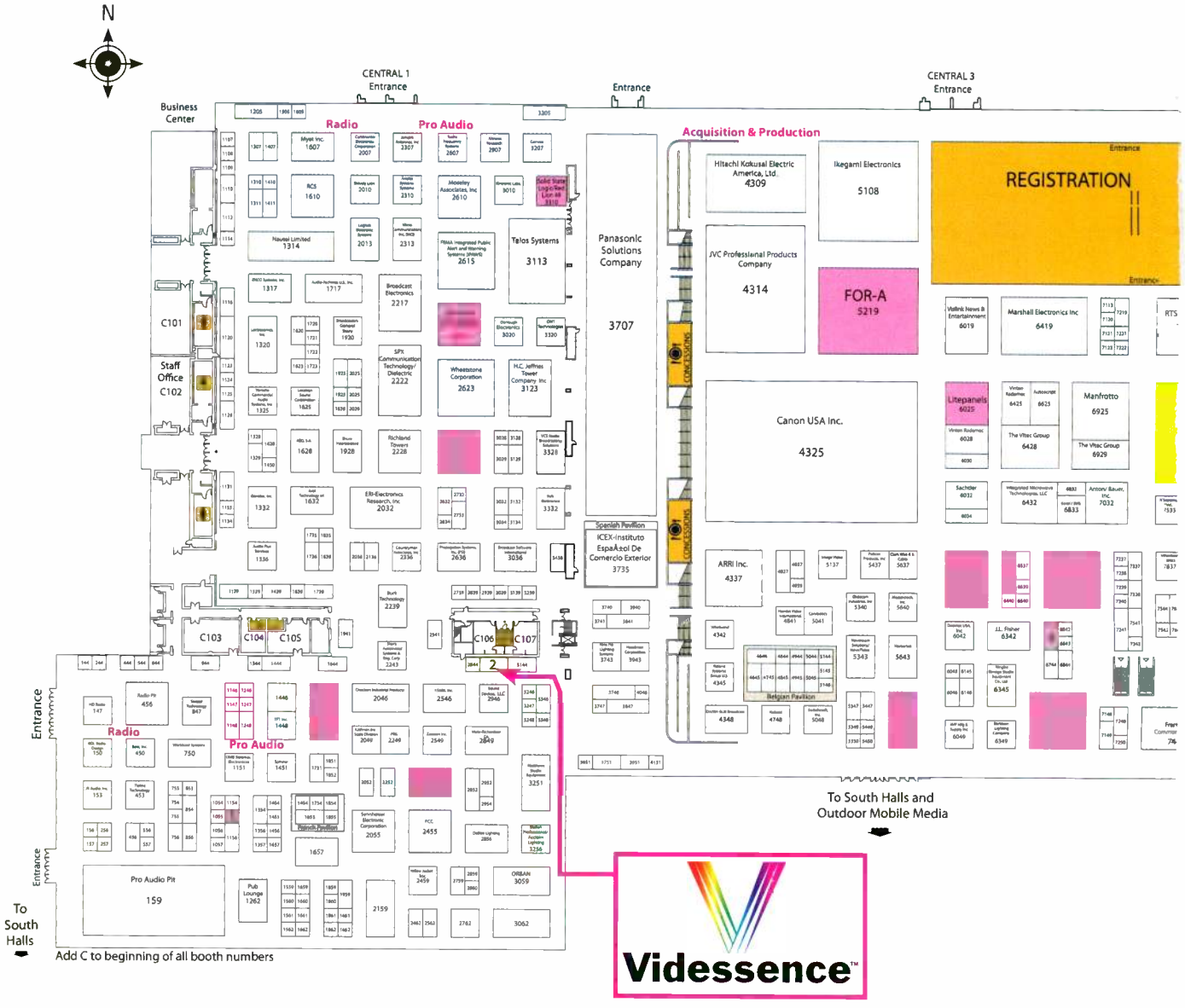
NAB Exhibit Hours, April 11-14, 2011
Mon.-Wed.....9 a.m.-6 p.m.
Thurs.....9 a.m.-2 p.m.



See SGL at booth #N2821 on page 5

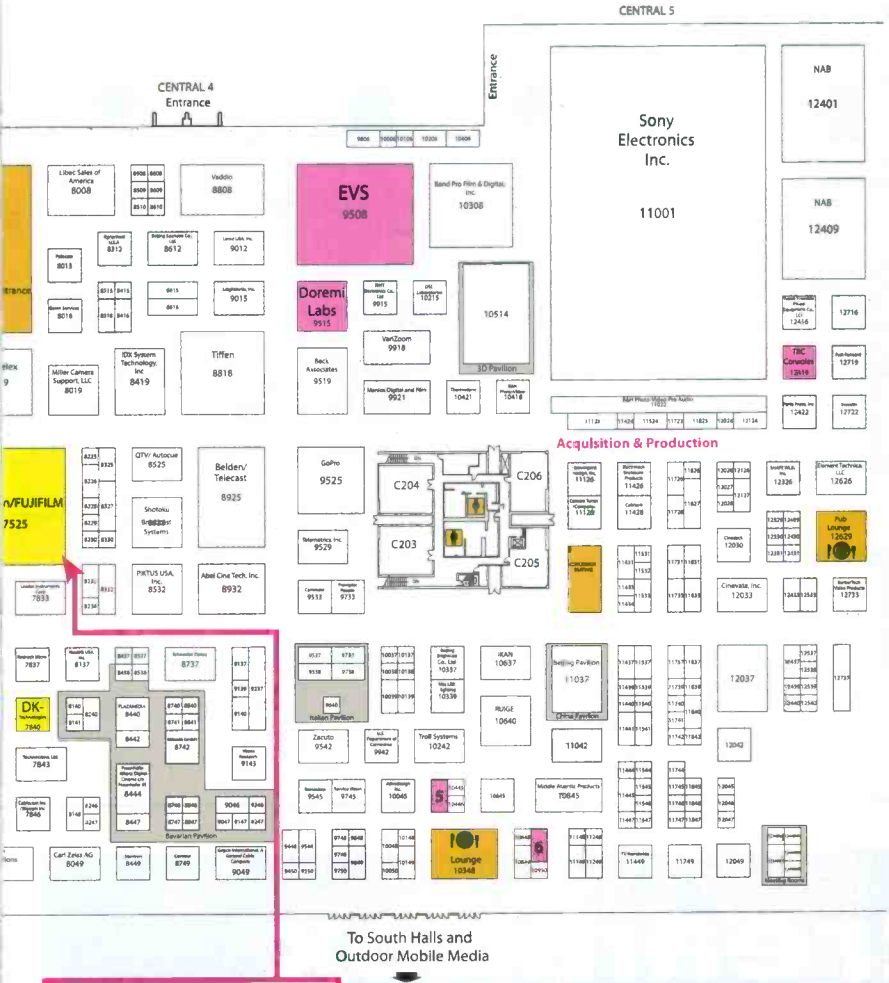
CENTRAL HALL

Advertisers | Map advertisers | Points of convenience



See Broadcast Engineering at booth #N408 on page 5

NAB Exhibit Hours, April 11-14, 2011
Mon.-Wed. .....9 a.m.-6 p.m.
Thurs. .....9 a.m.-2 p.m.

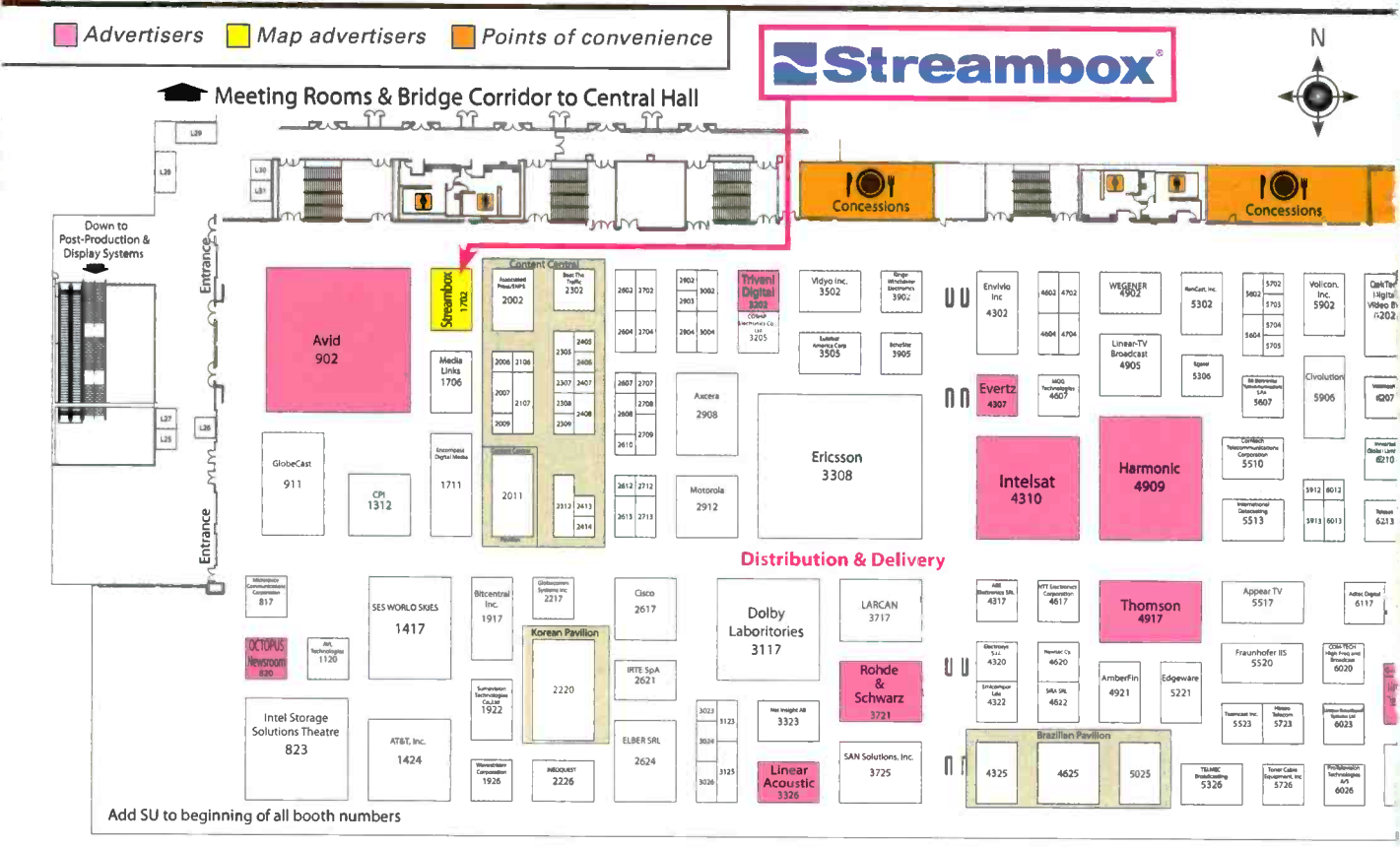


FUJINON

MAP #	COMPANY	BOOTH
1	Stanford Research	C1155
2	Videssence	C2944
3	ESE	C6437
4	Jünger Audio	C6742
5	Optical Cable	C10345
6	Fischer Connectors	C10948

See DK-Technologies at booth #C7840 on page 7

SOUTH HALL, upper level



See Streambox at booth #SU1702 on page 8

DVEO Broadcast Division

sencore

MAP #	COMPANY	BOOTH
1	DVEO	SU6911
2	White Sands Engineering	SU9417

White Sands Engineering, A Division of TVC

Add SU to beginning of all booth numbers

South Hall (upper) continues on page 10

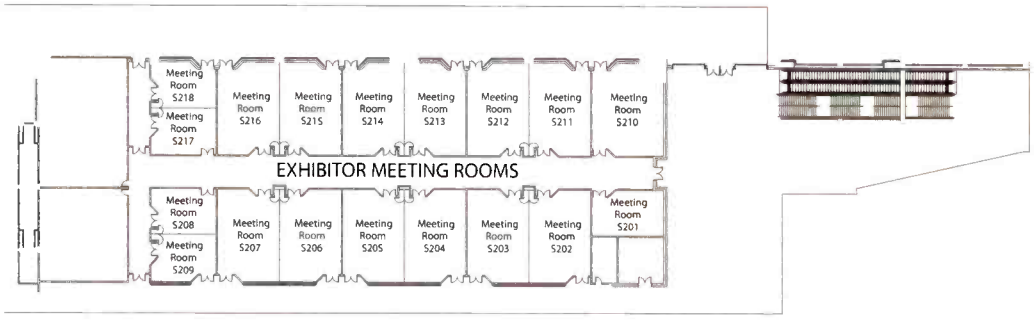
See Sencore at booth #SU7213 on page 9

SOUTH HALL, upper level

Advertisers | Map advertisers | Points of convenience

N

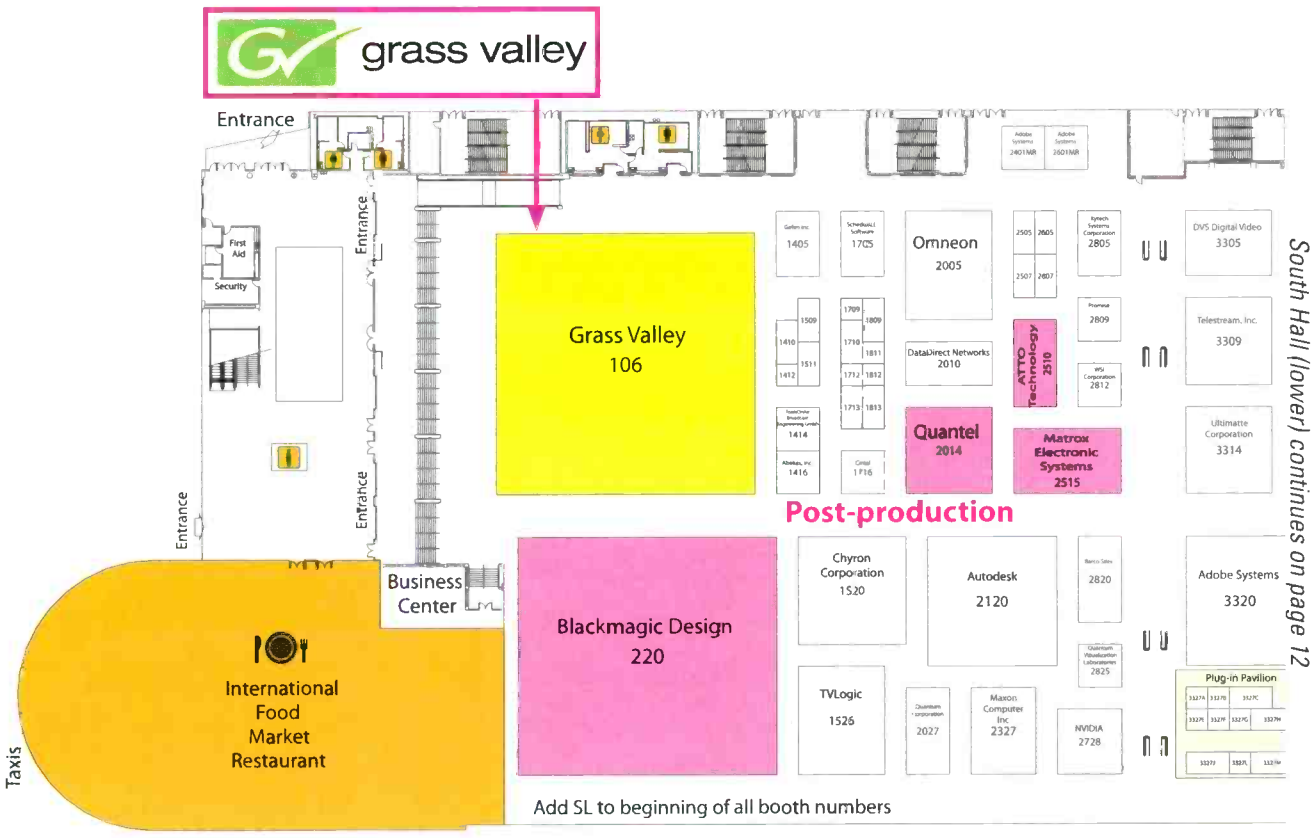
South Hall (upper) continues on page 9



See Broadcast Engineering at booth #N408 on page 5

SOUTH HALL, lower level

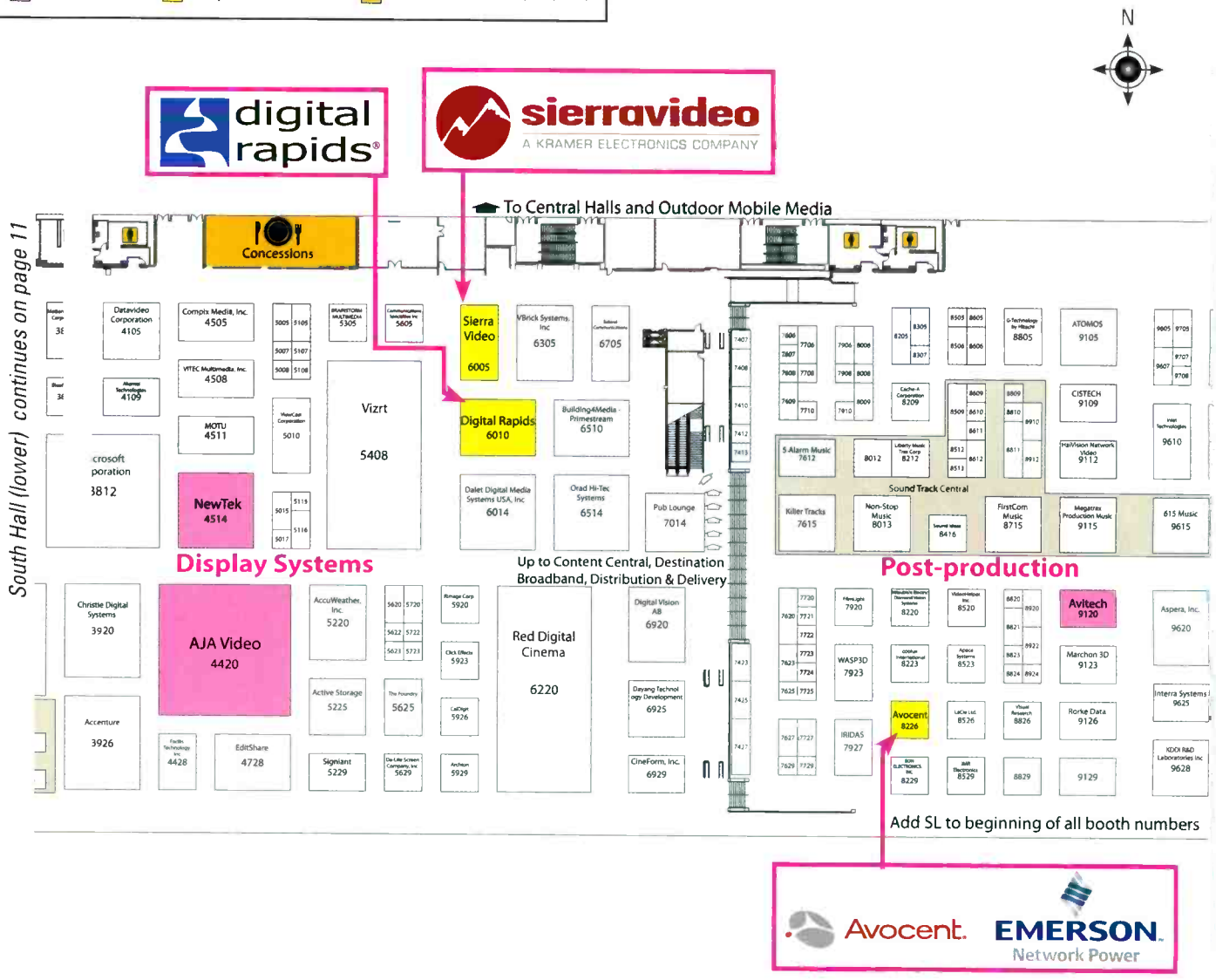
NAB Exhibit Hours, April 11-14, 2011
Mon.-Wed. .....9 a.m.-6 p.m.
Thurs. .....9 a.m.-2 p.m.



See Zeus at booth #N705 on page 5

SOUTH HALL, lower level

Advertisers | Map advertisers | Points of convenience

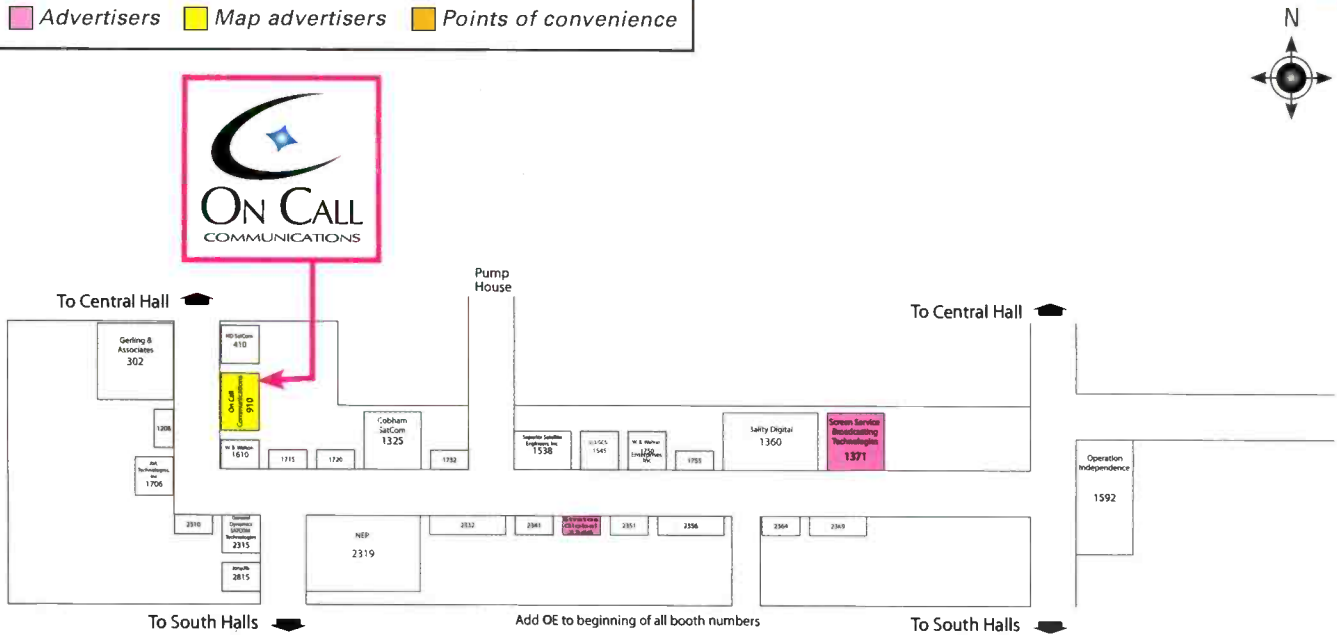


See Sierra Video Systems at booth #SL6005 on page 12

NAB Exhibit Hours, April 11-14, 2011
Mon.-Wed. .....9 a.m.-6 p.m.
Thurs. .....9 a.m.-2 p.m.

OUTDOOR MEDIA & EQUIPMENT

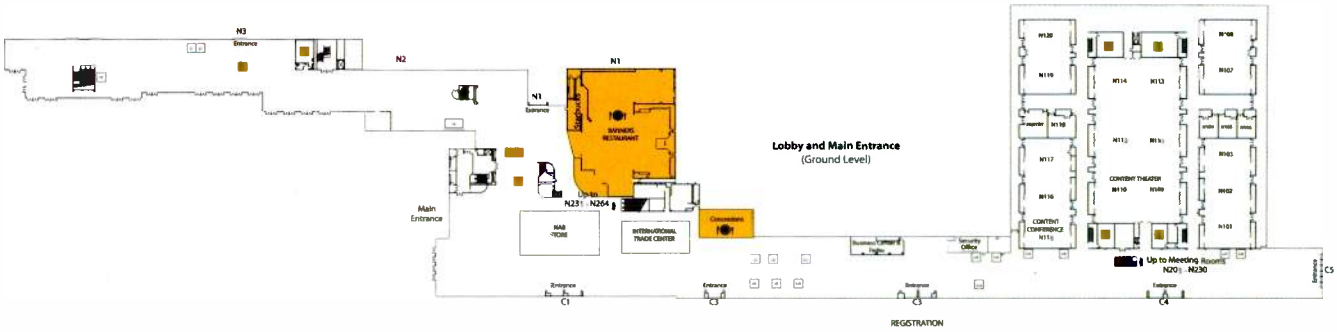
Advertisers | Map advertisers | Points of convenience

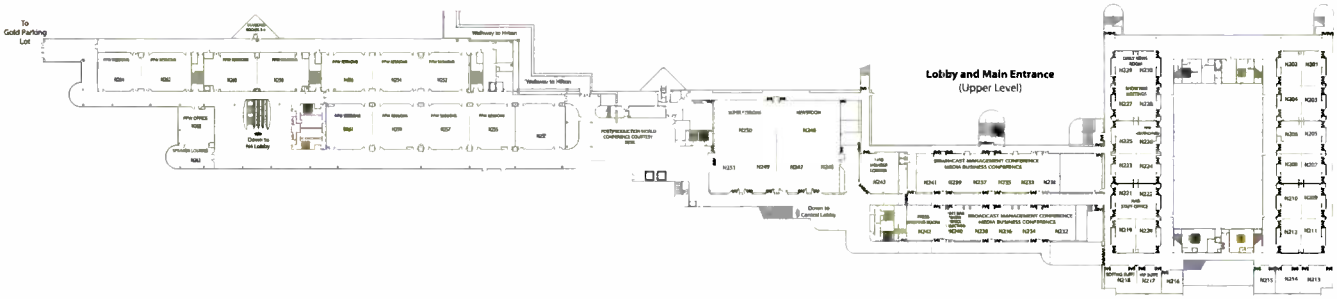


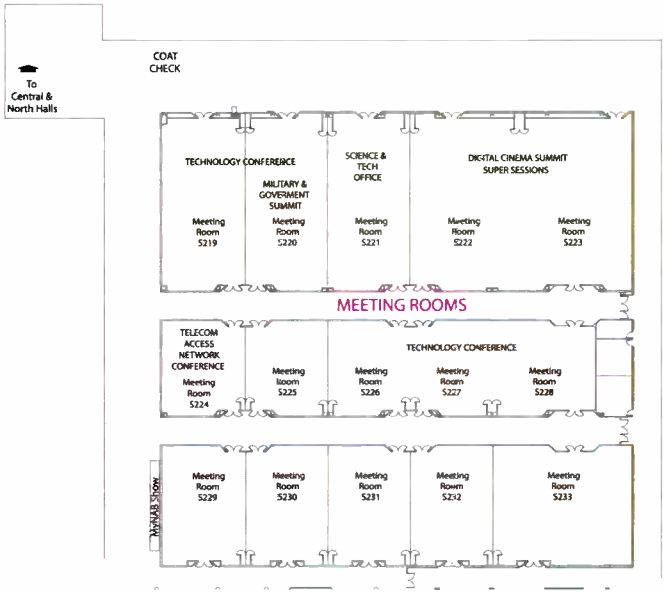
See On Call Communications at booth #OE910 on page 14

MEETING ROOMS

NAB Exhibit Hours, April 11-14, 2011
Mon.-Wed.....9 a.m.-6 p.m.
Thurs.....9 a.m.-2 p.m.







MAP INDEX

KEY

Here is a key to help you understand the NAB's hall lettering and numbering system.

C = Central Hall
N = North Hall
OE = Outside Exhibits
SL = South Hall, Lower Level
SU = South Hall, Upper Level

MAP INDEX

COMPANY	BOOTH	PAGE
Imagineer Systems	SL3327H	11
I-Movix	C4644	6
Impire	SL8008	12
INA	N5832	4
Independent Audio	C3139	6
indiSYSTEM	C7341	6
Industrial Acoustics	N1615	5
Ineoquest	SU2226	8
Inlet Technologies	SL9610	12
Inmarsat Global	SU6210	8
Innovision Optics	C7537	6
Inovativ	C12722	7
Integral Systems	SU7306	9
Integrated Microwave Tech.	C6432	6
Intel Storage Solutions Theatre	SU823	8
Intelsat	**SU4310**	**8**
Inter BEE	C11445	7
Inter Video 3D	C12440	7
International Datacasting	SU5513	8
International Supplies	C11823	7
IMDA	N3239	5
Interra Systems	SL9625	12
intoPIX	C5145	6
IO Industries	C7240	6
ioko	SU10513	9
iPharro Media	N1431	5
IPV	N4017	5
Irdeto	C12349MR	7
IRIDAS	SL7927	12
Irt Electronics PTY	SU9420	9
IRTE	SU2621	8
Isilon Systems	**SL11614**	**13**
iStar USA	SL10813, SL10913	13
iStoragePro	SL7427	12
itl	C1133	6
iZotope	C3132	6

J

J A Taylor & Associates	OE2341	14
J.L. Fisher	C6342	6
Jag35 Media	C11541	7
Jampro Antennas	C2307	6
Jenco Technologies	SU6012	8
JK Audio	C153	6
J-LAB	C3940	6
JLCooper Electronics	N1616	5
JMR Electronics	SL8529	12
JonyJib	OE2815	14
Joseph Electronics	C5350	6
Jünger Audio	**C6742**	**6**
JVC Professional	C4314	6

K

K2E	N3537	5
K5600	C2546	6
KAE	C8437	7
KATA	C6925	6
Kathrein, Scala Division	C2049	6
Kay Industries	C1114	6
KB Covers	SL5108	12
KCEI	C1754	6
KDDI R&D Laboratories	SL9628	12
Keisoku Giken	C12430	7
Keith Austin	C12126	7
KenCast	SU5302	8
Kern electronic	C8140	7
Killer Tracks	SL7615	12
Kings-Winchester Electronics	SU3902	8
Kino Flo Lighting Systems	C3743	6
Kintronic Labs	C3010	6
Kit Digital	N6729	4
Klotz Digital	C8447	7
KOBA 2011	C11547	7
Kobold	C4748	6
Konica Minolta Sensing Americas	SL8823	12
Korea Pavilion	SU2220	8
KPFF Consulting Engineers	C2025	6
Kramer Electronics	SL6005	12
Kroma Telecom	SL7627	12
KTech Telecommunications	SU9719	9
K-Tek	C8325	7
Kulabyte	SL10211	13

L

L-3 GCS	OE1545	14
LaCie	SL8526	12
Lanjian Electronics	C8229	7
Larcan USA	SU3717	8
Lasergraphics	SL10320	13
Lawo	**C2628**	**6**
Lawson & Associates/ Architects	C3651	6
LCDVF USA	C9921	7
LEA International	N6509	4
Leader Instruments	C7833	7
Lectrosonics	C1320	6
LEDZ/ESS	C2860	6
Leightronix	C9015	7
Lemo USA	C9012	7
Level 3 Communications	SU9502C1	9
Levels Beyond	SL9908	13
Libec Sales of America	C8008	7
Liberty Music Trax	SL8212	12
Lightcraft Technology	SL10312	13
Lightwave	SU11119	9
Linear Acoustic	**SU3326**	**8**
Linear-TV Broadcast	SU4905	8
Link Electronics	N2834	5
Litepanels	**C6025**	**6**
LiveTouch Broadcast Solutions	SL7723	12
LiveU INC	SU8808	9
Location Sound	C1625	6
LogicKeyboard/BSP	SL7623	12
Logicube	N3837	5
Logitek Electronic Systems	C2013	6
Lowel-Light Mfg.	C8818	7
LSI	SL10807	13
Lumantek	SU7926	9
Lynx Technik	N820	5

M

MaestroVision	N5020	4
Magnum Semiconduc.	S116LMR, SL12416	13
Magnum Towers	C1057	6
MainConcept	SU6721	9
Mainstream Network	C544	6
Manfrotto	C6925	6
Manhattan Production Music	SL8912	12
Manios Digital and Film	C9921	7
Manzanita Systems	SU6910	9
Marchon 3D	SL9123	12
Mark Roberts Motion Control	C5450	6
Markertek	C5643	6
Marquise Technologies/Sondor	SL7607	12
Marshall Electronics	C6419	6
Masstech Group	N5218	4
Masterclock	C5640	6
Matrox Electronic Systems	**SL2515**	**11**
Matthews Studio Equipment	C3251	6
Maxell	C4309	6
Maxon Computer	SL2327	11
Maxx Digital	SL7412	12
Mayah Communications	C556	6
MBT	N1103	5
Media 5 SRL	N3531	5
Media Data Governance Group	SL11908	13
Media Excel	SU7822	9
Media Links	SU1706	8
mediaproxy pty	SU6512	9
Mega Speed	C9448	7
Megatrax Production Music	SL9115	12
Merging Technologies	C3239	6
Micro Communications (MCI)	C2313	6
Microboards Technology	SL5620	12
Micronetixx Communications	C3028	6
Microsoft	SL3812	12
Microspace Communications	SU817	8
Microwave & RF Resources	SU5705	8
Middle Atlantic Products	C10845	7
Mier Comunicaciones	SU9717	9
MikroM	C8742	7
Miller Camera Support	C8019	7
Mindspeed Technologies	N302	5
Minerva Networks	SU9502A1	9
Minicaster c/o TV1	SU9502G3	9
Minnetonka Audio Software	SL9708	12
Miranda Technologies	**N2515**	**5**
MiraVid	SU4602	8
Mirror Image Teleprompters	C1344	6
Miteq/MCL	SU2713	8
Mitsubishi Electric	SL8220	12
Mobile Power	OE2310	14
MOG Technologies	SU4607	8
Mole-Richardson	C2849	6
Monarch Innovative Tech.	SL10316	13
Motion Analysis	SL3805	12
Motorola	SU2912	8
MotoSAT	OE2356	14
Motu	SL4511	12
MTD Systems	SU9122	9
MultiDyne	C6537	6
Multiquip	N2637	5

MAP INDEX

MAP INDEX

Back cover: See Grass Valley at booth #SL106 on page 11

See Ensemble Designs at booth #N1323 on page 5

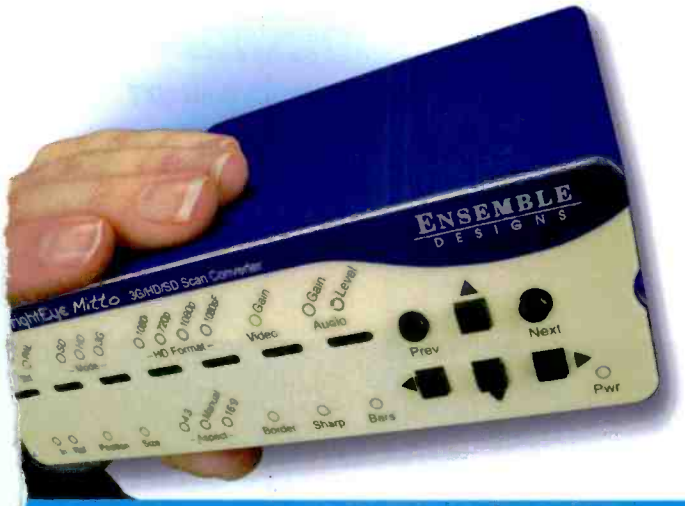
Does your scan converter do this?

Upconvert YouTube and Skype to full screen HD.

Computer desktop

YouTube video upconverted to full screen HD SDI video

BrightEye Mitto™ Scan Converter is the new way to take YouTube™, Skype™ video, weather radar, maps and viewer emails to your SD, HD or 3 Gb/s master control or routing switcher. Even a small part of the computer screen is upconverted to full screen HD video.



- High Performance Scan Converter
- Proprietary scaling and new filtering system outputs maximum detail, flicker-free video
- Genlock reference input, timeable output
- Easy-to-use Mac and PC interfaces, too
- New iPhone™ and iPad™ support

Tel +1 530 478 1830
www.ensembledesigns.com
NAB N1323

ENSEMBLE
DESIGNS

Purveyors of Fine Video Gear - Loved By Engineers Worldwide

See us at NAB
Booth SL 106

Trinix NXT

Bottom line: Trinix NXT has better operating costs than any of its competitors

Ask any of our thousands of satisfied customers, Trinix just works. Add new features or even upgrade to a new format, including 3G, and you still get the same independently certified highest quality signal performance – without the expense of new frames or recabling your system. But one of the biggest benefits of Trinix that all of our customers enjoy is the *lowest operating costs of any comparable routing switcher solution* on the market. Find out how Trinix NXT can improve your ROI at **www.grassvalley.com/trinix_nxt**.

when the world is watching...
we're there

grass valley

DTV MARKETPLACE

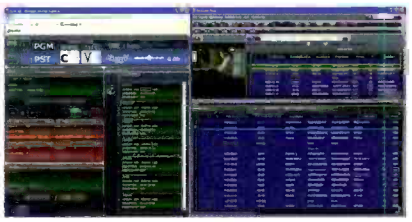
Color indicates advertisers

SCHEDULING, MAM SYSTEM
MediaGeniX WHATS'On Generation 4

Fully integrates VOD in the company-wide multimedia scheduling process; new transaction system, based on active change propagation, automatically updates user screens in real time; provides chat functionality, presence registry, collision detection and transaction merging.

+32 2 467 34 30; www.mediagenix.tv
Booth: N5129

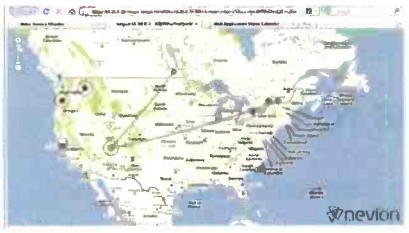
VIDEO SERVER TECHNOLOGY
Florical Acuitas



Commodity-based hardware video server technology provides reliable and affordable HD playout, graphics, effects and frame-accurate switching within the box; allows users to build an entire TV station for a quarter of the cost of traditional hardware and no longer be restrained with an infrastructure at one location; wake up components from anywhere with SMART Central technology allows control of all channels from any station at anytime.

352-372-8326; www.florical.com
Booth: N5011

CONNECTION MANAGEMENT SOFTWARE
Nevion VideoIPath



Simplifies video-over-IP deployment with key scheduling, provisioning and monitoring of video-over-IP services; Web application provides a complete overview of scheduled and in-service connections; to achieve efficient use of network resources and avoid overbooking, broadcasters can schedule connections based on service profiles, monitor video ports and bandwidth utilization, and access map and timetable views for video services.

800-515-0811; www.nevion.com
Booth: SU7217

REPLAY SYSTEM
Grass Valley K2 Dyno

Now shares content on a K2-SAN and streamlines file-based content creation operations for broadcasters, sports production companies and others; captures live events in HD resolutions and instantly plays highlights and playlists at variable speeds for critical analysis; supports DVCPRO and AVC-Intra 50/100 compressions; features a built-in VGA multiviewer and SDI video monitoring.

503-526-8100; www.grassvalley.com
Booth: SL106

AUTOMATED PLAYOUT SYSTEM
Miranda Technologies
Playout Glass Cockpit

Combines highly automated multichannel content delivery, rich graphics and advanced monitoring systems; integrates the iTX IT-based automated playout with Kaleido multiviewers and the iControl Playout Manager facility monitoring; also incorporates a range of broadcast infrastructure products, including intelligent switching and loudness management.

514-333-1772; www.miranda.com
Booth: N2515

NEWSROOM COMPUTER SYSTEM
OCTOPUS Newsroom OCTOPUS6

Runs natively on Mac OS X, Linux and Windows; installation-free client and centralized updates; features seamless load-balancing and automatic fail-over; includes editorial tools such as spell check, word blacklist, rundown buddy, rundown stopwatch and rundown time markers; includes plug-in for Final Cut Pro integration.

+420 22 118 1511; www.octopus-news.com
Booth: SU820

Color indicates advertisers

NEWSROOM COMPUTER SYSTEM
QTV/Autocue Autocue Newsroom

Provides a robust, reliable solution for full-scale newsroom computer system functionality with a full range of multiuser production, administration and management tools, including script and rundown management, wire service receipt and distribution, script archiving, assignment and contact lists, user messaging, built-in Internet access, media browsing and integrated prompting; offers playout automation for live programs with interfaces to all common broadcast devices.

212-929-7755; www.autocue.com
Booth: C8525

REMOTE PLAYOUT SYSTEM
PlayBox Technology Remote Playout

Provides a tapeless, file-based operation that has two parts: one integrated with the broadcast center and the other at the remote site; at the broadcast center, it is fully integrated into the current or preferred systems, including traffic, storage, MAM, ingest, transcoding and file transfer systems; connects to the remote site's playout equipment via the public Internet.

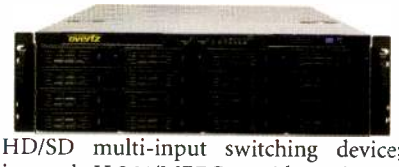
404-424-9283; www.playbox.tv
Booth: N5835

TRAFFIC AND SCHEDULING SOFTWARE
Video Stream Networks VSNCREATV 3.0

New and enhanced user interface offers an optimized arrangement of menus; new sales management module allows adding advertising contracts and clients, and checking their reliability; a new module has been added that allows users to register all aired commercials and generate reports integrated with the accounting and financial system (SAP); commercial opt-out system enables managing commercial airings and classifying them by channel or geographical area to meet different audience targets.

305-629-3603; www.vsn-tv.com
Booth: N1208

CHANNEL IN A BOX
Evertz OvertureRT LIVE



HD/SD multi-input switching device; internal H.264/MPEG-2 video playout server; features advanced branding capabilities, including character generation for real-time updating of text; offers DVE effects for squeeze backs and reveals, partitioned storage for online video playout and animated graphics playout, simultaneous playout of HD and SD content with internal conversion, and redundant power supplies; provides hot swappable 1TB of storage, upgradable to 2TB.

905-335-3700; www.evertz.com
Booth: N1602, SU9717

Camera support, robotics, virtual sets, batteries

ROBOTIC LINKS
Telecast Fiber Systems T-POV Robotic Links

Designed for robotic cameras; deliver the established functionality of the company's original HD/POV solutions; feature the option of Ethernet control; enclosed in small, ruggedized housings.

508-754-4858; www.telecast-fiber.com
Booth: C8925

BATTERY
PAG L95eR

14.8V 6.5Ah lithium-ion broadcast battery has a maximum continuous output current rated at 7A; designed to communicate with the Red One camera's viewfinder data display, enabling the camera operator to monitor battery capacity while shooting; provides one hour and 15 minutes of continuous run time for the Red One camera alone.

+4420 8543 3131; www.paguk.com
Booth: C9921

HD PRODUCTION SYSTEM
Azzurro Systems Integration
AzzurroCam Remote

A remotely operated version of the AzzurroCam HD production system; designed to give sports leagues and news networks the ability to manage multi-site interviews with coaches, players and analysts from one location; serves as a complete remote studio capable of controlling professional cameras, lighting and audio all through a single simple user interface.

201-767-0850; www.azzurrosi.com
Booth: N1331

TOUCH-CONTROL SYSTEM
Shotoku TR-T Touch Control System

New release enhances numerous areas of the system operation to meet the demands of customers seeking larger, more complex facility-wide installations; increasingly, large operations require ultimate flexibility to enable any control system in any location to rapidly reconfigure for control of cameras and studios in other physical locations; the TR-T system has always supported this functionality but now makes the task of reconfiguration even easier and quicker.

310-782-8491; www.shotoku.tv
Booth: C8528

PAN/TILT HEAD
Telemetrics PT-RM-1

Features heavy-duty bearings and a belt drive system; allows motion through sequence of position or motion record playback; capable of various operating speeds,] including a velocity range of 0.005 degrees to 90 degrees per second and acceleration speed of 180 degrees per second; multiaxis control includes pan, tilt, zoom, focus, track, Televator, dolly, iris and master pedestal.

201-848-9818; www.telemetricsinc.com
Booth: C9529

Cameras, lenses, accessories

TALLY LIGHT
Brick House Video TallyHo!

Wireless system offers camera operators remote on-air indication in the field; comprised of a base station with direct interface to the local vision mixer and a set of hot-shoe-mounted receiver modules.

+44 1962 777733
www.brickhousevideo.com
Booth: N6531

WIRELESS SYSTEM
Panasonic

Designed for the AJ-HPX3100 1080p P2 HD camcorder; simplifies the process of using user-selected metadata; comprised of the AJ-WM30 wireless module and AJ-SFU3100 software; promotes a seamless transfer of critical camera information between the HPX3100 and a range of devices such as PCs, iPads and iPhones.

877-803-8492
www.panasonic.com/broadcast
Booth: C3707

Color indicates advertisers

OUTDOOR REMOTE-CONTROL CAMERA
Canon BU-46H

A new 2X digital extender doubles the image size of distant objects captured with the camera's 20X Canon HD zoom lens; includes a newly designed Night Mode feature that works by slowing down the shutter speed to a minimum of ¼ (60i, 30F) or 1/3 (50i, 25F, 24F), allowing frame accumulation that elevates camera sensitivity; features a weatherproof housing that meets the IP-45 specifications for dust- and waterproof-efficiency, as well as a remote-control ND (neutral density) filter; designed for exterior POV applications.

516-328-5000; www.usa.canon.com
Booth: C4325

B4 MOUNT ZOOM LENS
Fujinon XA20sx8.5 BRM

Features 20X zoom for 2/3in cameras, focal length of 8.5mm to 170mm; maximum relative apertures of 1:1.8 (8.5mm to 113 mm) and 1:2.7 (170 mm); offers QuickZoom, Innerfocus, and Digital Servo.

973-686-2405; www.fujinon
Booth: C7525

MPEG-4 WIRELESS CAMERA TRANSMITTER
Vislink News and Entertainment LINK XP1310

H.264-compliant HD wireless camera transmitter for the news and entertainment; when combined with the Lynx Diversity Receiver, it offers a Web browser-controlled, rapidly deployable wireless camera solution for both traditional and new media broadcasters; field upgradeable with HD-SDI, ASI, IP and composite video inputs, as well as dual-input SD encoding; transmit-capable with up to 200mW output; available in 2GHz and 7GHz variants.

978-671-5700; www.vislink.com
Booth: C6019

HD CAMERA
Broadcast Microwave Services BMS UL HD

Features 120X zoom ratio (10X optical and 12X digital), lightweight and compact housing, HD-SDI video output, power consumption of 6W, slow shutter, spot AE function, and picture freeze function.

858-391-3050
www.broadcastmicrowave.com
Booth: C4837

HD LENS
Thales Angenieux 14 x 4.5 HD Video Wide-Angle Lens

Offers a focal range of 4.5mm to 63mm (9mm to 126mm with 2x extender) and an aperture of f/1.8 (4.5mm to 41mm); available in semi-servo and full-servo versions, as well as with 16-bit digital connection for zoom and handle connection.

973-812-4326; www.angenieux.com
Booth: C6037

CAMERA
JVC GY-HM750U

Records native HD or SD footage in ready-to-edit file formats on low-cost SDHC memory cards; equipped with the same 3-CCD imaging system found in the GY-HM790U; delivers 1920 x 1080 images in a small, lightweight form factor; records at selectable data rates up to 35Mb/s and can record HD footage in 720p, 1080p and 1080i, as well as SD footage (480i); records in ready-to-edit file formats for Apple Final Cut Pro or Adobe Premiere (.MOV), as well as other major NLE systems that are compatible with Sony XDCAM EX files (.MP4).

973-317-5000; pro.jvc.com
Booth: C4314

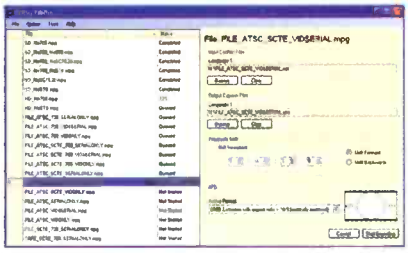
ON-CAMERA MONITOR
Marshall Electronics
V-LCD70XP-HDMIPT

Allows camera operator to pass through the HDMI video input from the monitor to another monitor for a client, director, focus puller or crew/talent member to view on-location; includes composite and component inputs, HDMI pass through, DSLR ratio adjustment, adjustable backlight and markers, HDMI auto color space and ratio detect, manual gamma adjustment, image flip, 1/4in-20 mounting on all sides, and a power switch.

310-333-0606; www.lcdracks.com
Booth: C6419

CGs, prompters, captioning

CAPTION ENCODING TOOL
EEG CCPlay FilePro



Encodes captions, AFD and XDS directly into compressed video formats with no generational loss; capable of performing HD MPEG-2 and MXF XDCAM caption encoding at rates of 10X real time or more; combines maximum post closed-captioning efficiency, accuracy and reliability with intuitive point-and-click or batch-based modes of operation.

516-293-7472; www.eegent.com
Booth: N4029

CAPTIONING SYSTEM
XOrbit Tango

Eliminates all tape encoding, shipping, duplication and phone lines; interfaces directly with automation playlist for real-time changes; encodes captions to CableLabs specifications for VOD content; encodes CC1, CC2, CC3 and/or CC4 from four unique stenographers in different locations; single, all IP-based user interface; includes a real-time language filter for live and offline captioning.

301-362-9500; www.xorbit.com
Booth: N4918

Color indicates advertisers

Graphics, animation products

GRAPHICS PLATFORM
Chyron AXIS

Cloud-computing graphics creator is designed to simplify, streamline and facilitate the graphics creation workload across many users in a broadcast operation; AXIS services include high-resolution maps, 3D charts, financial quotes and a virtually unlimited set of tools for topical news graphics creation; provides broadcast production staff with prebuilt templates that they can leverage for quick creation of graphics for multiple outlets.

631-845-2000; www.chyron.com
Booth: SL1520

Intercom, IFB products

FIRMWARE UPDATE
Clear-Com Eclipse Digital Matrix System v5.2

Enhancements include the capability to show graphical audio levels in real time; comes with a preset factory configuration; finds matrices and panels connected to the frame via IP; new IP-based audio level monitor card, the LMC-64, enables the Production Maestro Pro to use Clear-Vu Audio Metering; using two standard scaling options, Nordic and VU, users can monitor and adjust audio levels with the click of a mouse.

510-337-6600; www.clearcom.com
Booth: C6647

Lighting equipment

FRESNELS
Litepanels Sola 6, Sola ENG

Capable of focusing output from a 70-degree to 10-degree beam and dimming from 100 percent to zero with no color shift; Sola 6 has a 6in Fresnel lens and draws 75W while providing light output equivalent to a 650W tungsten Fresnel; Sola ENG has a 3in Fresnel lens, and is small and lightweight enough for on-camera use in an ENG or remote application.

818-752-7009; www.litepanels.com
Booth: C6025

PERSONAL BROADCAST LIGHTS
Videssence See-Me Lite

LED lights produce soft, comfortable, nonglaring lighting for personal image broadcasting via webcam; boosts the vertical light levels on the face and features to separate the face from ambient lighting for the camera; 100V or 240V; each 4W fixture provides 3000K color.

626-579-0943; www.videssence.tv
Booth: C2944

Media storage, archive systems, asset management

RAID STORAGE CONTROLLER
ATTO Technology FastStream RAID Storage Controllers

Provide 8Gb/s Fibre Channel or 6Gb/s SAS host connectivity to multiple tiers of SAS/SATA disk storage enclosures; allows for up to 30 streams of HD video served out to multiple workstations; prevents false drive failures, eliminating wasted time replacing good drives; full stream counts are maintained during a drive failure.

716-691-1999; www.attotech.com
Booth: SL2510

CLUSTERED NFS SERVER
Evertz EMS

Highly scalable and high-performing clustered NFS server; offers fault-resilient multitiered core storage; features ingest client with browse proxy and confidence playback, jog/shuttle controls for stored content or live ingest, file ingest with NativPlay for fast real-time ingest, and multichannel playout client with simulcast HD/SD output; media clients are available with optional local storage.

905-335-3700; www.evertz.com
Booth: N1602, SU9717

Color indicates advertisers

Color indicates advertisers

MEDIA ASSET MANAGEMENT MODULE
Myers Information Systems
ProTrack MAM

Automates digital media workflow by directing the movement of assets throughout the broadcast content life cycle; provides an affordable and effective solution for managing content using business rules-based control over digital files to assure content is available where and when it is needed; ensures that multichannel content is identified, catalogued, moved to/from the playback server and archived.

413-585-9820; www.myersinfosys.com
Booth: N3434

CLOUD-BASED MAM
Quantel QTube

Enables anyone involved with the production process, wherever they are in the world, to view, log and edit material itself located anywhere in the world; engineered to operate in the conditions provided by public Internet connections, where bandwidth, latency and availability are continuously variable; usable workflow will operate at bandwidths as low as 300kb/s and with latency in the range of hundreds of milliseconds.

212-944-6820; www.quantel.com
Booth: SL2014

MOBILE VIDEOTAPE INGEST FLYPACK
Alteran Technologies
ViTaDi AutoPack

Updated four-channel Version 2.0 features revised master control that organizes and monitors the workflow process, multiclip capture mode, time code break mode and onboard storage; supports native file formats, including QuickTime, MXF and OP-atom; works with customer-supplied VTRs or with either automatic or semi-automatic ViTaDi playback configurations.

818-998-9100
www.alterantechnologies.com
Booth: N5537

STORAGE SYSTEM
Isilon Systems S-Series Nodes

Capable of more than 1.7 million I/O operations per second and 45GB/s of aggregate throughput from a single file system; up to 2.3TB of globally coherent cache; uses SSD technology for file-system metadata, delivering high performance for metadata-intensive operations while improving overall latency; ideal for broadcast, real-time streaming, rendering and post production.

206-315-7500; www.isilon.com
Booth: SL11614

ASSET MANAGEMENT SYSTEM
Front Porch Digital
DIVAdirector v4.1

Enables operators, using their Web browser, to search, locate and retrieve stored media assets directly from their desktops; adds a revamped and simplified browser interface, support for identification and retrieval of clips with noncontiguous time code, partial-restore format auto detection to further simplify user interaction with the complex format/wrapper challenges handled by DIVArchive, and management of remote proxies without the need for their replication specifically for DVIAdirector; offers enhanced integration with SAMMA Solo system.

303-440-7930; www.fpdigital.com
Booth: N5806

CONTENT DELIVERY SYSTEM
Digital Rapids MediaMesh 1.2

Combines a robust delivery framework with flexible, full-featured receiving appliances, providing efficient transfer of file-based digital media between content providers, contributors, aggregators and distribution partners; optimizes the delivery of HD, SD and Digital Cinema content over terrestrial IP networks and satellite; features new sending and contribution tools.

905-946-9666; www.digital-rapids.com
Booth: SL6010

CONTENT PRODUCTION MANAGEMENT SYSTEM
EVS IPDirector

New API and MOS protocol support ensure full interoperability with all types of third-party systems, such as asset management, automation and NRCS including Avid I-News, ENPS or Annova systems; expands integration with NLE systems, including media exchange with Avid editors and new EVS FCP Export Plug-in designed for Apple Final Cut Pro users, which allows export of edited sequences or job requests to an EVS server or nearline storage

818-846-9600; www.evs.tv
Booth: C9508

NEWS PRODUCTION SUITE
Dalet Digital Media Systems
Dalet News Factory

Applies the principle of story-centric production, in which all departments of the newsroom collaborate in a multimedia-oriented production; integrates desktop scripting with video and multimedia tools, providing a smooth, intuitive workflow, from ingest through automated playout and multiplatform delivery; automates many tasks and processes for additional efficiency.

212-269-6700; www.dalet.com
Booth: SL6014

SHARED STORAGE SYSTEM
Small Tree GraniteSTOR ST-RAID II

Ethernet-based shared storage system supports 6Gb SAS/SATA protocol end-to-end; includes direct attached shared storage technology designed specifically for Final Cut post-production professionals looking for economical, functional and easy to manage storage solutions; low latency ensure there are no dropped frames in SD or HD; available in 8-, 12- or 16-drive (1TB, 2TB or 3TB drive) configurations.

651-389-9950; www.small-tree.com
Booth: SL10505

CONTENT LIBRARY
SeaChange International Universal Media Library 7200

Fuses traditional linear playout support with production and streaming capabilities into an all-in-one solution; supports studio and post-production workflows as it integrates with nonlinear editing systems like Final Cut Pro and Avid; allows edit-in-place, which lets users edit content that is simultaneously being ingested; supports extremely large files (up to 32TB for single files); provides storage capacity of up to 144TB in 9RU.

978-897-0100; www.schange.com
Booth: N4319

FUJIFILM

ZA SELECT

From the studio to the field Fujinon has you covered.

ZA12X4.5BERM ZA17X7.6BERM ZA22X7.6BERM

HD lenses for every production...every budget.

- Optimized optics
- Two times extender
- Value priced
- Widest angle
- Full feature control
- RS-232 Interface
- Robotic Cortrol
- Integrated Diagnostics

Visit us at NAB Booth C7525

FUJINON
www.fujinon.com

Color indicates advertisers

SERVER
Streambox Enterprise Server

Captures content at a lower cost by providing an acquisition platform that can be used to manage and play out live and file-based video sent from the field; complete package consists of the Distribution Server, Store and Forward Server, and Interrupted Feedback Broadcast (IFB), which work together to provide an end-to-end solution; automatically archives all video streams to be available for download at a later time.

206-956-0544; www.streambox.com
Booth: SU1702

MAM SYSTEM
SGT VEDA

Software suite integrates video content management for traditional broadcasters with the need for multiple delivery models; provides program management including rights management from contract to usage; ingest management detects and imports any sort of clip automatically; search and retrieve component looks at the meaning behind the words to return any relevant media, ignoring spelling errors in either the metadata or the search query.

+33 164 73 74 74; www.sgt.eu
Booth: N1402

UNIVERSAL DRIVE TRAY ADAPTER
Sonnet Technologies Transposer

Designed to take the hassle out of installing a 2.5in SATA SSD into a computer's drive bay or SATA storage system; users simply plug in and secure any 2.5in SATA drive to the Transposer, secure it to a 3.5in drive tray — either side or bottom mount — and then plug in the assembly; no adapter cables or additional brackets are required; standard mounting holes and connector placement assure universal compatibility between drives and trays; rugged construction is designed to keep its drives cool.

949-587-3500; www.sonnettech.com
Booth: SL9605

ASSET MANAGEMENT
RadiantGrid Technologies
RadiantGrid Platform

Adds live HD-SDI capture capabilities to record directly from live feeds that will be prepared for distribution; supports GPU-accelerated video preprocessing through its integration of the Cinnafilm Dark Energy plug-in, and audio upmixing, downmixing, loudness range control and multipass scaling through the Linear Acoustic AERO.qc processor; ingested files are immediately indexed for metadata, passed through an integrated QC tool and then transcoded to different file formats.

877-828-0094; www.radiantgrid.com
Booth: SU3725

STORAGE PLATFORM
SAN Solutions ArtiSAN 9400 series

Designed for high-performance film and video applications; supports multiple streams of 2K/4K media, as well as all HD video streams, including 3G and 3D applications; is offered in both a 2RU, 12-bay, 3.5in drive enclosure form factor and a 2RU, 24-bay, 2.5in drive enclosure form factor; includes SAN Solutions' dual active RAID controllers, featuring high-performance hard disk and solid state drives.

866-661-7144; www.sansolutions.com
Booth: SU3725

SCALABLE STORAGE SYSTEM
SGL FlashNet

Modular structure provides systems that start on a single server for smaller organizations and scale to a cluster with a theoretically infinite number of identical nodes; clustered architecture provides reliability levels; identical software is installed on all members of the cluster, allowing any machine to perform any task; in the event that a server fails or is taken down for maintenance, workload is taken over automatically by another node in the cluster.

615-324-6075; www.sglbroadcast.com
Booth: N2821

VIDEO I/O MODULES
Harmonic Omneon MediaPort 7000 Series

Delivers new multicodec support with enhanced media processing functionality to streamline playout workflows and simplify the transition to HD; features full SD and HD back-to-back DV and MPEG-2 playback in any combination; optional support for additional codecs, such as AVC-Intra, playable back-to-back with DV and MPEG-2; SD upconversion, HD downconversion, and 1080i/720p crossconversion on every channel, regardless of media codec; simultaneous SDI and HD-SDI outputs for every channel; 1RU frame with dual hot-pluggable power supplies and support for one or two hot-pluggable dual-channel video modules.

408-542-2500; www.harmonicinc.com
Booth: SL2005

DAM PLATFORM
TMD i-mediaflex

Provides a Web-based applications environment for users to search, browse and create media workflow processes from the wider enterprise and beyond; features the ability to raise and administer media workflows from any location.

512-600-3133; www.tmd.tv
Booth: N3716

Color indicates advertisers

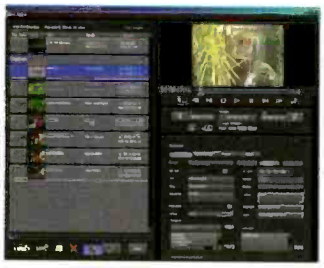
New media, streaming products, multimedia/Internet

MULTIFORMAT LIVE/ON-DEMAND ENCODER
Digital Rapids StreamZHD 3.5

Updated software extends output, automation and workflow integration capabilities; provides quality, flexibility, format support, efficiency and automation for transforming media for applications from post production to multiplatform live and on-demand distribution.

905-946-9666; www.digital-rapids.com
Booth: SL6010

CONTENT REPURPOSING AND DISTRIBUTION SYSTEM
Grass Valley MediaFUSE FX



Enables a "create once, publish everywhere" workflow for repurposing file-based or live content for Web and mobile distribution; automates the process of encoding, editing and uploading, and makes it possible to add rich metadata throughout the process; enables reporting/posting complete stories for online and mobile consumption, letting viewers choose between a quick overview or a full in-depth viewing experience.

503-526-8100; www.grassvalley.com
Booth: SL106

STREAMING DEVICE
ViewCast Niagara 4100

Stream HD content to broadband and mobile networks, including live adaptive streaming to Apple iPhones and iPads; ingests SD- or HD-SDI video, and accommodates a variety of audio types, including embedded SDI, AES/EBU, and balanced and unbalanced stereo; simultaneously streams multiple resolutions at multiple data rates in multiple streaming formats, including MPEG-4, Adobe Flash H.264, Windows Media (Silverlight compatible) and Apple iPhone.

800-540-4119; www.viewcast.com
Booth: SL5010

DISCOVER THE NEW STAR OF TV ONE

C2-8000 Series Universal Input Seamless Switcher

DVI-U
The Universal I/O
compatible with
HDMI, DVI-D, DVI-A,
RGBHV, RGBs,
RGsB, YUV,
YPbPr, CV,
Y/C

NOTEWORTHY FEATURES

- HIGH QUALITY SEAMLESS SWITCHING VIA 3 CORIO®2 SCALERS
- UP TO 12 DVI-U INPUTS, 2 DVI-U OUTPUTS
- UP TO 2 SD/HD/3G-SDI INPUTS & OUTPUTS + RE-CLOCKED OUT
- GENLOCK INPUT, TRI/BI WITH LOOP-THROUGH
- HDMI COMPATIBLE WITH FULL HDCP FEATURES
- CROSS-FADE, PUSH, WIPE & CUT TRANSITIONS
- DUAL PIP WINDOWING
- CHROMA AND LUMA KEYING
- PC RESOLUTIONS UP TO 2048X2048
- HDTV RESOLUTIONS UP TO 1080p60
- ANALOG TO DIGITAL CONVERSION
- 4:4:4 FULL BANDWIDTH SAMPLING
- DIGITAL FLICKER ELIMINATION
- TEMPORAL & DIAGONAL INTERPOLATION
- OPTIONAL REDUNDANT POWER SUPPLY
- LOGO INSERTION
- INTEGRAL AUDIO PROCESSING

TOLL FREE 800.721.4044
WWW.TVONE.COM • SALES@TVONE.COM

tvone

Color indicates advertisers

IP VIDEO DISTRIBUTION SYSTEM
Haivision Furnace 6.0

Designed for efficient and affordable distribution, capture and rebroadcast of HD video; recently upgraded to revision 1.5; now supports constant bit rate encoding to assure transport and systemwide compatibilities and, optionally, real-time metadata capabilities; provides H.264 encoding at up to 1080p60 with the lowest available end-to-end latencies.

877-224-5445; www.haivision.com
Booth: SL9112

VIDEO-OVER-IP CONTRIBUTION SYSTEM
Streambox Live Pro

Takes advantage of uncapped bandwidth, full D1 resolution and AAC; uses more available bandwidth on emerging 4G cellular networks to send professional quality video; enables broadcasters to enhance breaking news stories with ad hoc broadcasting content supplied by a variety of contributors, including video journalists and stringers.

206-956-0544; www.streambox.com
Booth: SU1702

NETWORKING AND COMPRESSION
Harris Selenio

Integrated media convergence platform combines traditional baseband video and audio processing, compression and IP networking features within a single 3RU platform; hosts up to 28 channels of high-density baseband video processing; supports both MPEG-2 and H.264 compression standards for SD, HD, mobile and 3Gb/s, as well as advanced audio capabilities, including 5.1 and loudness control.

800-231-9673
www.broadcast.harris.com
Booth: N2502

MEDIA SERVER
Wegener iPump 6400

Accesses data files via LAN connection; accesses VOD; creates multiple SD and HD channels; supports satellite and Internet file delivery; time-shifts programming; regionalizes program insertions; streams video to desktops or television monitors; supports seamless movement between live and file-based content distribution, as well as satellite and terrestrial distribution paths.

770-814-4000; www.wegener.com
Booth: SU4902

Production switchers, video effects, keyers

3G/HD/SD SWITCHER
Crystal Vision Safe Switch 3G

Provides clean, intelligent 2 x 2 switching between two 3Gb/s, HD or SD sources with a frame store synchronizer on each input, which can correct for any timing differences between the two; can be switched manually or automatically; synchronizer in each input stream ensures that both inputs to the switch are correctly timed to the external analog reference to avoid disruption during a switch; features 20 video and audio parameters that can be selected to perform a switch, as well as four combined condition parameters that only trigger a switch if all the conditions are met simultaneously; two fault indications can be set and assigned to GPIs to allow for flexible monitoring.

+44 1223497049; www.crystalvision.tv
Booth: N1520

VIDEO PRODUCTION SYSTEM
Broadcast Pix Granite 2000

Features a new, wide 1-M/E control panel that provides access to all video and file-based content; can enable a single operator or small team to create highly compelling live video; expands the number of input buttons from nine to 16 (32 with shift); doubles the number of keyer buttons from three to six and increases auxiliary output buttons from two to 10; adds key priority controls and mnemonics to display auxiliary output assignments; provides more device controls for faster access to file stores for clips, animations and graphics, as well as controls for external devices.

978-600-1100; www.broadcastpix.com
Booth: N4506

VIDEO LEGALIZATION/GRAPHICS COMPLIANCE SUITE
Eyeheight complianceSuiteMC

Suite of plug-ins for Avid Media Composer provide advanced video legalization and graphics compliance tools; legalEyesMC provides composite, RGB and composite + RGB legalization with support for NTSC (7.5 or 0 IRE setup) and PAL composite color spaces; clobbering overshoot suppression technology proactively reduces technical rejections; safeEyesMC provides comprehensive graticule support, including the latest SMPTE, ARIB, EBU and ITU-R requirements.

623-328-5800; www.eyeheight.com
Booth: N3719

1 MLE PRODUCTION SWITCHER
Ross Video CrossOver Solo

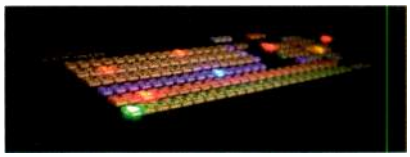
Features include 12 HD/SD inputs, internal multiviewer, two channels of 2D DVE, synchronization and up/downconversion, and four internal channels of media store for instant stills, keys and media wipes; has the same features and specifications of the CrossOver 12; however, the main electronics and signal I/O are combined with the panel as a single unit, reducing cost and size.

613-652-4886; www.rossvideo.com
Booth: N3807

VIDEO PRODUCTION SWITCHER
Grass Valley Kayenne

Increases the on-board video clip storage capacity and adds the ability to create sophisticated, multilayered on-screen effects; version 2.0 software introduces a ClipStore option; Key Chaining simplifies 3-D management by automatically bringing up two keyers for left eye/right eye with separate convergence adjustment; enhanced E-MEM allows the transfer of timeline effects between registers and between M/E channels.

503-526-8100; www.grassvalley.com
Booth: SL106



CONTROL SURFACE
NewTek TCXD850 CS

Hardware control surface for the TriCaster TCXD850 HD portable live production system; provides illuminated push buttons, twist knobs, a premium T-bar and three-axis joystick to control all of the functions and effects; creates complex switcher effects and assigns them as switcher channels, including live virtual sets and picture-in-picture elements.

210-370-8000; www.newtek.com
Booth: SL4514

Color indicates advertisers

Recording media

P2 PORTABLE DECK
Panasonic AG-HPD24

Features include 3D synchronized record/playback, native 24P recording with variable frame rates, fast USB 3.0 interface and 24 bit four-channel audio recording in AVC-Intra 100/50; designed to make 10-bit, 4:2:2 master-quality video affordable and portable; allows users to playback and review P2 cards on its 3.5in, 16:9 LCD screen, manage clip files and metadata, record full resolution 10-bit quality content from a wide range of Panasonic and non-Panasonic cameras via its HD-SDI input, and backup data onto hard disk drives.

877-803-8492
www.panasonic.com/broadcast
Booth: C3707

TAPELESS RECORDER
AJA Video Ki Pro Mini

Captures to the Apple ProRes 422 codec directly from camera; files are 10-bit, 4:2:2 and are immediately ready for editing; SD/HD-SDI and HDMI I/O; two channels of balanced XLR audio with switch selectable line/mic levels; eight channels of embedded digital audio over SDI and HDMI; records SD/HD files to Compact Flash cards.

530-274-2048; www.aja.com
Booth: SL4420

Satellite equipment, services

SATELLITE SERVICE
On Call Communications QuickSPOT On Demand

Always available and ready to use; within minutes of deploying a QuickSPOT antenna, the system is ready to begin transmitting HD/SD video feeds along with providing IFB-compatible phone lines and Internet access; pay-for-what-you-use billing system offers flexibility to access satellite time per minute without prescheduling or to purchase discounted prescheduled blocks of time.

949-707-4729; www.occsat.com
Booth: OE910

SATELLITE SERVICE
Stratos BGAN

High-speed wireless IP data (up to 492kb/s) and circuit-switched network; streaming IP data rates up to 384kb/s on demand; data and voice can be used simultaneously; GAN-standard 64kb/s ISDN, Fax and 4.8kb/s voice to fixed, mobile and any other MSS.

709-748-4844; www.stratosglobal.com
Booth: OE2346

Studio and support products, multi-image displays

LUMA MONITORS
Sony LMD-2341W, LMD-1541W

Built with a lightweight, aluminum chassis and slim bezels; ideal for remote trucks, ENG/EFP field work and rental applications; designed with Sony's 10-bit ChromaTru technology and new auto white balance calibration; inputs range from 3G/HD/SD-SDI to analog composite and HDMI inputs; offer in-monitor source display, waveform monitor, audio level meter, time code display and on-screen displays.

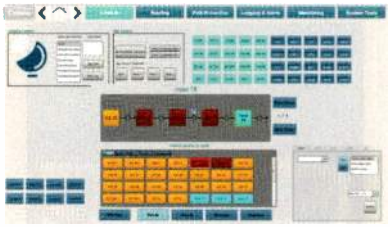
201-930-1000; sony.com/professional
Booth: C11001

MULTIVIEWER
Avitech International Sequoia 2H2V

Combines the Sequoia 2x2V and the Sequoia 4H to take up to two HDMI inputs and two DVI/I inputs; all input windows are freely adjustable and have full-screen capability; features a switching function for keyboard/mouse, USB hub, speakers and microphone.

425-885-3863; www.avitechvideo.com
Booth: SL9120

CONTROL AND MONITORING
Snell Centra V.1



Provides integrated, scalable control and monitoring; offers a variety of new features that simplify use and further unify control and monitoring across all media operations; extends support for Snell products, including the MV-Series of multiviewers, as well as more third-party control protocols to further expand its reach; features new tools, including wizards for router configuration, that speed and simplify installation of routing and modular installations.

212-481-2416; www.snellgroup.com
Booth: N1820

TECHNICAL FURNITURE SYSTEM
TBC Consoles IntelliTrac

Front and rear device tracks allow unlimited lateral positioning of critical monitors; rack bay turrets may be easily upgraded or relocated, allowing quick, user-friendly modifications; full range of articulating arms for distance, height and tilt control may be used for mounting flat-panel monitors, speakers, phones and task lighting.

631-293-4068; www.tbcconsoles.com
Booth: C12419

KVM APPLIANCE
Avocent AMX

Provides real-time user access to all major server platforms and serial devices; features full-system management with an advanced, Java-based administration tool, optimal video resolution and an on-screen graphical interface; operates over UTP cable infrastructure; optional skew compensation ensures video quality is automatically adapted to cable type and length.

256-430-4000; www.avocent.com
Booth: SL8226

IP MULTIVIEWER
Harris HView

Provides all the monitoring capabilities of a traditional baseband multiviewer but functions in a networked environment where the feeds being monitored are all compressed video or audio; supports multiple compression formats and resolutions; ideal for operators who use different codecs for different jobs — from high-quality H.264 to lower-bit MPEG-2; includes supports for virtual network connection control, which allows users to view and control PC-based devices; features RSS display and multiformat IP stream decoding.

800-231-9673
www.broadcast.harris.com
Booth: N2502

MONITORS
TVLogic VFM-056W/WP

Feature a high-resolution (1280 x 800) 5.6in LED backlit LCD panel housed in a lightweight yet durable magnesium alloy case; ideal for HDSLR and the latest digital cinema cameras; offered in two versions — basic (VFM-056W) and premium (VFM-056WP) — with features such as focus assist, and audio level metering/monitoring; WP also features waveform/vector scope and HDMI to HD-SDI loop out.

818-567-4900; www.tvlogicusa.com
Booth: SL1526

UNINTERRUPTIBLE POWER SUPPLY
Staco Energy Products FirstLine P

Three-phase UPS for 80kVA to 125kVA applications; features IGBT and DSP control, low-input current distortion for less than or equal to 3 percent, hot-swappable operation and an output transformer with galvanic isolation between the load and battery supply; up to eight units can be run in parallel for redundancy; includes user-friendly, menu-selectable display with an alarm, emergency power-off button and LED indicators for bypass, main line, battery powering the load, load on bypass and normal output.

937-253-1191; www.stacoenergy.com
Booth: C1110

Color indicates advertisers

MULTIVIEWER
Miranda Technologies
Kaleido-Modular

Cascading feature allows the system to provide monitoring with up to 24 pictures per monitor; designed around small building blocks with eight video inputs and dual monitor outputs; offers easy maintenance and resilience due to its small failure block; has a delay of less than half a frame; offers silent operation and high picture quality; can be used for monitoring stereoscopic 3-D, including dual 1.5Gb/s and dual 3Gb/s signals.

514-333-1772; www.miranda.com
Booth: N2515

MULTIVIEWER
Apantac TAHOMA-DL

Combines monitoring multimedia and broadcast quality inputs on the same multi-image display processing system; handles DVI, VGA, RGB, HDMI, Blu-ray DVD, DVD, component and S-video, as well as broadcast-quality 3G/HD/SD-SDI; applications include multichannel, multiformat live production when computer-generated inputs and live camera shots are being switched at the same time.

503-616-3711; www.apantac.com
Booth: N2530

LCD PRODUCTION MONITOR
Panasonic BT-LH910

Designed for field and studio applications; features a new high-brightness, high-contrast IPS panel; additional features include newly developed 3D assist functions and professional interfaces, including HDMI and 3G-SDI; can be used on-camera as an electronic viewfinder, on location and in mobile or live settings.

877-803-8492
www.panasonic.com/broadcast
Booth: C3707

OLED CRITICAL EVALUATION MONITORS
Sony BVM-E Series

Full-HD resolution OLED panels with 10-bit drivers with a newly developed display engine; OLED processor is designed to produce deep blacks with high dynamic range, blur-free motion, wide color gamut and accurate picture reproduction; available in 25in and 17in screen sizes; standard inputs include 3G/HD/SD-SDI, HDMI and DisplayPort; features include HD frame capture, pixel zoom and effects including side by side, butterfly, wipe and blending.

201-930-1000; sony.com/professional
Booth: C11001

3-D

FORMAT CONVERTER
Doremi Labs Dimension3D

Converts any 3-D format to another, including changing of the frame rates; allows for any 3-D input stream format to be used with all types of display components currently available; converts stereoscopic camera rig output to recorders and displays; encodes left- and right-eye streams into a single HD-SDI stream and back for recording 3-D content on standard HD tape and server technologies; USB connection provides for remote operation.

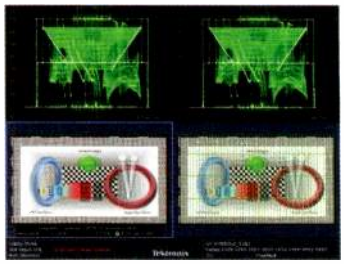
818-562-1101; www.doremilabs.com
Booth: C9515

STEREOSCOPIC 3-D MEDIA PLAYER
Miranda Technologies
Densité HMP-1801

Single-card, solid-state stereoscopic 3-D media player uses Compact Flash for robust media storage, with instant playout of 1080i and 720p HD or SD; includes media workflow tools for clip ingest, content management and playback with playlist support; content is loaded via 10/100Mb Ethernet media transport port, and a copy of the output is available as a confidence monitoring stream over IP; automated control is available via GPIs or by RS-422 using the VDCP protocol.

514-333-1772; www.miranda.com
Booth: N2515

DISPLAYS FOR 3-D PRODUCTION WORK
Tektronix



3D Difference Map Display can be used to detect disparity between the Left Eye and the Right Eye images during camera setup (alignment) of 3-D production or 3-D post production; Anaglyph Display allows users to identify parallax (3-D depth) of various objects within the 3-D video image; Checkerboard Display helps the user identify any differences in luminance levels, focus and various color characteristics between the Left Eye and the Right Eye images; for monitoring of depth of various objects within a 3-D image, a Disparity Grid can be overlaid over various 3-D picture displays.

800-833-9200; www.tek.com
Booth: N1929

TBCs, frame syncs, conversion equipment

SCAN CONVERTER
Ensemble Designs
BrightEye Mitto 1F

Brings YouTube, Skype, weather radar and viewer e-mails to video for on-air use; Macs, PCs, iPhones and iPads can all be used as video sources; features SD, HD and 3G optical out; audio input accepts either AES digital audio or analog audio; audio is embedded into the SDI outputs.

530-478-1830
www.ensembledesigns.com
Booth: N1323

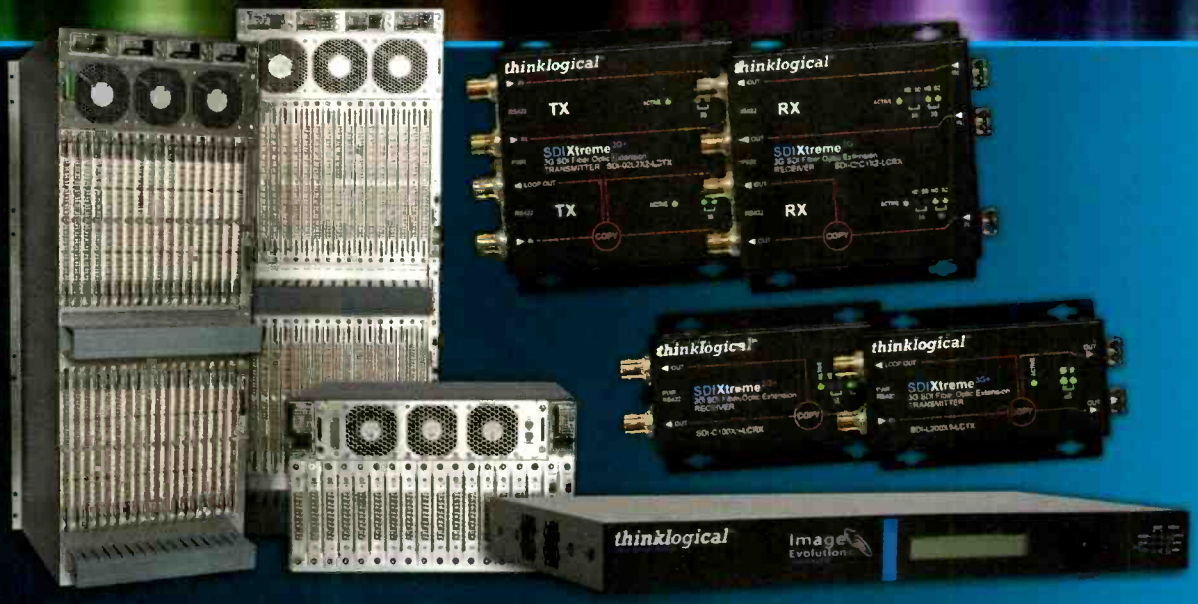
TIME CODE READER/GENERATOR
ESE HD-488

Reads and generates Linear Time Code (LTC) and RP-188; inserter mode provides the ability to superimpose time and/or user bits onto video with alphanumeric characters; video input and output are accessible via rear-mounted BNC connectors; time code input and output connectors on the rear panel are XLR.

310-322-2136; www.ese-web.com
Booth: C6437

THE GAME CHANGER

Revolutionary Infrastructure Solutions



Compact, broadcast quality, SDI over fiber extension systems
High performance non-blocking modular routers for complete, end-to-end routing of video and peripherals
Digital audio routing and extension

Providing Total System Solutions

- Control Rooms
- Edit Suites
- Studios
- Live Broadcast

UNLEASH THE BENEFITS

- Thinklogical's cutting edge technology eliminates pathological problems with standard SFPs
- Revolutionary router I/O card design functions as both an input and output card
- RS-422 ports for remote camera control
- The only fully redundant system architecture in the marketplace today
- Systems can accommodate both copper and fiber interfaces
- SMPTE Converter/Scaler – conversion from 3D to 2D, supports closed captioning and time code

Unrivalled Features, Unequalled Cost Performance

At Thinklogical, our business is built around knowledge - knowledge of your environments, knowledge of your systems... knowledge of your applications... knowledge of your industry. Our trained experts specialize in presenting solutions that save our customers time, money and improve their productivity and profitability.

Visit Us at NAB 2011 Booth SL10023

thinklogical™ www.thinklogical.com 800-291-3211

Color indicates advertisers

CONVERSION
Snell Alchemist Ph.C - HD

Features 1080p capability; empowers users to deliver content to any broadcast standard without compromising picture quality or clarity; new version 5.1 software release adds an enhanced Dolby E Authoring option to the system's existing Dolby E transcoding and decoding capabilities, thus supporting encoding with more comprehensive audio routing control.

212-481-2416; www.snellgroup.com
Booth: N1820

CONVERSION CARDS
Cobalt Digital Fusion3G

All Fusion3G cards now have Dolby transcoding and EAS audio ducking available; a Dolby E stream can be decoded to baseband (and channel-swapped or optionally loudness-processed) and then re-encoded into Dolby Digital or Digital Plus; for EAS audio ducking, input mixing allows the set up of ducked mixing 5.1 or stereo program audio and EAS audio; custom mixes can be saved on the card and then recalled using the card's GPI input; when a GPI trigger occurs, the card goes to the ducked mix, and when the trigger clears, normal routing is restored.

217-344-1243; www.cobaltdigital.com
Booth: N2512

SCAN CONVERTER
Matrox Convert DVI Plus

Creates broadcast video from computer applications such as Skype, YouTube, Google Earth, video games, and web browser sessions, as well as citizen journalists' mobile phone videos; DVI-D input up to 1920 x 1200; features HD/SD-SDI digital output; HD/SD analog component, S-video, and composite analog inputs; SD analog black burst (bilevel) or HD trilevel genlock with timing offset controls; simultaneous analog and digital video output; stereo audio input can be embedded into the SDI output signal; real-time hardware upscaling and downscaling with proper color space and aspect ratio conversion.

800-361-4903; www.matrox.com
Booth: SL2515

IMAGE PROCESSOR/CONVERTER
Thinklogical ImageEvolution X3

Equipped with full breadth of video-processing capabilities such as per-pixel motion-adaptive video noise reduction, content-adaptive block and mosquito noise reduction, natural depth expansion, and adaptive scaling; converts and scales SD, HD, dual-link HD and 3G; provides up to 20 user-programmable presets; includes support for eight channels of embedded audio and ancillary data; controllable via front-panel multifunction selector and LCD display or RS-232 port for remote control.

203-647-8725; www.thinklogical.com
Booth: SL10023

SIGNAL PROCESSING LINE
Snell IQ Modular 3G

Compact, highly integrated processing engine enables flexible signal handling and, in space-constrained applications, can serve as an advanced audio processing solution; also new is a range of fiber-optic interfacing modules that combine electrical-to-optical conversion with critical processing functions such as video synchronizing.

212-481-2416; www.snellgroup.com
Booth: N1820

SWITCHER
TV One C2-8000

Provides high-quality video switching with two-channel, bidirectional conversion between a variety of analog and digital video formats; standard system features multiple DVI-U input modules (allowing any of HDMI, DVI, Composite Video, YC, YUV, YPbPr or RGB) that can be scaled and switched between, along with two independent processing channels; can also fit 3G-SDI and audio I/O modules.

859-282-7303; www.tvone.com
Booth: C5647

Color indicates advertisers

Telco, IPTV, mobile video equipment

HD/SD H.264 ENCODER
DVEO HCoder ASI/IP

Designed for backhaul applications and ENG; features simultaneous GigE and dual DVB-ASI outputs and inputs that can be HDMI, SD/HD-SDI, component or CVBS; supports HDTV resolutions up to 1920 x 1080 x 30p, 60i/50i; includes LCD front-panel controls and remote management software; audio encoding is MPEG-1 Layer II, AAC or Dolby Digital pass through.

858-613-1818; www.dveo.com
Booth: SU6911

TRANSCODER
Sencore TXS 3453

Delivers multiple channels of best-in-class, high-performance, reliable transcoding and transrating in a high-density 1RU chassis; with a configurable engine and multichannel architecture, the transcoder can perform MPEG-2 to H.264 and H.264 to MPEG-2 SD and HD transcoding — as well as transrating of MPEG-2 or H.264 streams — cost-effectively; key features include ASI and MPEGoIP transport stream inputs and outputs, as well as the ability to compress the output to very low bit rates while maintaining excellent video quality to the end viewer.

605-335-6379; www.sencore.com
Booth: SU7213

VIDEO SYSTEM
Thomson Video Networks ViBE VS7000

Fully-integrated IP video solution for convergent applications such as Web TV and OTT services delivery, traditional IPTV, and IP/cable delivery; combines all major audio/video codecs, the latest adaptive streaming formats, and a resilient IT platform for native redundancy and scalability.

+33 2 99 27 30 30
www.thomson-networks.com
Booth: SU4917

METADATA PLATFORM
Triveni Digital GuideBuilder

Has been extended for mobile service support with new ESG functionality for program content, as well as for interstitials and channel logos; engineered in accordance with the new ATSC Mobile DTV A/153 Part 4 standard, this extension of the GuideBuilder's mobile capabilities ensures up-to-date scheduling and tuning, managed through the operator's existing workflow components; includes development of an open ESG carouselling interface for multiplexers, designed to support centralcasting applications.

609-716-3500; www.trivenidigital.com
Booth: SU3202

HD/SD H.264 ENCODER
Evertz 9782 ENC-H264HD

HD/SD 8-bit 4:2:0 H.264 video encoder; features HD/SD-SDI input with embedded audio, dual ASI outputs and dual IP outputs, three latency modes (normal, medium and low), bit rates of 4Mb/s to 80Mb/s, support for MP@L4, HP@L4, Hi422P@L4, noise reduction, and scene cut detection; optional are 8-bit 4:2:2 and 10-bit 4:2:2 H.264 encoding, as well as MPEG-2 and JPEG 2000 HD/SD encoding.

905-335-3700; www.evertz.com
Booth: N1602, SU9717

IPTV DISTRIBUTION
Intelsat IPTV Service

Wholesale MPEG-4 content aggregation and delivery service for distributors and integrators operating in the United States; supports delivery of a prepackaged TV programming lineup in a highly-efficient MPEG-4 IP format to cable and telecom service providers.

202-944-7515; www.intelsat.com
Booth: SU4310

Test & measurement equipment

DISTORTION ANALYSIS SOFTWARE
Rohde & Schwarz R&S FS-K130PC

Allows users to characterize and linearize amplifiers; compensates for memory effects exhibited by many of today's amplifiers; test setup consists of a spectrum analyzer, a signal generator and a PC; measures the amplifier's characteristics and calculates the correction required to attain a linear output signal.

410-910-7800; www.rohde-schwarz.com
Booth: SU3721

Color indicates advertisers

Color indicates advertisers

VIDEO MONITORING AND LOGGING
Volicon Observer

Captures, stores and indexes broadcast content from multiple channels, offering users simultaneous Web access to recorded video content from their desktop computers; includes the Observer Professional, Observer Enterprise and Observer Remote Program Monitor; three new additions are ASI/transport stream logging, loudness monitoring and AC-3/Dolby Digital decoding features.

781-221-7400; www.volicon.com
Booth: SU5902

BROADCAST MONITORS
PHABRIX Rx Series

Designed for environments such as central control booths, studio engineering panels and OB facilities; housed in a 19in 2U standard rack mount; can be configured with one or two modules; two 4.3in color TFT screens display the monitored signal at all times with separate measurement display for generation of patterns and analysis.

+44 163 5276302; www.phabrix.com
Booth: N325

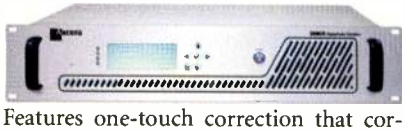
WAVEFORM MONITORS
Blackmagic Design UltraScope, Pocket UltraScope

Version 1.5 update adds new video gamut and audio error logging, as well as customizable profiles so different post-production houses and broadcasters can define their own operation standards for quality control; error logging features automatically check and log all RGB gamut, luminance and chroma video levels, and audio levels; custom profiles allow specific settings for generating errors based on various types of video level products, and all errors can be saved to a simple log file with timecode and time of day.

978-337-0991
www.blackmagic-design.com
Booth: SL220

TV transmitters, feedline, antennas, towers, services

EXCITER
Axcera DM8C-R



Features one-touch correction that corrects distortions at the touch of a button with the option of having full adaptive correction (AXACT); supports ATSC and ATSC Mobile DTV; can be used to upgrade or retrofit an existing digital transmitter, regardless of manufacturer.

800-215-2614; www.axcera.com
Booth: SU2908

FIBER-OPTIC TRANSMITTER/ RECEIVER

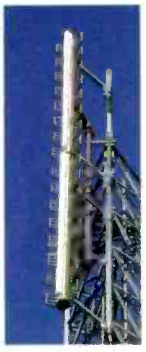
Extron Electronics FOXBOX HDMI

Uses digital, zero-compression technology to deliver pixel-for-pixel transmission of HDMI computer-video images up to WUXGA 1920 x 1200 resolution, including HDTV 1080p/60; available in single- and multimode models; includes Key Minder, EDID Minder, auto input memory, RS-232 control from multiple locations, internal test patterns and real-time system monitoring.

714-491-1500; www.extron.com
Booth: SL10920

ANTENNA

Jampro Antennas Prostar JA/MS-BB



Compact antenna conserves tower space and minimizes wind loading; designed for multichannel/combined channel operations in analog-analog, analog-digital or digital-digital TV applications; can be configured for horizontal, circular or elliptical polarization; beam tilt and null fill are available; handles power ranging from 2kW to 10kW; input impedance is 50V and VSWR of 1.1:1 or better can be achieved over sub-bands ranging from 470MHz to 530MHz to 835MHz to 890MHz.

916-383-1177; www.jampro.com
Booth: C2307

TRANSMITTER

Screen Service Broadcasting Technologies SDT Ark 6 Series

Can be used as a transmitter, a heterodyne transposer, a regenerative transmitter and single-frequency echo canceller; implements DVB-T/T2, PAL, ATSC/MH, NTSC and ISDB-T modulations; allows selection of transmission modes in various ways: remotely, using a dry contact, via SNMP commands, via TCP/IP using the Web graphic interface, or even via a dedicated command inserted into the transport stream.

888-522-0012; www.screenservice.net
Booths: SU6321, OE1371

TRANSMITTER SERIES

Thomson Broadcast Elite

Now supports the ISDB-Tb system; a real-time Digital Adaptive Pre-correction feature is designed to offer excellent stability and quality of the signal, regardless of variations in typical environmental conditions; also included are an embedded SNMP agent and a Web server.

413-998-1100; www.thomson-broadcast.com
Booth: SU4917

Color indicates advertisers

Color indicates advertisers

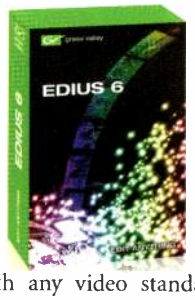
Video editing systems

NONLINEAR EDITOR
Avid Media Composer 5.5

Works with practically any media format; captures, monitors and outputs with AJA Io Express; edits HDCAM SR Lite footage natively; accelerates AVC-Intra workflows with Nitris DX AVC-Intra; features better search capabilities and finds video clips based on a spoken word or phrase.

978-640-6789; www.avid.com
Booth: SU902

NONLINEAR EDITOR
Grass Valley EDIUS 6



Works with any video standard up to 1080p50/60 or 4K digital cinema resolution; all major codecs in use in the industry are supported natively, with no transcoding required even when different compression formats are mixed on the timeline; users are able to preview effects in real time; features include 10-bit editing support, 2K/4K resolution support, free-shape mask filter, 16-camera multicam editing, proxy mode workflow, Canon XF format and EOS movie format support, as well as exporting in AVCHD format to a media card.

503-526-8100; www.grassvalley.com
Booth: SL106

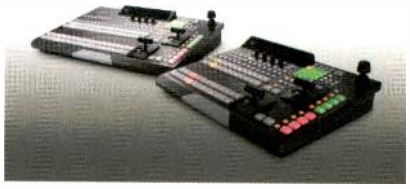
COLOR CORRECTION SYSTEM
Blackmagic Design
DaVinci Resolve 7.1

Adds clustered multi-GPU processing to Mac OS X systems; features improved support for Tangent Wave control panels, support for the JL Cooper Eclipse CX control panel, and new file formats and codecs, including support for Arri Alexa ARRIRAW, Phantom Cine, high dynamic range OpenEXR and more.

978-337-0991
www.blackmagic-design.com
Booth: SL220

Video routing

VIDEO SWITCHER INTERFACE
FOR-A HVS-350HS Mira interface



Interface enables the HVS-350HS HD/SD digital video switcher to control the Abekas Mira production server; users can review a list of clips, set in/out points and control clip playback from up to four independent video channels through the switcher's HVS-350U control panel or HVS-35GUI remote-control software.

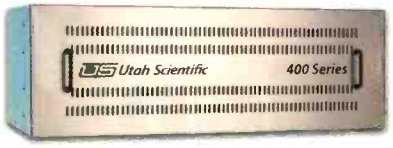
714-894-3311; www.for-a.com
Booth: C5219

ROUTER CONTROL PANELS
Harris Magellan

Deliver a fast and user-friendly way to control both Harris and third-party systems; available as a series of 10 programmable hardware panel types in both 1RU and 2RU versions; template-driven panels provide intuitive, Web-based configuration for a quick setup in both local and remote operations; compact Magellan family enables users to optimize router navigation and control.

800-231-9673
www.broadcast.harris.com
Booth: N2502

MULTIVIEWER OPTION
Utah Scientific UTAH-400/MV



New for the UTAH-400 series of routers; integrates seamlessly with the router control system; does not require the use of dedicated router ports for monitoring; offers multiple outputs that allow the user to control the number of pictures to be displayed on each screen; built-in cable extenders are included for easy installation; outputs can be formatted in DVI, HDMI or HD-SDI.

801-575-8801; www.utahscientific.com
Booth: N4511

Note: Booth numbers are provided by NAB and are current as of press time. Every effort has been made by Broadcast Engineering *to ensure the accuracy of these listings.*

Wire, cable, connectors

1023 DIN CONNECTOR
White Sands Engineering/TVC 1.0/2.3FPB90

One-piece, right-angle 1023 DIN connector for mini RG59 cable; for installations that require cable to be routed 90 degrees from the connector interface; designed to save space and eliminate the problems caused by too tight a bend radius in the cable; compatible with 23 AWG precision video cables, including YR46940, 1855A and VDM230.

623-581-0331; www.whitesandsengineering.com
Booth: SU9417

CONNECTORS
Fischer Connectors UltiMate Original Series

Includes four mechanical codings and visual coding to prevent misconnection; push-pull connector is available in a wide range of body styles, sizes and configurations, including multipole contacts from two to 42 poles; withstand temperature fluctuations from -55°C to 135°C.

678-393-5400
www.fischerconnectors.com
Booth: C10948

PRETERMINATED WIRE ASSEMBLY
Optical Cable Corporation QuadBox

Preterminated four-channel systems uses Keystone outlet jacks and bundled four-pair cable; options include Cat 5e, 6, and 6a, allowing multiple protocol options from 10Mb/s to 10Gb/s; each jack is available in unshielded and shielded versions; each cable option is available in CMR and CMP.

540-265-0690; www.occfiber.com
Booth: C10345

Color indicates advertisers

PART 2

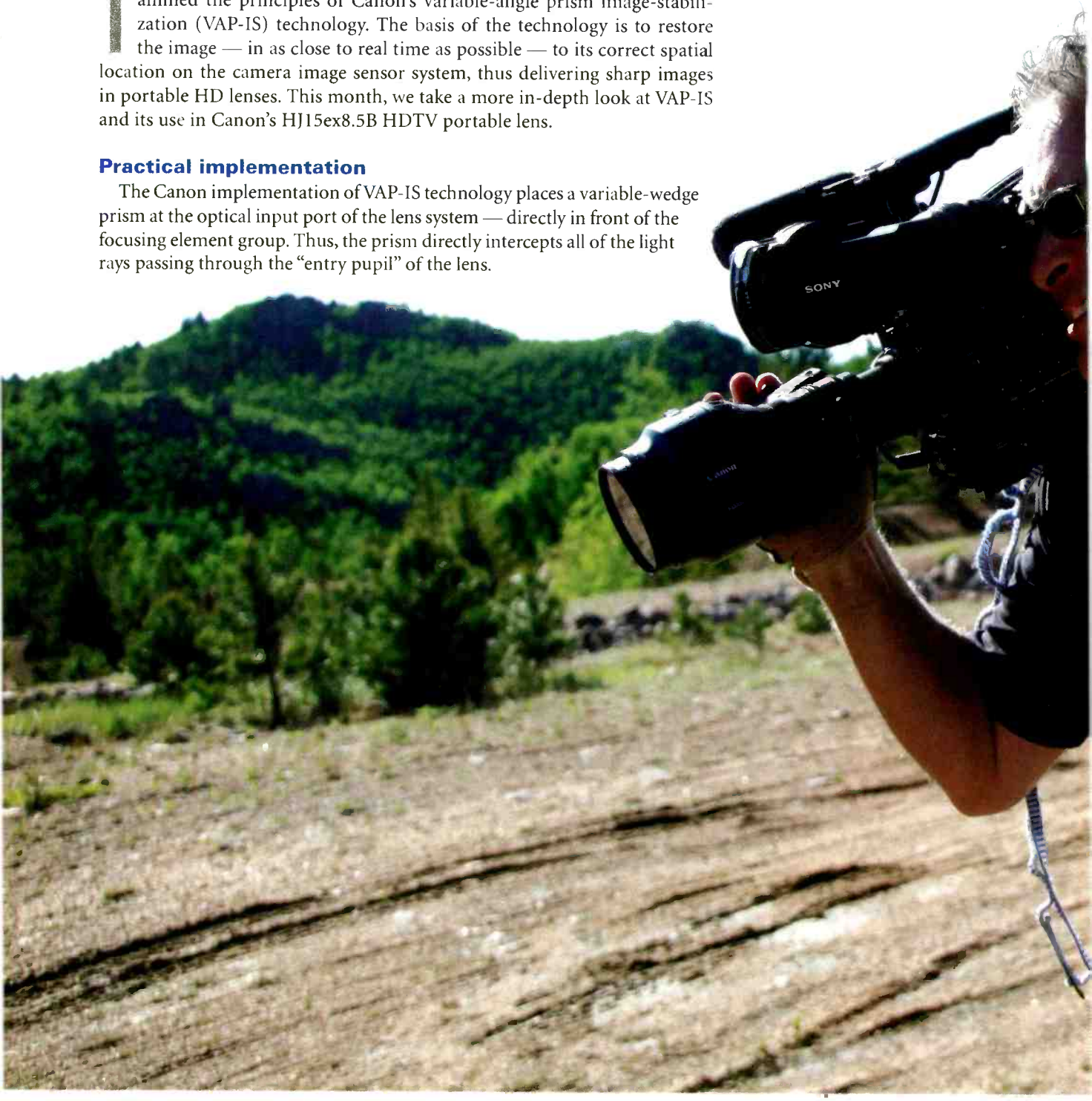
Camera lens image stabilization

BY LARRY THORPE

In last month's "Camera lens image stabilization: Part 1" article, we examined the principles of Canon's variable-angle prism image-stabilization (VAP-IS) technology. The basis of the technology is to restore the image — in as close to real time as possible — to its correct spatial location on the camera image sensor system, thus delivering sharp images in portable HD lenses. This month, we take a more in-depth look at VAP-IS and its use in Canon's HJ15ex8.5B HDTV portable lens.

Practical implementation

The Canon implementation of VAP-IS technology places a variable-wedge prism at the optical input port of the lens system — directly in front of the focusing element group. Thus, the prism directly intercepts all of the light rays passing through the "entry pupil" of the lens.



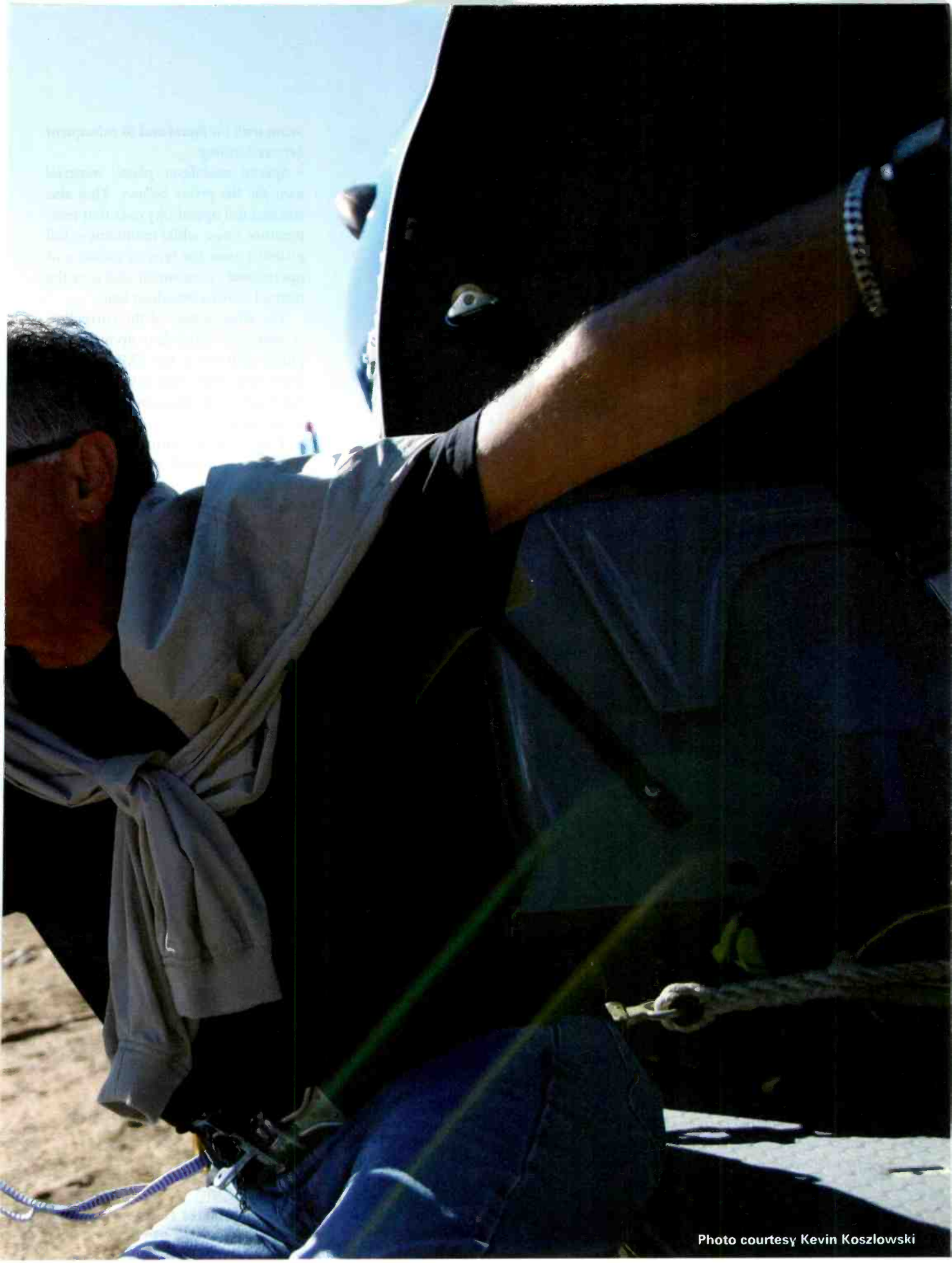


Photo courtesy Kevin Koszlowski

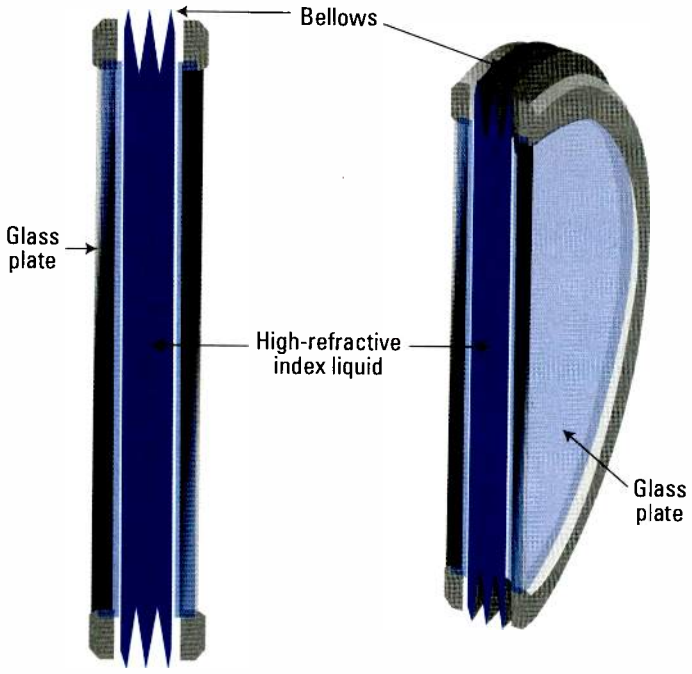


Figure 1. Two views of the VAP-IS system

Figure 1 shows a simplified rendition of the construction of the VAP-IS system. Three key attributes constitute the heart of the prism being made variable in two dimensions:

- Two pieces of precisely flat circular glass joined by a flexible bellows
- A high refractive index liquid that is hermetically sealed within the enclosure
- The two rigid circular frames supporting the flexible bellows

Two mechanical actuating systems grip the VAP-IS circular metal support, and they, in turn, are controlled by fast-acting yaw and pitch actuators. This provides the appropriate squeezing of the prism in the horizontal and vertical direction that implements the requisite prism angle. See Figure 2.

A special wedge-shaped coil having an armature that pivots will rotate the VAP-IS's supporting mechanical unit.

Technology of the vari-angle prism

Key technologies in the VAP-IS system are:

- *The special liquid hermetically sealed within the enclosure having the requisite high-refractive index.* It maintains that optical functionality over a broad lens operating temperature range of -22° F to +176° F.
- *A proprietary means of filling the prism with the liquid and its subsequent hermetic sealing.*
- *Special multilayer plastic material used for the prism bellows.* This also sustains full operability over that temperature range while maintaining full pliability over the tens of millions of operational cycles anticipated over the normal life of a broadcast lens.

The effectiveness of the correction is obviously dependent upon the rapidity with which the VAP-IS system intercepts and redirects incoming light rays. Real-time control is the ultimate goal.

Three core miniature components inside the lens itself are central to the control system:

- *Motion/vibration sensors*
- *Rotary actuators.* Rotary actuators that physically manipulate the variable-angle prism are a magneto-electrical-mechanical system. They use miniature Voice Coil Motor (VCM) technology. These are direct-drive devices based on current-carrying coil windings lying within a permanent magnet field that produces a physical force that is directly proportional to the applied current. The consequent movement of the coil drives the two actuators that squeeze the prism either horizontally, vertically or both — depending upon the microcomputer

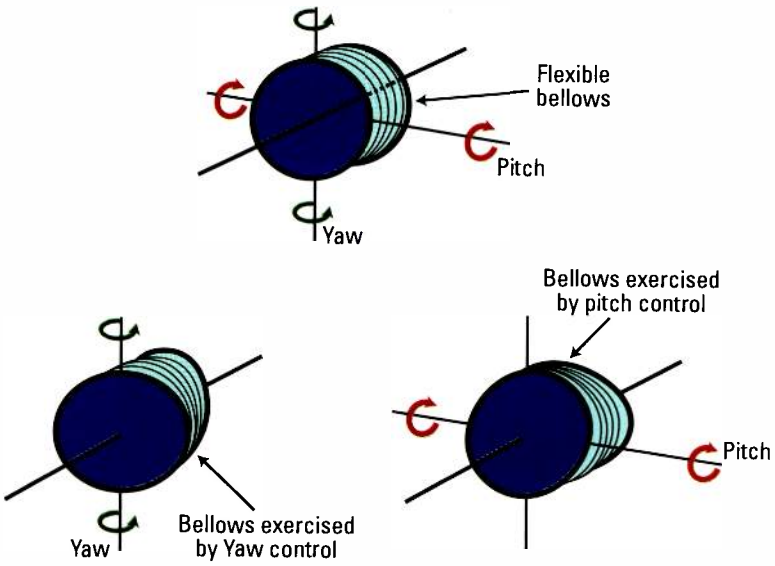


Figure 2. The top portion shows the VAP-IS system when stable. The lower drawings illustrate the dynamics of the system, with the flexible bellows being squeezed in both H and V directions.


WORKFLOW
OVER IP
QTube shrinks the world.
With QTube global media workflow you can:
Edit content located anywhere.
From anywhere.
Over the internet.
Find out how QTube can revolutionize your world
quantel.com/qtube or see it at NAB booth #SL2014
QTube
Workflow over IP
Quantel

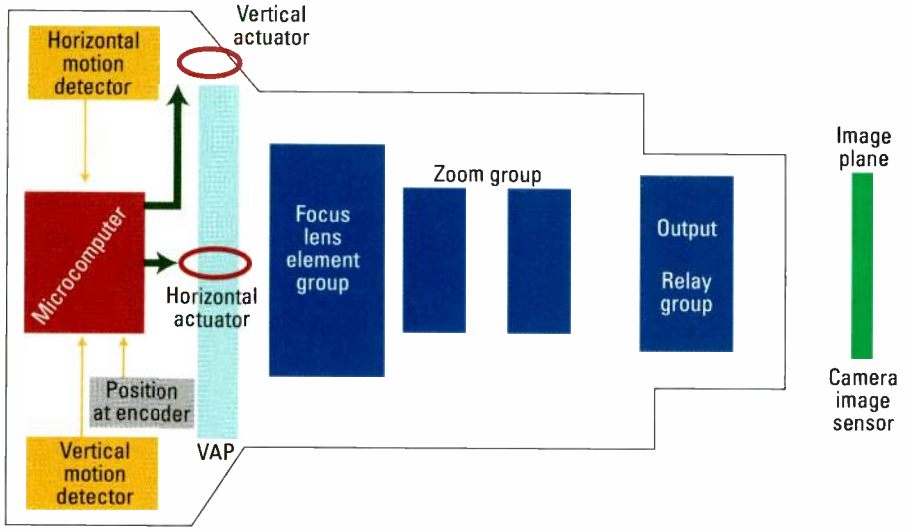


Figure 3. This simplistic rendition illustrates the feedback control loop that squeezes the VAP-IS system in two dimensions (horizontal and vertical). The physical actuators that flex the VAP-IS are indicated by the simple coil symbol.

control decisions.

- *Microcomputer and associated specialized algorithms*

Control loop for the VAP-IS system

Figure 3 shows a simplified representation of the stabilization control loop. Two motion detectors — one for horizontal movement and a second for vertical movements — are positioned within the body of the lens. Their electronic outputs are fed to the system microcomputer, where appropriate lens-motion analysis is made. The microcomputer computes a correcting control signal. That signal feeds driver circuits that in turn manipulate two actuator systems that physically alter the variable wedge prism in either a horizontal or vertical direction, or one that combines both. These actuators employ VCM technology.

The position sensor that monitors the prism movement sends feedback signals to the microcomputer, thus closing a feedback loop having high speed and a high degree of precision.

Technology of the VCM actuator

The coil is mounted on a nonmagnetic arm and is free to move within the surrounding magnetic housing. A special wedge-shaped coil having an armature that pivots will rotate the VAP-IS's supporting mechanical unit. One VCM applies yaw rotation, and the second applies pitch rotation. When the direction of the current is switched, the direction of the coil's movement will also change. Using a coil of low inductance, this makes possible cycle times that are typically an order of magnitude faster than solenoid devices. This is essential to dealing with lens vibrational disturbances.

The key advantages of this VCM control are:

- *Higher force compared to stepper or servomotor systems*
- *Higher acceleration rates than stepper or servomotors*
- *Direct drive.* The absence of gears and cogs precludes backlash issue.
- *Zero hysteresis.* This is advantageous when rapid change in direction is required.
- *Low acoustic noise*
- *Low heat generation.* What little heat is produced is a factor of the resistance of the coil and a small amount due to friction.

A central part of the control loop design was development of a very fast-acting system for flexing the VAP-IS system. The principles of the mechanical actuators that do this are shown in Figure 4.

A central part of the control loop design was development of a very fast-acting system for flexing the VAP-IS system.

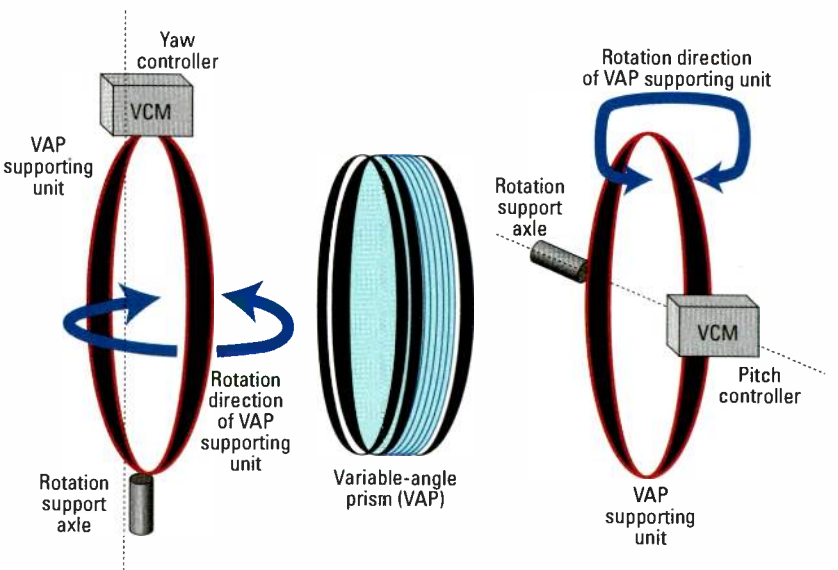


Figure 4. An exploded view of the two circular mechanical support units that grip the variable-angle prism and apply yaw and pitch rotations under control of the VCMs

fischer UltiMate™

UltiMate Connections for Harsh Environment

New Original Series

- **Rugged** design for **harsh environment**
- Excellent sealing **IP68/69K** even unmated
- Extremely **robust** mechanical keying
- **Miniature** and **ultralight** design
- High pin density
- High shock and vibration resistance
- Operating temperature: -55°C to +135°C
- Push-pull locking system
- Easy Fischer **cable assembly solutions**

Visit us at NAB Booth N°C10948

www.fischerconnectors.com

Fischer Connectors, Inc.
1735 Founders Parkway
Alpharetta, GA 30009
Tel: 800.551.0121
Fax: 678.393.5401
mail@fischerconnectors.com

fischer CONNECTORS

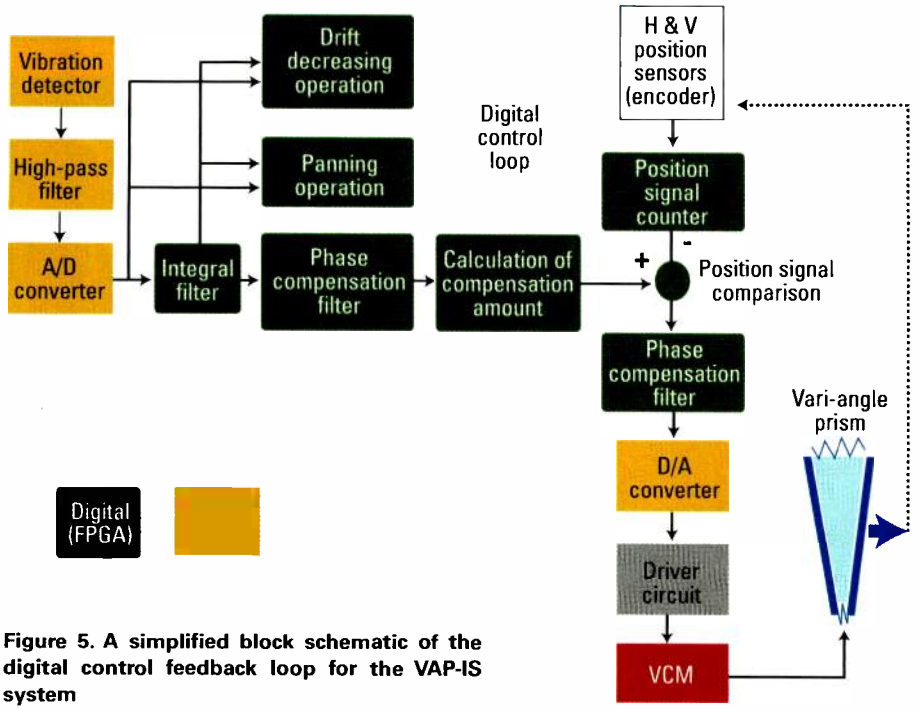


Figure 5. A simplified block schematic of the digital control feedback loop for the VAP-IS system

Digital feedback control loop

When Canon developed the first broadcast standard-definition portable lenses with VAP-IS in the mid-1990s, it employed a sophisticated analog feedback control loop. This worked well. Over the next decade, digital and microcomputer technologies advanced that facilitated the development of a far more sophisticated all-digital feedback control system for the new HJ15ex8.5B high-definition lens. The basics of this digital control system are outlined in Figure 5. This digital feedback control loop achieves a 20-fold increase in correction speed over that of its analog predecessor.

The level of correction is in the neighborhood of 100:1.

Performance achieved

Figure 6 shows the measured performance achieved within the HJ15ex8.5B portable lens. This graph assumes physical disturbances (jolts, hand tremors or vibrations) that, uncorrected, would produce an image shift that is normalized to 100 percent. The plotted curve represents measured residual image shift following VAP-IS correction. As illustrated, over most of the frequency range, the level of correction is in the neighborhood of 100:1.

The frequency range shown encompasses handheld and shoulder-mount operations with the camera operator walking or running (generally in the 1Hz to 4Hz range), tripod mounted on an unstable platforms or under high-wind conditions (typically in the 3Hz to 6Hz region), and shooting from a car, motorcycle pillion seat, helicopter or boat (typically 5Hz to 12Hz).

Summary

The HJ15ex8.5B is the first HDTV portable production lens having a built-in optical stabilization based upon Canon's VAP-IS technology. It is a compact lens weighing only 4.4lbs. Advances on a number of core technological fronts have steered various refinements, producing a fast-acting and precision control feedback loop for a novel optical stabilization technology. BE

Larry Thorpe is the national marketing executive of the broadcast and communications division of Canon.

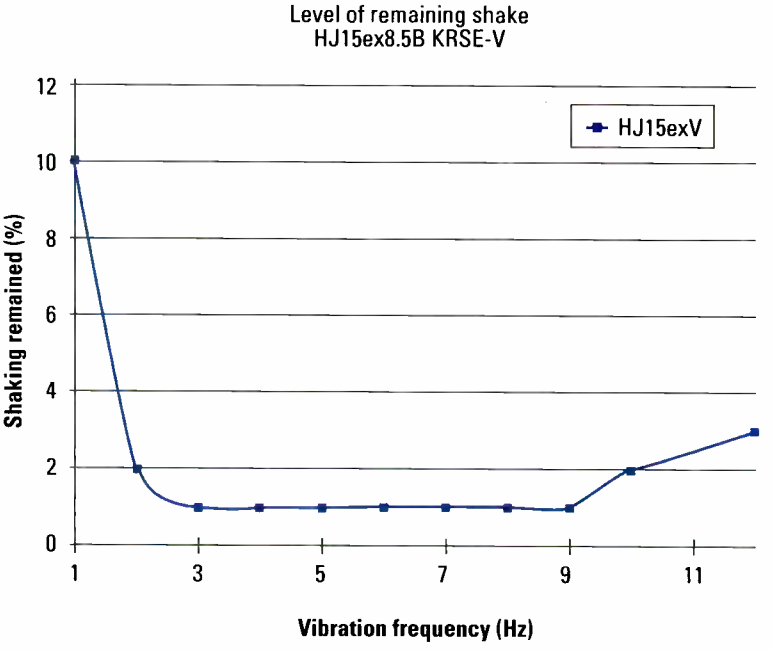


Figure 6. Assuming a 100-percent image displacement due to physical disturbances to the lens, the curve shows the remaining percentage of image disturbance with the VAP-IS system engaged.

Acuitas®

The future is here.

Acuitas is the cost effective, IT-based, off-the-shelf, video server solution that provides reliable and affordable High-definition playout, graphics, effects, conversion and frame-accurate switching within the box. Build an entire TV station for a quarter of the cost without the constraints of traditional infrastructures or tedious workflows. Acuitas can be utilized for stand-alone mobile solutions or employed at large multi-channel facilities or deployed at everything in between. Find the best commodity server technology from the proven leaders of TV Automation technology: Florical, of course.

FLORICAL SYSTEMS

1.800.372.4613 FLORICAL.COM

Evertz Media Server

The system overcomes the workflow and storage limitations of traditional SAN-based servers.

BY JOHN L. PITTAS

In the past 15 years, numerous media server products have come and gone in the broadcast market. First-generation products were standalone chassis with integrated A/V I/O and Direct Attached Storage (DAS), which function well for a small number of I/O channels and when the content does not need to be shared.

Second-generation products separated the A/V I/O and storage, thereby enabling higher I/O channel counts. They typically used a Fiber Channel-based SAN to build larger, shared storage servers. These systems provided high-performance but required proprietary client access to the content, creating an "island of storage" that was not easily accessible to third-party applications. This storage access problem led to the deployment of multiple SANs, thereby creating islands of storage that had to be separately administered, maintained and serviced.

In parallel, the increased growth of file-based workflows in the broadcast enterprise labored against the islands-of-storage approach of application-specific SANs. Many resources were expended in creating logical and physical gateways between SANs and then in managing the movement of content between them. Furthermore, many applications require specific data structures (A/V codecs and multiplexes) to assure interoperability, thereby adding yet another layer of logical or physical resources to transform the data into a format that the applications can use. All these gateways, transcoders and data-movers add time, cost and inefficiencies to a file-based workflow that was originally promised to be faster, simpler and more integrated than a tape-based sneaker-net.

To overcome the workflow and storage deficiencies of managing multiple SANs, Evertz has introduced the third generation in media server architectures. Evertz Media Server (EMS) is based on a robust, field-proven client/server architecture that overcomes the workflow and storage limitations of traditional SAN-based

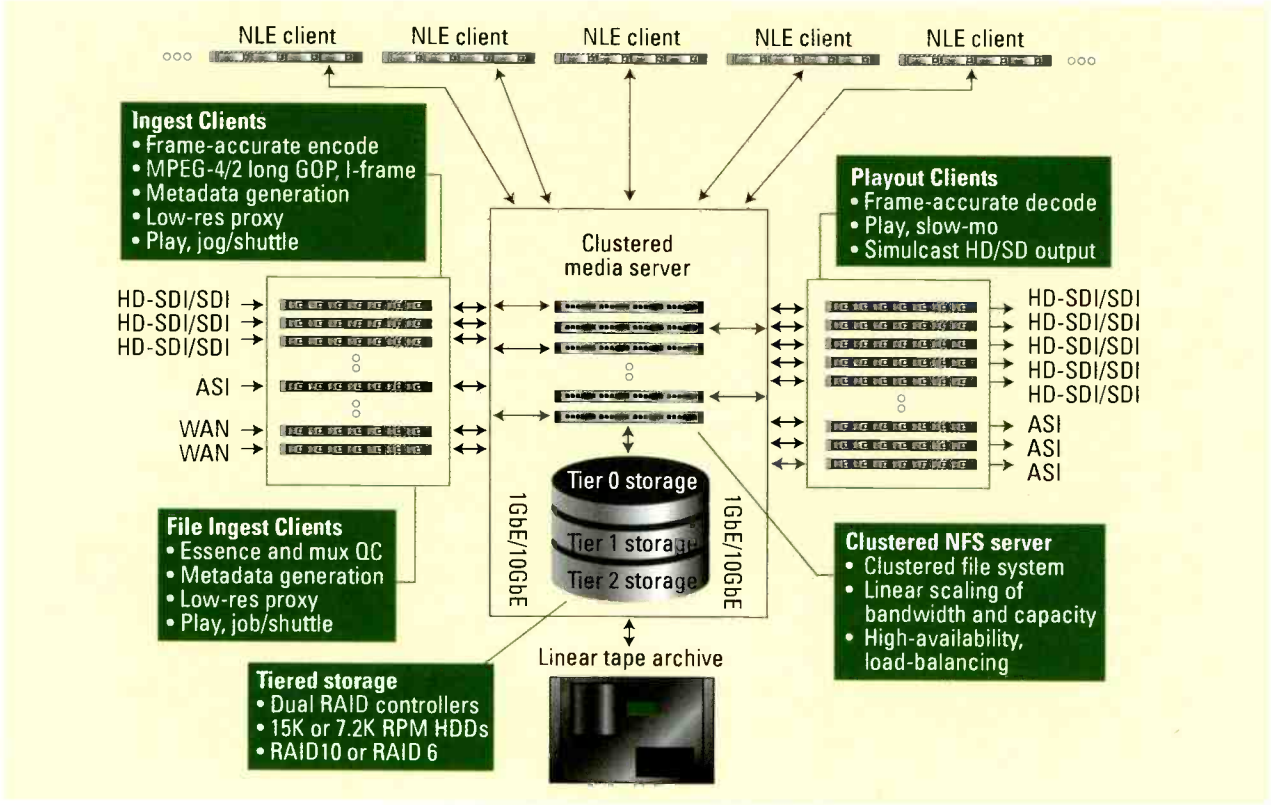


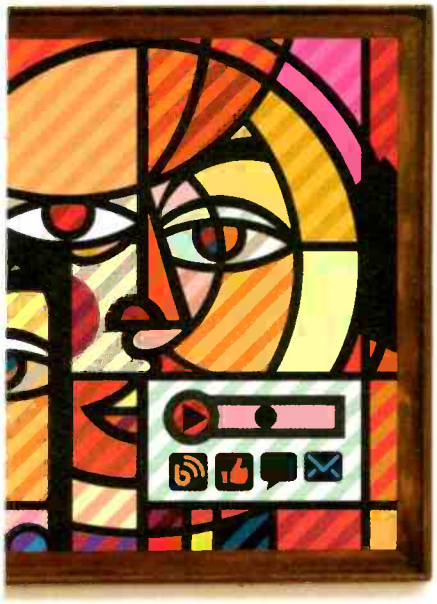
Figure 1. The Evertz Media Server can scale from two to 16 nodes using a clustered NFS server. The result is scalable, high-performance file-serving to attached application clients.

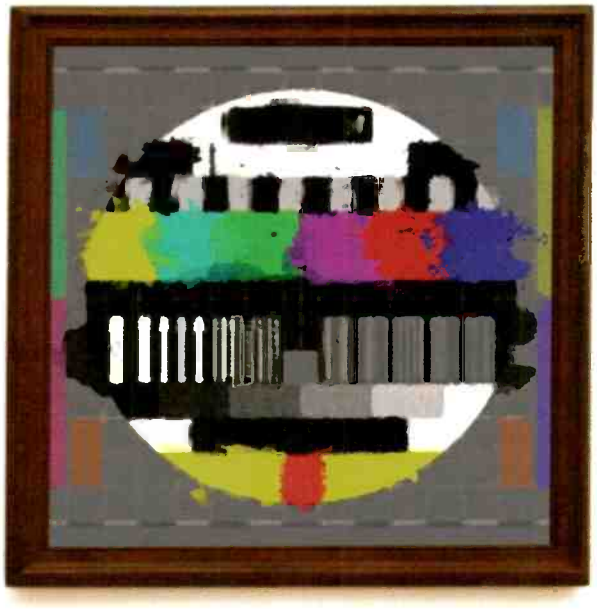
THE ART OF INTEGRATION

PICTURE THE POSSIBILITIES

The seamless distribution of content produced to inform and entertain audiences around the corner — or across the globe — in any number of formats. This is the art of integration.

Experience the gallery of innovation that is the NAB Show™ and let your next masterpiece take shape. Here you'll find the technologies leading broadcast engineering for 3D, HD and DTV, and the newest tools enabling automation systems, workflow and asset management solutions needed to stay competitive and drive business forward. **Learn more and register today at www.nabshow.com.**





FREE
Exhibits Only Pass
USE CODE PA06.

NAB SHOW™
Where Content Comes to Life™

Conferences April 9-14, 2011 • Exhibits April 11-14
Las Vegas Convention Center • Las Vegas, Nevada USA

Visit the NAB Show online gallery to view the entire collection of Integration-inspired paintings.

www.nabshow.com

Get a free code reader at getscanlife.com.

servers while also providing high performance. This next-generation architecture provides the scalability, flexibility and reliability to match the requirements of broadcasters, whether they are single-channel local originators or national and transnational content providers that deliver hundreds of HD channels.

Fault-resilient core storage

The core of the system is the Media Server, a clustered NFS server that provides scalable, high-performance file-serving to attached application clients. The server cluster can scale from two to 16 nodes. Each node has two 10Gb/s Ethernet ports connected to a pair of redundant 10G to 1Gb/s switches on the client-side IP network. Each node can provide a minimum of 500MB/s of combined read/write bandwidth to the IP network.

All clients attach to the server cluster via IP using NFS file access protocols. Client network connections are typically dual 1Gb/s Ethernet ports for read/write of compressed content. For high-performance live, sports or post-production environments, dual 10Gb/s Ethernet ports can be installed in the clients to support read/write of uncompressed HD and even 3Gb/s content.

The cluster provides N-1 hi-availability and load balancing. Hi-availability assures that the failure of any single node in the cluster will not take the server offline, while load balancing avoids performance bottlenecks in the cluster.

Furthermore, for client operating systems that support active-active IP port-bonding, the Media Server OS assures that no Single-Point-of-Failure (SPoF) in the client-side network will interrupt file read/write. This capability operates independently of the client application, thereby freeing the application of knowing and recovering from a SPoF event in the IP network.

The sole purpose of the Media Server is file-serving. No A/V I/O or processing is performed on it.

On the storage side, each node has two 8Gb/s Fiber Channel (FC) ports connected to a pair of redundant 8Gb/s switches on the storage-side FC network. The storage sub-system is actually composed of a collection of SANs. This means that one or more Storage Controllers (SC), and their SAS-attached Storage Expansion (SE) chassis, can be connected to the FC network to provide high-bandwidth, high-capacity or both.

Because this collection-of-SANs can be organized as one or more independent SANs, they can be composed of differing storage technologies. Therefore, some SCs and SEs can contain 15K RPM drives, and others can use 7.2K RPM drives.

The EMS system allows combining multiple storage tiers in one physical machine. For example, high-performance Tier 0 storage using RAID10 15K RPM drives for live production can be supplemented with a Tier 1 composed of RAID6 15K RPM drives for online performance, both of which are supplemented with a high-capacity Tier 2 near-line archive composed of RAID6 7.2K RPM HDDs.

The storage-side FC network also supports active-active multipathing. This not only provides each node with two paths to each SC, but also it enables data to travel across both paths for all reads and writes. Active-active multipathing assures that there are no latent double-faults that could take data offline as are inherent in active-passive arrangements.

Media Clients

The sole purpose of the Media Server is file-serving. No A/V I/O or processing is performed on it. All A/V I/O and content processing is performed by hardware or software applications running on the attached clients. These clients can be either

HW/SW platforms from third-party vendors or highly-optimized Evertz Media Clients.

The Ingest Client is a broadcast-quality, frame-accurate ingest station that performs real-time software encoding and multiplexing of HD/SD-SDI in either MPEG-2 or MPEG-4 formats. Currently supported HD codecs include XDCAM HD 4:2:2 and AVC-Intra 100. Plans for future codecs include JPEG 2000, as well as mezzanine-level HD 4:2:2 codecs used by popular NLEs. Each Ingest Client also supports a confidence playback output (with a minimal delay), as well as a full jog/shuttle/play output. This mode can be used to review the content as it's being ingested, or as a general-purpose output for any stored content.

While encoding, content-based metadata is generated, as are MPEG-4 based low-resolution proxies. An advanced metadata schema provides hooks for supplemental data structures such as multiple closed captions and an unlimited number of audio language tracks.

The Playout Client provides multichannel, linear, frame-accurate content decode and playout, plus real-time SD/HD up/down and HD-crossconversion. This allows an output channel to be assigned a particular raster format. Subsequently, all content played on that channel will be automatically and frame-accurately converted to the designated output raster, no matter the raster, codec or multiplex format of the original content.

The EMS provides next-generation features and capabilities that stem largely from a simple and robust client/server architecture.

File Ingest

To radically accelerate file-based workflows, Evertz introduced the File Ingest Client, which supports faster than real-time ingest of file-based content. When coupled with the Playout Client, content can be played in its multiplex and A/V codec format using the advanced metadata generated by the File Ingest Client. Evertz refers to this new feature as NativPlay. NativPlay effectively eliminates the need for transcoding, transrating and remuxing of content in order for it to play on the Playout Client.

Integrated solution

The EMS provides next-generation features and capabilities that stem largely from a simple and robust client/server architecture. The architecture contains the scalability, flexibility and fault resiliency to enable multiple operational models and host multiple applications using only a few functional components.

Production houses, broadcast operators and content delivery providers can now build a core server infrastructure that provides high-performance, as well as supports open standards. This represents a significant evolution in media server architecture, one that simultaneously realizes a more integrated facility as it exploits the inexorable price/performance advances of commodity IT components. BE

John L. Pittas is senior director - product development, Evertz Microsystems.

VYCON VDC

The backup flywheel power system keeps Alabama Public TV operations on-air during hurricanes.

BY WINDELL WOOD

Keeping Alabama Public Television's (ABT) sensitive digital production and transmitting systems up and running during the unpredictable storms we experience here in Alabama is a constant challenge, as Hurricane Katrina demonstrated. As a publicly funded station, we also have the responsibility to broadcast emergencies, so we take extra precautions to assure that our transmitter and associated electronic systems are up and running, despite the state of the incoming electricity.

In our Dozier, AL, facility, our transmitter is a solid-state Harris Platinum 4kW VHF. We have five, two-way repeaters and a 1kW NOAA weather transmitter. Our facility also has 20 tons of air conditioning, so keeping all these systems up and running is always my top priority.

In looking at our power protection solution, we wanted to make sure that the systems we put in place would have enough power backup with the highest reliability available. In my research, I contacted several other broadcast engineers to see what they were doing for power backup. They confirmed my concern about uninterruptible power systems' (UPSs) dependence on lead acid-batteries; you never know if you have enough battery capacity, and the charge state of the batteries is always in question.

According to the Electric Power Research Institute (EPRI), "Batteries are the primary field failure problem with UPS systems." Predicting when one battery in a string of dozens will fail is next to impossible, even with regular testing and frequent individual battery replacements. Batteries have a limited number of discharge cycles they can provide during their expected life. I found out through my research that every time the batteries are used (cycled), even for a split second, the more likely it is they will fail the next time they are called upon. Even testing the batteries shortens battery life, and just one cell in a battery string can render the entire battery bank useless.

The slim footprint of the VDC flywheel is easy to pair with three-phase UPS systems.

Seamless backup power

This information led to our decision to pair up a 160kVA three-phase UPS with a 215kW flywheel system — instead of using batteries — that could provide a reliable "ride-through to generator" function. We chose a VYCON VDC flywheel system that is fully compatible with UPS of leading manufacturers.

Operating as a mechanical battery, the flywheel stores kinetic energy in a rotating mass and converts it back into electrical energy when backup power is needed to support critical loads. The flywheel system provides ride-through time to bridge over to the generator for continued power during long-term grid-power outages.

During a power event — usually attributed to our local storms — the flywheel provides backup power seamlessly and instantaneously to our transmission equipment. If the power outage is longer than a couple of minutes, the flywheel will automatically and gracefully hand off to our backup engine-generator. It's important to note that according to the EPRI, 80 percent of all utility power anomalies/disturbances last less than two seconds, and 98 percent last less than 10 seconds. In the real world, the flywheel energy storage system has plenty of time — up to a couple of minutes — to gracefully hand-off to the broadcast facility's generator.

Since we installed the three-phase UPS along with the flywheel, we have been completely protected against power outages, which we experience here about twice a month. The flywheel system has operated flawlessly, and we're saving considerable money and resources by using a flywheel that requires no bearing replacement and has a 20-year life.

We also needed a system that could accommodate a 208V output. Other flywheel systems we looked at have a 480V output, which wouldn't fit our needs. The VYCON VDC has a 480/208 voltage configuration, which was perfect for us. This technology will not only give us the uptime we require, but also will save ABT money by providing clean, reliable power for 15 to 20 years compared to the typical battery-driven technology life cycle of three to four years.

We're ready for the next power outage. It's not a matter of if — just when. BE

Windell Wood is director of engineering for Alabama Public Television.

BroadcastEngineering®
SPECIALIZED TRAINING: Tutorial

GIVE YOUR EMPLOYEES THE TRAINING THEY NEED TO CLIMB THE LADDER OF SUCCESS!

Does your staff need training on the latest technology? Can't afford to send them to expensive seminars? *Broadcast Engineering*'s Specialized Training Corporate Subscriptions provide the solution!

Broadcast Engineering has assembled key and knowledgeable instructors to prepare video, broadcast, satellite, engineering and operational tutorials for station and production staff. Get access to the full catalog with a corporate subscription.

BENEFITS OF A CORPORATE SUBSCRIPTION:

- Provides low cost training
- Ensures a standard basic level of training for all employees
- Provides a refresher course to current staff
- Helps employees keep pace with the times and technology
- Use the courses to prepare key staff for promotions
- Authors are industry-specific experts
- Material helps prepare for SBE certification

For a complete catalog of current courses, or more information on purchasing your corporate subscription, please contact:
Julie Dahlstrom at 312-840-8436 or julie.dahlstrom@penton.com

TRAINING DOESN'T COST, IT PAYS!

Powered by
Zeus™
BROADCAST
An Obor Digital Company

Facility monitoring

ABC Television sets a high bar with its new central routing and switching system.

BY JOHN LUFF

I spent an interesting afternoon in New York recently looking at the new central routing and switching system at ABC Television (Central Switching Center). One could spend a lot of time reviewing the details of how the facility created a unique architecture capable of operating at beyond 3GHz, but for this rumination on technology, I want to focus on the control and monitoring aspect of the system, which went live a few months ago.

One of the interesting aspects of ABC Television's new central routing and switching system is that it incorporates technology from a number of vendors.

Routing control system

One of the interesting aspects of the facility is that it incorporates technology from a number of vendors. The routing control system was chosen independently of the routers. There is more than one router because the facility chose to use a "path-finding" approach, with a central switch receiving signals from an input router, and feeding output routers for plant distribution and monitoring. The plant being replaced was approximately 3000 x 2500 in total. Considering the size of the plant, a single monolithic router would have to be enormous, probably in the range of 4000-squared.

The cost of a router goes up roughly in proportion to the product of inputs multiplied by outputs. For the sake of argument, let's say a 100 x 100 router costs $50,000. (It doesn't.) That amounts to about $5 per port. If that is a valid measure, a 4000 x 4000 router might logically cost $80 million.

The hope for a simple relationship breaks down, however, for several reasons. First, power supplies, frames and control do not scale the same way, so the total number might be half that, or substantially less. The technology is straightforward. You ask for a signal that is on the input list, and it simply shows up on the output. That costs money and leaves a lot of crosspoints unused, which are logically not rational. (HD sources to SD destinations, SD sources to HD destinations and key signals to camera return feeds are obvious examples.) So, at any cost, which no doubt would be huge, a path-finding approach was more rational and would not put the entire plant at risk of a single point of failure.

But what is different with a path-finding approach is that commands to switch a signal through the entire routing "fabric" become increasingly complex as the number of routers increases. To get a signal, the system must find and allocate ports on the input router, the core router and the output router. The idea of a non-blocking path is, of course, no longer possible, and the sizing must be done carefully. In this case, the three routers in the new plant are from one manufacturer.

This sounds simpler, except those routers connect to additional routers in control rooms, graphics, transmission and other areas of the plant. Those routers are from a number of manufacturers, making the control not so transparent. Maps of all of the available signals have to be in every router to make such an approach work, which is of itself not a simple task in a large and complex facility.

Vendor independence

The most challenging part of this concept may be the "cross platform" vendor independence. ABC chose to have all vendors write to published interfaces that they all supported. That was not simple, but at least vendors did not have to open their proprietary hardware and software to competitors' scrutiny.

The results were astounding (to me at least). It proves that protecting intellectual property and still responding to legitimate technology needs do

not have to be mutually exclusive. Maintaining a system in which multiple software products must interact may be the ultimate test of this interoperability exercise. Indeed, migrating versions of software in the system after deployment and turn on is a tricky business. Even that has been carefully considered, and the installed system has a great deal of fault tolerance in the control system despite multiple vendors dependent on each other.

Monitoring

I haven't mentioned monitoring yet, but that too is part of the plan for the ABC facility, as it should be in all modern facilities. It uses "probes" on the input signals, and output signals as well, to return thumbnails and first-level measurements of all signals as they enter and leave the plant.

Another unique aspect of the system is that the routers are interconnected entirely on fiber. Of course, fiber presents a bit of a challenge for monitoring, so at critical points in the system, signals hit optical hybrids, which split the signal into a couple of outputs passively. A monitoring point is pulled from the hybrid and left on a jackfield for test purposes only. The active devices in the system are all monitored by SNMP, routers, audio embedders and shufflers, and probes. The operators use a sophisticated monitoring center to view reports from the monitoring system on close-up displays controlled through a KVM matrix, and on a large multi-image monitor wall.

The control room is used to check-in feeds from sports and news locations, and the equipment the operators have allows measurement and adjustment to ensure the highest quality. In an effort to simplify the operator's interface, ABC chose to have the waveform rasterizer controlled by the same unified control system that controls the router, proc amps and other hardware. In a very real sense, the monitoring and control systems have been tightly coupled.

Setting a high bar

Not all installations need to be this complex, either now or in the future. Small broadcast stations do not need path-finding routers and fiber interconnects. However, this facility illustrates what is possible when vendors and customers look at real-world needs with a clean sheet of paper.

All facilities can benefit from reduced apparent complexity that is abstracted by the monitoring and control systems. It allows operators to see the essential information without having to have access to the full depth all the time. Such systems also allow monitoring and control to be done in a centralized location rather than running to the rack room to adjust things that can be easily remoted to a single operating position.

The approach ABC took is not entirely without precedent, but in terms of scale, it is one of a kind to my knowledge. It sets a very high bar for monitoring and control, without which the system could not have been abstracted to the level it has been. Operators could not easily understand and control a system with as much complexity as this without well-crafted software solutions to do their bidding and return information necessary for understanding the system status. BE

This facility illustrates what is possible when vendors and customers look at real-world needs with a clean sheet of paper.

John Luff is a broadcast technology consultant.

? Send questions and comments to: john.luff@penton.com

CLASSIFIEDS

For Sale

Help Wanted

IMMEDIATE OPENING

Univision Television Group seeks experienced, forward thinking, emerging technology oriented broadcast leaders to fill current opportunities in our San Francisco and Phoenix/Tucson/Flagstaff markets.

Successful candidates will be responsible for the management, integration, operation and maintenance of all technical facilities along with technology based workflows throughout the broadcast facility. The candidate must possess a comprehensive knowledge of all FCC rules and regulations insuring compliance of our broadcast television technical operations.

In depth VHF/UHF television transmitter, microwave and IT knowledge, and experience is a prerequisite for this position. The successful candidate can expect to be directly involved with technical budgeting, bench work troubleshooting as well as planning and purchasing equipment and capital items.

Resumes for SF location:
sanfranciscojobs@univision.net
Resumes for AZ location:
arizonajobs@univision.net.
EEO

Television Remote Engineer - EIC

IMS Productions, one of the industry's leading mobile television companies, has an opening for a qualified Engineer in Charge. Engineer should have extensive knowledge in Grass Valley Kalypso and Kayenne switchers, RTS ADAM intercom systems, Calrec and Yamaha Audio consoles, Chyron Hyper X 3, N Vision routers, with Jupiter control and Sony HDC cameras. Applicant must also have a large system overview as we cover major sporting and entertainment events nationwide and abroad. Engineer must have the equivalent of an associate's degree in applied electronics with a minimum of 3 year's mobile television experience as an EIC. Above all, the applicant must be a self-starter with good work ethics, great attitude and the ability to work under pressure. If interested please email resume to Robby Greene at **rgreene@brickyard.com** or mail to IMS Productions at 4555 W. 16th St., Indianapolis, IN 46222.

SPINNER ATLANTA, INC. IS EXPANDING - BROADCAST SALES ENGINEER

Seeking a well-rounded Broadcast Sales Engineer to support our Broadcast Division. Must have strong Sales and RF Engineering experience with an emphasis in broadcast systems and equipment; particularly with combining, filtering and switching. Must have a working knowledge of ATSC, ISDBT, DAB, DMB and DTMB standards. Be the technical liaison and commercial interface with customers to provide both pre and post sales support. Have intimate knowledge of Broadcast OEM companies in North America and competitors. Should have a consultative sales approach and ability to close sales. Travel is required. Must have EE or ME; 5+ years RF broadcast experience including equipment selection for transmitters, towers and antennas – microwave, UHF/VHF and some field experience. Great benefits including 401(k), Medical, Dental, Vision.

Send resumes to: **debra.jimenez@spinnergroup.com** or Debra Jimenez, Spinner Atlanta, Inc. 4355 International Boulevard, Suite 200, Norcross, GA 30093.4555 W. 16th St., Indianapolis, IN 46222.

Broadcast Engineering Technicians – MTV Networks

24/7 environment seeks candidates to maintain the technical integrity of a Network Operations Center. Candidates should have approx. 5 years experience in broadcast TV with maintenance experience with VTRs (DigiBeta, HD-Cam, and Beta SP) and Server based video playout platforms (Pinnacle & Grass Valley), Master control video switchers (Miranda & Saturn), Video/audio routers, and Digital tape archives. Strong knowledge in Baseband Video/Audio is required, knowledge of RF infrastructures a plus. Certificates in Harris/Louth Automation, Sony VTR mainten-ance on DigiBeta VTRs, MCSE, A+ Certification, or SBE preferred. Please email all resumes to **nocstaffing@mtvstaff.com**, or fax to 201-766-7243.

A PENTON MEDIA PUBLICATION
BroadcastEngineering®
www.broadcastengineering.com

Editorial Director: Brad Dick, brad.dick@penton.com
Editor: World Edition: David Austerberry, editor@broadcastengineeringworld.com
Managing Editor: Susan Anderson, susan.anderson@penton.com
Assoc. Editor: Collin LaJoie, collin.lajoie@penton.com
Assoc. Editor: Angela Snell, angela.snell@penton.com
Assoc. Editor: Andrew Ward, andrew.ward@penton.com
Sr. Art Director: Michael J. Knust, mike.knust@penton.com
Art Director: Robin Metheny, robin.metheny@penton.com
Technical Consultants: Computers & Networking – Brad Gilmer
Digital Video – Aldo Cugnini
Legal – Harry C. Martin
New Technology – John Luff
Industry Watcher – Anthony Gargano
New Media – Craig Birkmaier

Group Publisher: Wayne Madden, wayne.madden@penton.com
Sr. Marketing Manager: Kim Davidson, kim.davidson@penton.com
Dir., Online Product Development: Dean Muscio, dean.muscio@penton.com
Senior Director of Production: Carlos Lugo, carlos.lugo@penton.com
Production Manager: Kathy Daniels, kathy.daniels@penton.com
Classified Ad Coord.: Sarah Maxey, sarah.maxey@penton.com
Audience Development: Kris Cunningham Kristi.Cunningham@penton.com
Group Show Director/LDI: Sharon Morabito, sharon.morabito@penton.com

Penton
Penton Media, Inc.
249 West 17th Street
New York, NY 10011
Chief Executive Officer: Sharon Rowlands, sharon.rowlands@penton.com

MEMBER ORGANIZATIONS
Sustaining Member of:
• Society of Broadcast Engineers
Member, American Business Media, member, BPA International,
The Missouri Association of Publications

BE US/Canada SUBSCRIPTION RATES: Free and controlled circulation to qualified subscribers. Non-qualified persons may subscribe at the following rates (subject to change): USA and Canada one-year subscription (12 issues) $99. Outside the USA and Canada $116. Customer service can be reached at: broadcastengineering@pbinews.com or by calling 866-505-7173 or 847-763-9504

BE World SUBSCRIPTION RATES: Free and controlled circulation to qualified subscribers. Non-qualified persons may subscribe at the following rates (subject to change): USA and Canada one-year subscription (12 issues) $94. Outside the USA and Canada $110. Customer service can be reached at: broadcastengineering@pbinews.com or by calling 866-505-7173 or 847-763-9504

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 Penton Reprints to purchase quality custom reprints or e-prints of articles appearing in this publication at 888-858-8851. Website: www.pentonreprints.com. Email: reprints@pentonreprints.com

EDITORIAL and BUSINESS OFFICE: Penton Media, 9800 Metcalf, Overland Park, Kansas 66212 • 913-341-1300 • penton.com

AD INDEX

Broadcast Engineering is not responsible for errors in the Advertisers Index.

Advertiser	Page #	Hotline	Website Address
AJA Video	13	800-251-4224	aja.com
Apantac LLC	102	503-616-3711	apantac.com
ATTO Technology Inc.	37	716-691-1999	attotech.com
Avid Technology	3	800-949-AVID	avid.com/mmm/interplay
Avitech	24	877- AVITECH	avitechvideo.com
Axon Digital Design	51	301-854-6557	axon.tv
Blackmagic Design	5	408-954-0500	blackmagic-design.com
Calrec Audio Ltd.	34	+44(0)1422842159	calrec.com
Clear-Com Communication Systems	121	510-496-6600	clearcom.com
Cobalt Digital	18	800-669-1591	cobaltdigital.com
DK Technologies	Map 7	+45 4485 0255	dk-technologies.com
Doremi Labs Inc.	31	818-562-1101	doremilabs.com
Ensemble Designs	55, Map 4, Map 23	530-478-1830	ensembledesigns.com
ESE	103	310-322-2136	ese-web.com
Evertz Microsystems Ltd.	IBC	877-995-3700	evertz.com
EVS Broadcast Equipment	7	973-575-7811	evs.tv
Fischer Connectors	115	800-551-0121	fischerconnectors.com
Florical Systems Inc.	117	800-372-4613	florical.com
For. A Corporation of America	88, 89	714-894-3311	for-a.com
Front Porch Digital	35		fpdigital.com
Fujinon/FUJIFILM - Optical Devices Division	91	973-633-5600	fujinon.com
Grass Valley	Map 24		grassvalley.com/trinix_nxt
Harris	27	800-231-9673	harrisbroadcastlive.com
Intelsat	53	+44 20-3036-6700	intelsat.com
Isilon Systems	29		isilon.com/broadcast
Junger Audio	120		junger-audio.com
Lawo North America Corp.	106	416-292-0078	lawo.de
Linear Acoustic	25	717-735-3611	linearacoustic.com
Litepanels	109	818-752-7009	litepanels.com
Matrox Electronic Systems	21	800-361-4903	matrox.com/video
Miranda Technologies Inc.	9	514-333-1772	miranda.com/itx
Myers Information Systems	84	413-585-9820	myersinfosys.com
NAB Show 2011	119		nabshow.com
NCS Industries	86	877-299-4614	ncsind.com
Nevion	107	800-515-0811	nevion.com
Newtek Inc.	10-11	210-370-8000	newtek.com/be
Octopus Newsroom	16		octopus-news.com
Omneon, now part of Harmonic	23	866-861-5690	omneon.com/spectrumdelivers
On Call Communications	Map 14	949-716-3030	occsat.com
Optical Cable Corporation	36	540-265-0690	occfiber.com/broadcast
Phabrix Ltd	125	800-645-5104	leaderusa.com
PlayBox	BC	404-424-9283	playbox.tv
Quantel Ltd.	113		quantel.com/qtube
Riedel Communications	83, 85, 87	818-241-4696	riedel.net
Rohde & Schwarz	15		rohde-schwarz.com
Rohde & Schwarz GmbH	47		rohde-schwarz.com/ad/onair-useu/be
Rohde & Schwarz GmbH	49		rohde-schwarz.com/ad/first-useu/be
Screen Service America	33	888-522-0012	screenservice.net
SeaChange	92	978-897-0100	schange.com/products/broadcast
Sencore	39, Map 1, Map 9	605-978-4810	sencore.com
SGL	Map 5		sgluk.com
Sierra Video Systems	Map 12 -13		sierravideo.com
Snell Group	93		snellgroup.com
Solid State Logic	IFC	212-315-1111	solidstatelogic.com/c10
Stagetec USA	94	888-782-4391	stagetec.com
Stanford Research Systems	57	408-744-9040	thinksrs.com
Stratos	108	800-563-2255	stratosglobal.com
Streambox	Map 8, 105	206-956-0544	streambox.com
Studer USA	45	866-406-2349	studer.ch
TBC Consoles Inc.	104	1-888-console	tbcconsoles.com
Thales Angenieux	19	973-812-3858	angenieux.com
Thinklogical	101	800-291-3211	thinklogical.com
Thomson Video Networks	43		thomson-networks.com
Triveni Digital	41		trivenidigital.com
TV One	95	800-721-4044	tvone.com
Utah Scientific	17	800-453-8782	utahscientific.com
Videssence	Map 2	626-579-0943	videssence.tv
Wohler Technologies Inc.	96, 97, 98, 99	888-5-WOHLER	wohler.com
Zeus Broadcast	Map 11	407-352-6501	zeusbroadcast.com

SALES OFFICES

US/CANADA

WEST
George Watts III
(360) 546-0379; Fax: (360) 546-0388
georgeww3@aol.com

EAST
Emily Kalmus
(312) 840-8473; Fax: (913) 514-6301
emily.kalmus@penton.com

INTERNATIONAL

EUROPE
Richard Woolley
+44-1295-278-407
Fax: +44-1295-278-408
richardwoolley@btclick.com

ISRAEL
Asa Talbar
Talbar Media
+972 (77) 562-1900
talbar@talbar.co.il

JAPAN
Mashy Yoshikawa
Orient Echo, Inc.
+81-3-3235-5961; Fax: +81-3-3235-5852
mashy@fa2.so-net.ne.jp

ASIA PACIFIC
Tan May Ling
InterAct Media & Marketing
+65 9623 1405; Fax: +65 6265 3000
tmling@singnet.com.sg

CLASSIFIED ADVERTISING
Julie Dahlstrom
(312) 840-8436
Fax: (913) 514-3684
julie.dahlstrom@penton.com

REPRINTS
Penton Reprints
888-858-8851
www.pentonreprints.com

LIST RENTAL SERVICES
Marie Briganti
MeritDirect
(877) 796-6947
mbriganti@meritdirect.com

Customer Service:
913-967-1707 or 800-441-0294

Broadcast Engineering, March 2011, Vol. 53, No. 3 (ISSN 0007-1994) is published monthly and mailed free to qualified persons by Penton Media, Inc. 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. 40612608. Canada return address: Bleuchip International, P.O. Box 25542, London, ON N6C 6B2. 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.

Micro Four Thirds for video

Video capture tools get curiouser and curiouser.

BY ANTHONY R. GARGANO

Some time ago, I wrote about a variety of non-traditional tools for broadcast and video production applications. Subsequently, it was announced that last season's final episode of the Fox Network show "House" was to be shot exclusively with Canon DSLR cameras used in the HD video mode. DSLR cameras are the still picture, digital image capture successors to 35mm film SLR cameras. Most DSLR manufacturers had only recently added video capture modes to the feature set of their top models when the director of "House," Greg Yaitanes, collaborated with DP Gale Tattersall to decide on this groundbreaking shoot.

No sooner had that been accomplished than another creative director, Randall Wallace, decided to shoot footage with an even smaller sensor camera, the Olympus Pen E-P1 and its Micro Four Thirds format.

Full frame 35mm DSLRs use a sensor that is 36mm x 24mm for a total imaging area of 864mm^2. Micro Four Thirds, which derives its name from the use of a sensor that is twice the 2/3in sensor size that typical point-and-shoot cameras and some video camcorders use, has an 18mm x 13.5mm size sensor. The actual imaging area is slightly smaller at 17.3mm x 13mm, or 225mm^2 total. Wait, you might say, professional camcorders such as Sony's XDCAM use 2/3in sensors. That's true, but typically, like XDCAM, they use three of them — one for each color channel.

But back to our Micro Four Thirds shoot. Under director Wallace, cinematographer Dean Semler and DP Kris Krosskove were able to shoot with the E-P1 camera "... in places where the eye could never get to ... ." They had cameras everywhere from hoof level at the starting gate of a horse race to 4in in front of the flaring nostrils of a galloping horse. Krosskove was himself captured in a video clip riding the back of a stabilized pick-up truck at 40mph with a camera mounted on a painter's pole traveling just inches above the ground. He was beaming with pride when he shared with me, "There's been nothing like those race scenes ever before."

Second unit director and director of photography Kris Krosskove capturing footage from a unique perspective using a micro four thirds camera for video capture

The subject of the article, the tiny 4.8in x 2.8in x 1.4in camera that was used to capture video sequences for large-screen display

Marriage of a high-tech camera with plastic bags, duct tape, gaffer's tape and a painter's pole

And, what were the scenes he was discussing? They were for the hit Disney movie, "Secretariat." So, we have now had the 21 megapixel Canon DSLR camera used for shooting a television episodic and Olympus' diminutive Micro Four Thirds camera, with an imager almost 75 percent smaller than the Canon, being used to capture footage for theatrical release and theater size displays. This is an area where broadcasters owe a debt of gratitude to content creators. The creative side is happily pushing the envelope of HD video capture technology with the use of some inexpensive tools. In so doing, they are providing broadcasters with a proof of concept that can have quite a favorable impact on station capital budgets. The current generation of still video cameras is not without its problems, particularly when it comes to handling audio and things like variable frame rates and focus pulling. But, manufacturers are listening and are promising versions that are more video application friendly. Broadcasters need to be mindful of these developments. That future ENG camera or magazine show shoot might be taking on a very different and less costly equipment look. BE

Anthony R. Gargano is a consultant and former industry executive.

? Send questions and comments to: anthony.gargano@penton.com

End-To-End Workflow

evertz

Optimizing End-to-End Workflow

The Complete Multi-Cast Facility by evertz

Evertz® now offers a complete solution that is well beyond strictly infrastructure, core routing, and multi-viewing. We now deliver an integrated facility that provides superior file/non-file based multi-channel ingest and playout systems with advanced asset management tools.

With the combination of **Evertz Media Server** (EMS), **OvertureRT LIVE** (channel playout), and Pharos' **Mediator®** (content management and workflow tools), we deliver a workflow optimized for the modern Multi-Cast facility. Coupled with our award winning unified facility control system (**MAGNUM™**) and our robust NMS (**VistaLINK® PRO**), Evertz® provides an end to end solution for facilities that deliver content to television, video-on-demand, WebTV, IPTV, and mobile devices.

NAB2011 - Booth N1602, SU4307 **www.evertz.com • 1.877.995.3700**

evertz

US West Coast Sales
818.558.3910
LAsales@evertz.com

New York Sales
newyorksales@evertz.com

Washington DC Sales
703.330.8600
dcsales@evertz.com

UK Sales
+44 118 935 0200
uksales@evertz.com

South-East Europe Sales
+385-1-2059-325
SEuropesales@evertz.com

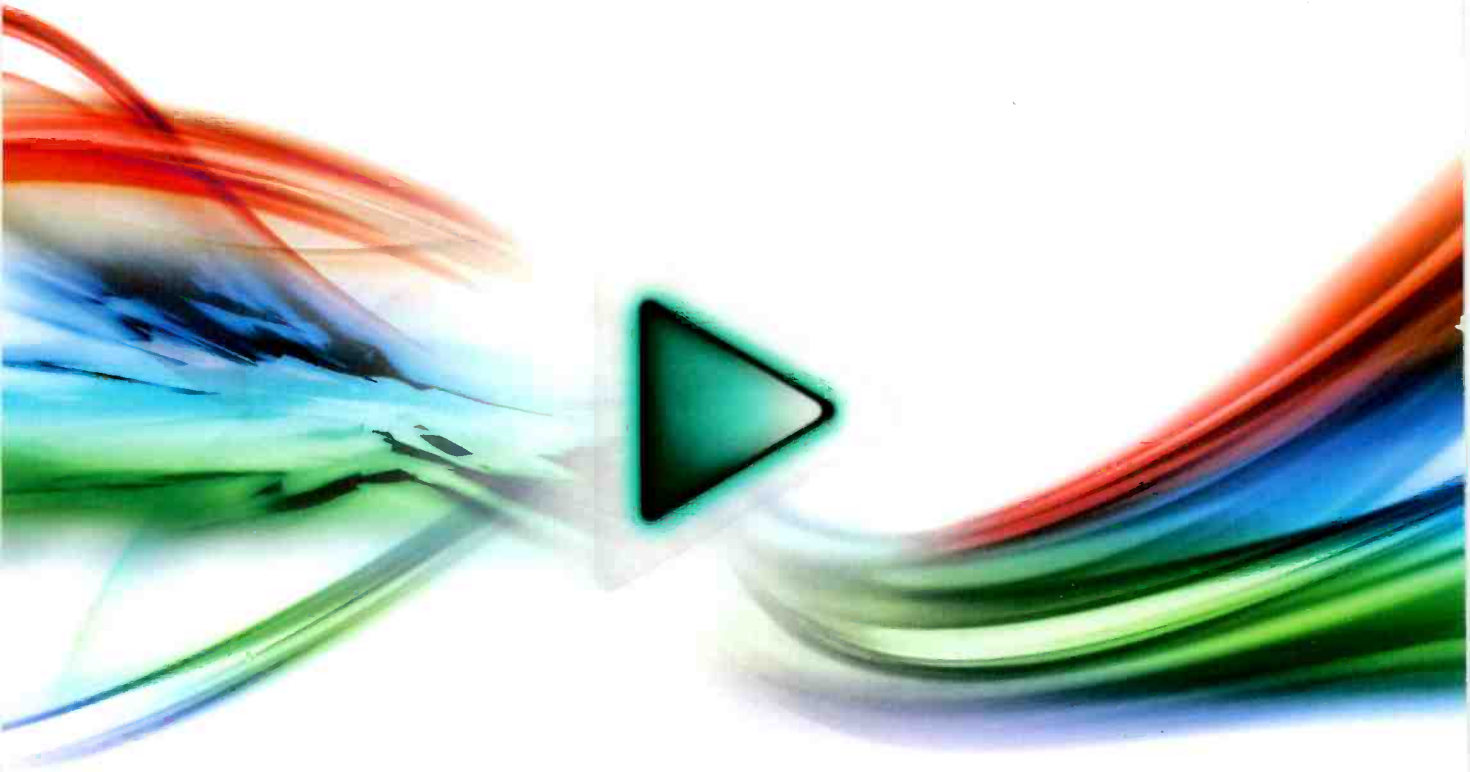
Dubai Sales
011-971-50693-0204
middleeastsales@evertz.com

Asia Pacific Sales
+852 2850-7989
asiapacificsales@evertz.com

PLAYBOX TECHNOLOGY

From a Single Channel Playout Server to a Multi Channel Turnkey Broadcast Centre

It's All in a PlayBox



- **Single and Multi Channel Playout Automation with interactive CG and Graphics**
- **Traffic Management • Media Asset Management and Archive • Newsroom System**
- **Remote Redundant Playout • Ad Insertion and DPI • Time Shift**
- **IPTV and Internet TV Solutions**
- **Available in HD / SD and DVB (ASI/IP)**

General Sales Contacts: sales.usa@playbox.tv • **Website:** www.playbox.tv

• **PlayBox UK** +44 1707 66 44 44 • **PlayBox Bulgaria** +359 2 9703050 • **PlayBox Romania** +4 031106 5115
• **PlayBox Turkey** +90 216 3379402 • **PlayBox Germany** +49 22411691717 • **PlayBox Adria** +381 113117286
• **PlayBox Albania** +355 44 80 45 52 • **PlayBox USA** +1 404 424 9283 • **PlayBox Asia Pacific** +6012 2880760
• **PlayBox India** +91 9811913333

NABSHOW Where Content Comes to Life

Join PlayBox on Booth N5835