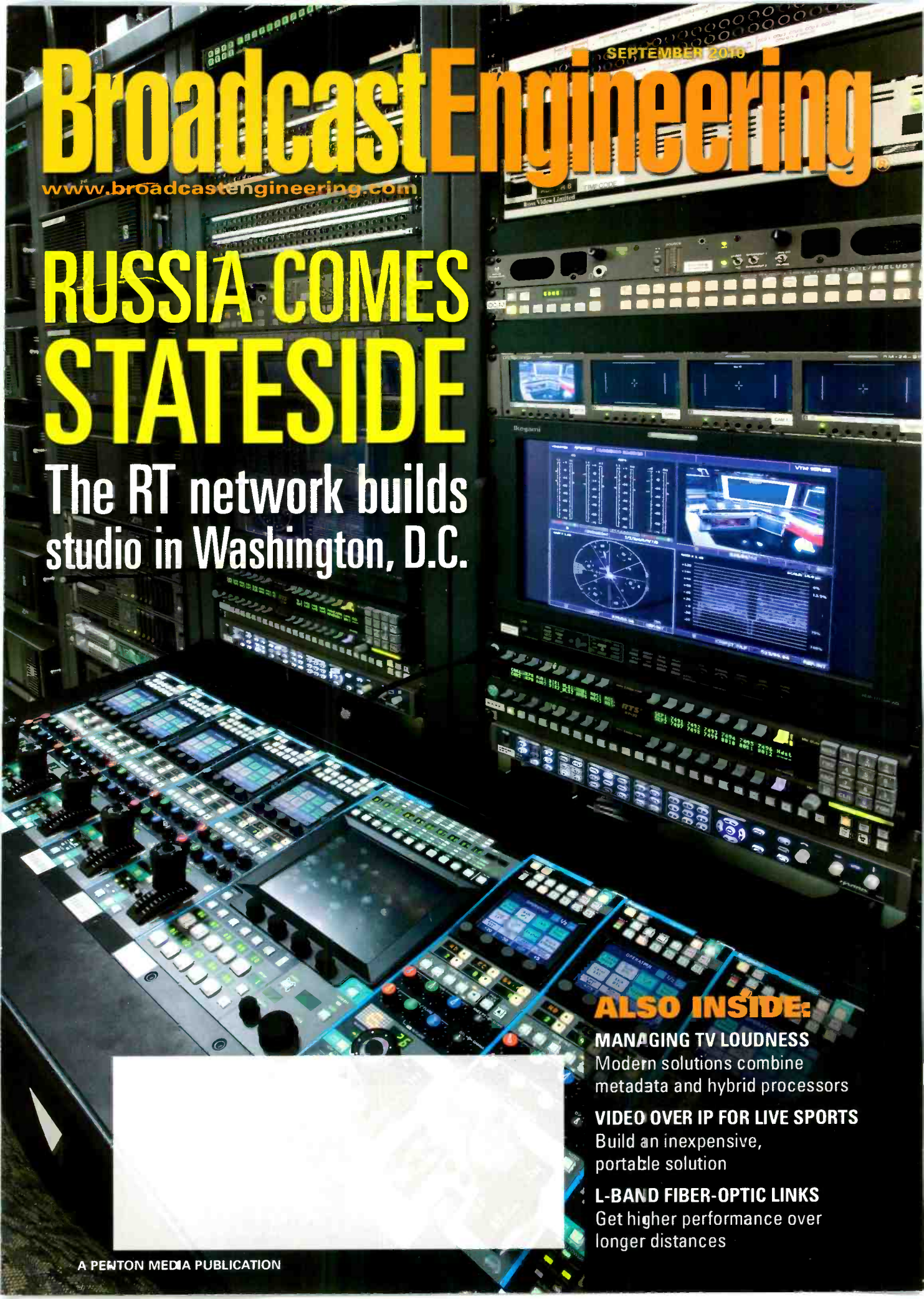
SEPTEMBER 2010

Broadcast Engineering

www.broadcastengineering.com

RUSSIA COMES STATESIDE

The RT network builds studio in Washington, D.C.



ALSO INSIDE:

MANAGING TV LOUDNESS
Modern solutions combine metadata and hybrid processors

VIDEO OVER IP FOR LIVE SPORTS
Build an inexpensive, portable solution

L-BAND FIBER-OPTIC LINKS
Get higher performance over longer distances

A PENTON MEDIA PUBLICATION

SCREEN SERVICE AMERICA LLC

6095 NW 167th Street, Suite D-10
Miami, FL 33015
USA
Phone: +1 (305) 826-2212
Fax: +1 (305) 826-2290
USA Toll Free 1-888-522-0012
Email: info@screenservice.net
www.screenservice.net

RRD USA Inc.

350 5th avenue, suite 3600
New York, NY, 10118
USA
Phone 1: +1-212-695-8378
Phone 2: +1-212-695-8341
Fax: +1-212-695-8371
Email: info@rrdus.com
www.screenservice.net

AVID

Make the Most of Your Media

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

Avid® ISIS® 5000 is a new advanced, affordable video storage solution that offers the world's best means of maximizing both. It provides the proven reliability, performance and collaborative capability you need to put your media to work more effectively than ever before—at a price you can afford.

See how. Visit **www.avid.com/mmm**

TABLE OF CONTENTS

VOLUME 52 | NUMBER 9 | SEPTEMBER 2010

Broadcast Engineering®

FEATURES

BEYOND THE HEADLINES

DOWNLOAD

FCC UPDATE

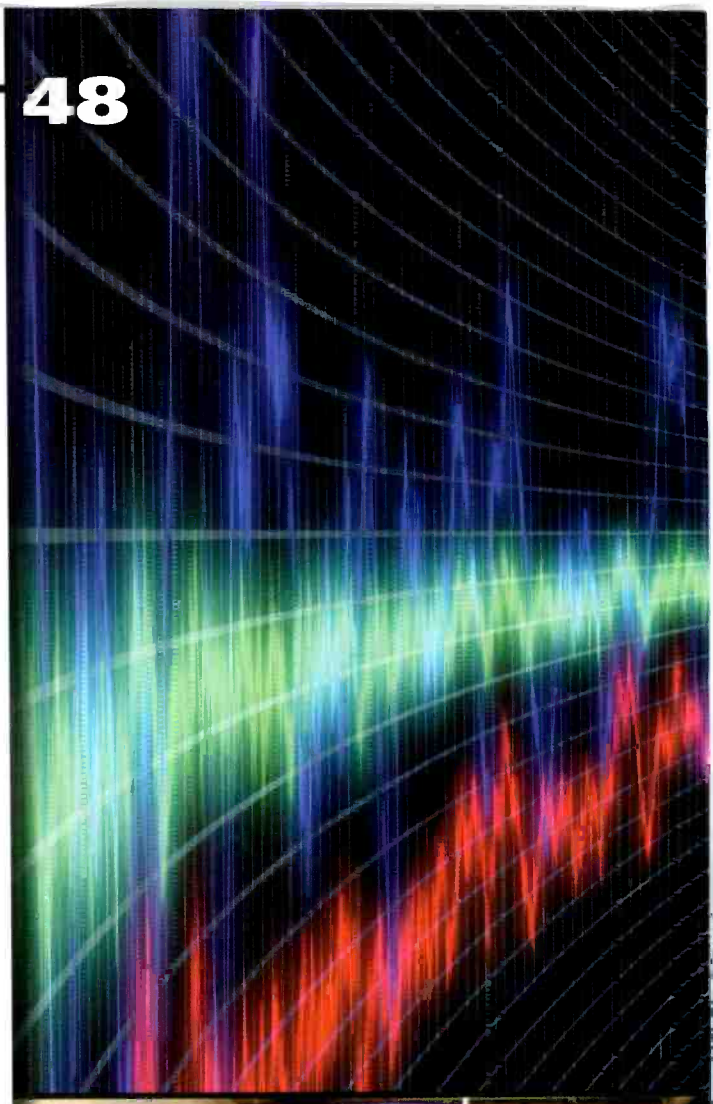
DIGITAL HANDBOOK

TRANSITION TO DIGITAL

COMPUTERS & NETWORKS

PRODUCTION CLIPS

continued on page 6



CONGRATULATIONS!

Broadcast Engineering consultant John Luff has won the 2009-2010 SBE Broadcast Engineer of the Year Award! He was nominated for this prestigious award for the work he has done in the broadcast engineering industry as well as on a local level within SBE Chapter 20, Pittsburgh. Luff has been a member of SBE since 1984.

Learn more at *www.broadcastengineering.com*

Blackmagicdesign

SDI to Analog
$495

Analog to SDI
$495

SDI to Audio
$495

Audio to SDI
$495

SDI to HDMI
$495

HDMI to SDI
$495

Optical Fiber
$495

Sync Generator
$295

The most advanced 3 Gb/s converters for SD and HD that include AES/EBU and analog audio!

Build your studio with the world's most advanced converters. Only Mini Converters include auto SD/HD switching, redundant input, AES/EBU and analog audio on 1/4 inch jack connections, plus advanced 3 Gb/s SDI! There are 8 great models to choose from depending on the conversion you need!

Auto Switching SD and HD

Mini Converters instantly switch between all SD and HD formats, including NTSC, PAL, 1080i/59.94, 1080i/50, 1080PsF/23.98, 1080PsF/24, 720p/59.94, 720p/50. Updates can be loaded via USB.

Redundant SDI Input

Most Mini Converters feature a redundant input and loop through SDI output. Connect a redundant SDI cable to the second input, and if the main SDI input is lost, Mini Converters will automatically switch over in an instant. That's great for mission critical tasks such as live events.

Pro Analog and AES/EBU Audio

Standard 1/4 inch jacks are built in to most Mini Converters for professional balanced audio that switches between AES/EBU or analog. Unlike other converters you don't need expensive custom audio cables.

3 Gb/s SDI Technology

Mini Converters include the latest 3 Gb/s SDI technology, so you're always future proofed! 3 Gb/s SDI is also fully compatible with all your existing standard definition and high definition SDI equipment.

Broadcast Quality

Mini Converters are built to the highest quality standards with low SDI jitter, so you get the longest SDI cable lengths combined with ultra low noise broadcast quality analog video and audio. Mini Converters are the world's first converters to include 3 Gb/s SDI on all models!

Eight Exciting Models

Mini Converters include more new technologies than other converters, while every model is an affordable $495. The Sync Generator model is only $295!

Mini Converters
$495
Sync Generator
$295

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

TABLE OF CONTENTS (CONTINUED)

VOLUME 52 | NUMBER 9 | SEPTEMBER 2010

SYSTEMS INTEGRATION

SHOWCASES

DIGITAL TUTORIAL

NEW PRODUCTS & REVIEWS

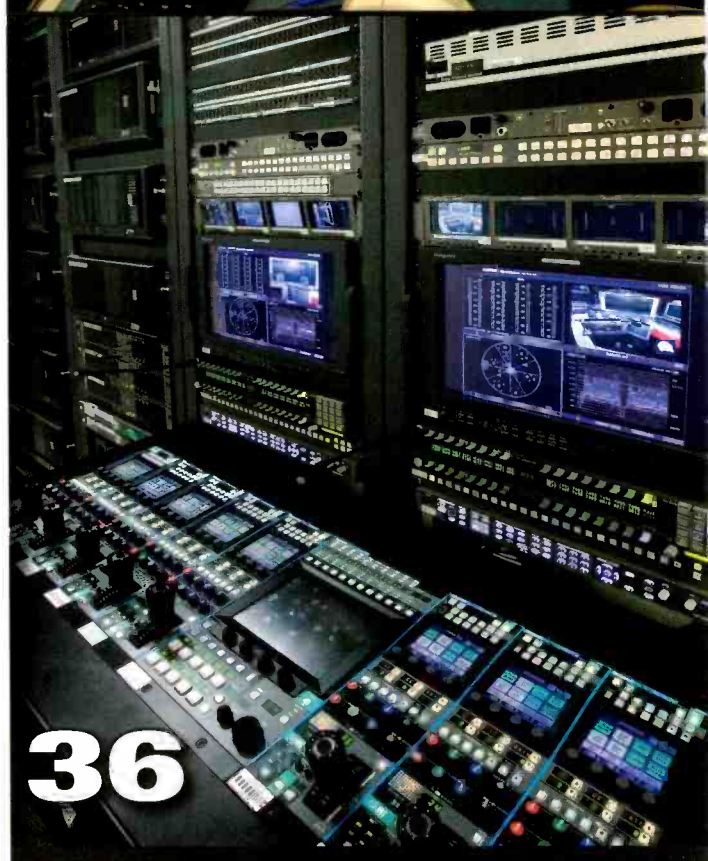
APPLIED TECHNOLOGIES

FIELD REPORT

TECHNOLOGY IN TRANSITION

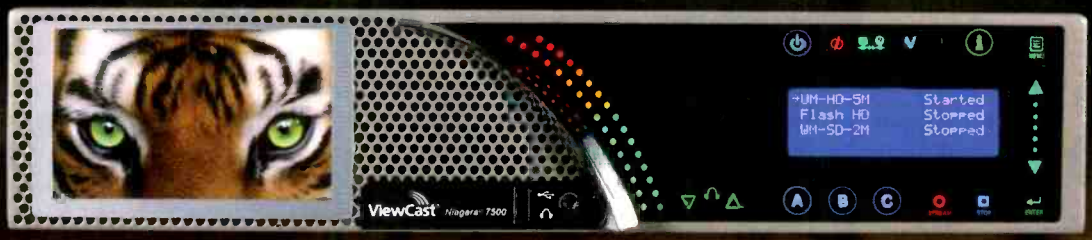
NEW PRODUCTS

DEPARTMENTS



ON THE COVER:
RT uses a six-channel graphics system that enables the Washington, D.C., and Moscow bureaus to share elements.

Beauty on the outside.
Beast on the inside.



It's easy to be enticed by the alluring good looks of the Niagara® 7500 – the newest HD streaming solution from ViewCast. On the outside, its sleek, innovative design and responsive touch-control interface will excite you. Its brilliant high-resolution HD display will dazzle you. But on the inside, it's a beast.

The Niagara 7500 devours your HD video and easily transforms it into high-quality streams for delivery to IP and mobile networks. Its powerful video pre-processing features streamline and simplify your workflow. Inverse telecine, closed caption extraction and rendering, de-interlacing, scaling, cropping and bitmap overlay are just a few of its standard features.

You can switch on-the-fly between HD or SD video, and with ViewCast's SimulStream® technology, you've got the power to stream simultaneously in multiple formats, bit rates and resolutions from a single SDI video source.

The Niagara 7500 from ViewCast. Beauty on the outside... a beast on the inside.

Speak with one of our streaming experts today at 800-540-4119, or visit us on the Web at viewcast.com to learn more.

Visit us at IBC 2010
Hall 9 - Stand # IP 312

ViewCast®

USA 800.540.4119 | Europe, Middle East, Africa +44 1256 345610

Broadcasters take the heat

Sens. John Kerry, D-MA, and Olympia Snowe, R-ME, have concocted a plan designed to punish broadcasters for doing what TV stations have done well for 70 years: broadcast.

Snowe referred to the nation's RF situation as a "spectrum crisis, maybe; spectrum reform, absolutely." She continued, "Also, several studies have observed low-spectrum occupancy rates or usage. So if spectrum isn't being used 100 percent of the time, it isn't a crisis; we just need more effective management." Translated: We need more government control.

Kerry droned on with similar bias, "Our nation's competitiveness, economic growth and national security demand that we allocate the necessary attention to current policy shortcomings, and enactment of this vital legislation will help avert the looming spectrum crisis and allow us to continue to enjoy the boundless benefits of spectrum-based services."

While their proposed bill, the Spectrum Measurement and Policy Reform Act, is characterized as merely the required regulatory infrastructure to conduct a spectrum inventory, the legislation goes far beyond just counting users and megahertz. It also establishes spectrum auction awards and permits the FCC to levy licensee fees that broadcasters are sure to find burdensome. In addition, the bill ensures that absolutely none of any spectrum auction proceeds will ever be deposited into the U.S. Treasury — as promised.

The Kerry/Snowe bill first demands $10 million in new funding over two years. For that, we get little more than a spreadsheet inventory listing users and spectrum in addition to another bureaucratic committee. The legislation also sets a 12-month timetable to establish four 120MHz channels for *each* of the following applications: sharing, reuse, temporary or dynamic short-term assignment and spectrum layering. These are in addition to the coming reduction of broadcast space. By year two, the NTIA and FCC must establish "pilot programs" within those channels.

Several aspects of the pending bill should concern broadcasters. First, the bill gives the FCC total freedom to determine what broadcasters might receive for voluntarily relinquishing their spectrum. Second, the bill sets forth two requirements the FCC must use when setting annual broadcaster licensee fees: "fair market commercial value" and "the public interest of the service the spectrum is being used for."

Interestingly, federal spectrum user license fees are based only on "fair market commercial value." In other words, only TV stations may be determined to be inefficient users of "public" spectrum, therefore requiring punishment in the form of high licensee fees.

Finally, the act would require that 30 percent of broadcast license fees go to maintaining what is called the Spectrum Relocation and Efficiency Fund, which is an account available exclusively to federal users. Currently, after eight years, any unspent money from this account is returned to the general fund of the U.S. Treasury. Under this bill, the money stays in the slush fund for 20 years. What are the odds of there being any money left after two decades?

This bill represents another piece of the administration's plan to penalize TV station owners who choose to remain in business, instead of getting out of the way of the Genachowski-Obama National Broadband Plan bus. If they hope to remain in business, broadcasters will need to be highly involved with their representatives and associations as this legislation moves forward.

For more information about the Spectrum Measurement and Policy Reform Act, turn to this month's FCC Update column, on page 18. BE

Brad Dick

EDITORIAL DIRECTOR

Send comments to: editor@broadcastengineering.com

BEFORE

NOW

Rethink embedded audio routing

Our NVISION 8500 Hybrid routers offer perfect audio processing to simplify signal management. With integrated de-embedding, shuffling, breakaway and re-embedding, a single router can now replace many racks of signal management gear. Ultra-short delays mean you don't need to worry about video/audio timing either. We're all for making things a bit easier.

Miranda

Rethink what's possible

www.miranda.com/nvision

Recently, the Second U.S. Circuit Court of Appeals in New York found the FCC's indecency policy to be unconstitutional. Regarding the ruling, some of our readers had this to say:

Some regulation needed

I am not in favor of an abundance of government regulation, but in some areas it is needed. This decision is just one more chip in the standards of decency. TV and radio stations are not obtained outside of and brought into the home in a knowing act like a book or newspaper. They are available to all in the living room, den, kitchen and even bedrooms (of children) at the turn of a switch or press of a button. A greater level of control on the content is really needed.

This does not take away from free speech. The foul speaking among us are still completely free to say what we want. But the TV and radio stations, operating on a license, should be careful of how much of that content they bring into our houses.

There isn't a single station out there that does not choose what news to air and what not to air. It would be far more helpful to *require* them to air *all* opposing opinions in such matters than it is to require or allow them to air obscene speech and indecent "costume failures."

As to how this is to be accomplished, a five- to 10-second delay with a silence or black switch should be quite easy in this day and age. I have done it for video using 2in VTRs in the old days, and it worked just fine. A simple digital box could do it today for almost no cost.

Paul

FCC did violate Constitution

Dear editor:

It might be added that the FCC in these cases violated at least the spirit of our constitutional protection against retroactive laws (Art I, Sec 9 & 10). The FCC altered its own regulations as to fleeting expletives, and as to what entities would be held responsible for them, and then applied the new regulations retroactively to instances that had occurred prior to the changes being made or promulgated. The court's ruling only slightly ameliorates the deadly effect of broadcasters now knowing that *anything* they do may become the subject of some future rule change that may then be applied retroactively with ruinous fines.

Norm

Video network security

During the Q&A of the August *Broadcast Engineering* webcast on MPEG monitoring and analysis, this question came up.

Dear editor:

Are PTS needed continuously to insure proper lip sync, or will PCR maintain lip sync once PTS achieves it?

Dick Perin

Aldo Cugnini responds:

In effect, a receiver uses the PCR to generate the local clock, and the PTS is used to sync up the audio and video. Once they're locked, the clocks will run together for a long time.

But the problem is that if there are transmission or buffer errors that compromise the streams, and the receiver can't get the PTS often enough, it might lose sync and then re-establish it out of spec. So the PTS must be sent at the required interval.

Promoting mobile TV

In the August issue of *Broadcast Engineering*, editorial director Brad Dick wrote about promoting mobile TV, which prompted this response.

Dear editor:

The idea that broadcasters need to promote the pending ATSC mobile TV service is obvious, but given their track record promoting HDTV from when it was first launched in 1998, I have low expectations for this essential effort.

It was amusing in the early days of HDTV broadcasting when the local stations in Los Angeles would "promote" HDTV by airing such ads only on the HDTV channels, not the NTSC channels the vast majority of the public were still viewing. The only people who saw the promos were people like me who already had HDTV receivers. Brilliant! By all accounts, few residents of Los Angeles County even knew there was OTA HDTV until just a few years ago. Most everyone thought HDTV was only available from satellite and cable companies, even broadband.

Unless the Open Mobile Video Coalition vigorously (and I mean with financial gusto) coordinates an industrywide effort to inform the public via OTA, cable, satellite, Internet, newspapers and other media advertising outlets that ATSC M/H is just around the corner, it will languish amongst oblivious souls as did broadcast HDTV for many years and possibly be overtaken by newer delivery means yet to be devised. At least have the local station newscasters talk it up once a week at 6 p.m. and 11 p.m. That's free! Lesson learned?

Craig Hubler

50Mbps MPEG-2 4:2:2

CF Card Recording

MXF File Wrapper

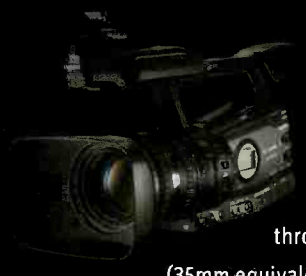
18x HD L-Series Lens

3 Native 1920x1080 CMOS Image Sensors

HD-SDI Output

Genlock Input

Under $8000



Rip this ad out and hand it over to purchasing.

Introducing the **Canon XF305 and XF300,** with a codec that gives you the image quality and streamlined workflow to meet a broad range of production needs. The XF series also employs non-proprietary dual CF card recording, and for efficient file management, the MXF File Wrapper facilitates metadata handling throughout the workflow. And then there's the 18x HD L-Series lens (35mm equivalent of 29.3–527.4mm) and three native 1920x1080 Canon CMOS Image Sensors. Which combined, offer a versatile zoom range and unsurpassed image quality. Impressing everyone in your production process, including accounting. usa.canon.com/camcorder

Canon

imageANYWARE

Intercom systems

Determining critical features can simplify the search.

BY ED FITZGERALD

The process of selecting the right intercom system for a broadcast or post-production facility, as with any major equipment investment, is seemingly daunting. It can seem like there are countless options to consider, making it tough to even figure out what the first step should be.

To simplify this process, break it down into three main steps, in this order: Conduct a comprehensive inventory of your facility's needs, read up on the basics of the three main types of intercoms, and then start researching manufacturers.

If you want to find the best intercom for your facility, take a good, hard look at its communications needs. The first thing you'll want to know is how many users the intercom system will need to handle and how they will use it. This will help you gain a solid estimate of the number of separate intercom channels, including private channels, you'll need. Some good questions to get you going are: Who needs to talk with whom? Are there wide distances between various production areas? Are some of your operations mobile/remote? Will you need wireless intercoms, and therefore the accompanying number of headsets and base stations? Put together a user profile before you start shopping for an intercom system, and it'll be much less stressful.

Next, look closely at your building's infrastructure to determine the physical coverage you'll need from the intercom. Is the existing wiring in good shape? If so, it will be easier to integrate an intercom system into the overall equipment workflow. Check for easy access to cable runs. If there is more than one building, consider the distances between them. You'll need an intercom system that can provide communications across these expanses.

Most intercom systems on the market can interface with many other types of equipment.

Most intercom systems on the market today can interface with a variety of other types of equipment such as telephones, four-wire devices, GPI/relays and IP, to name a few. Make a list of the gear you'll want to interface with the intercom to ensure the intercom will accommodate these needs. Also look into your IFB requirements. Does your facility need wired or RF IFB? A telephone IFB? On a related note, consider how your mixing console will interface with the intercom. A conversation with your head audio person would be helpful here.

Next, look at the staff members who'll be handling the intercom system. How much experience do they have with intercom systems? Do you think it'll be fairly easy to train them on the new intercom system's GUI? This is also a good time to determine whether your facility's daily workflow requires people to manipulate components of the intercom system quickly and on short notice. This is often the case with operations that handle a lot of live broadcasting. You'll want to make sure that the intercom system you choose has a GUI that is familiar to your staff members or is at least fairly easy for them to learn. That way, during busy production times, they won't waste precious seconds searching for a function.

Once you've conducted a thorough inventory of your facility's communications needs, make sure you are up-to-date on the basics of today's three types of intercom systems: party line, matrix and wireless.

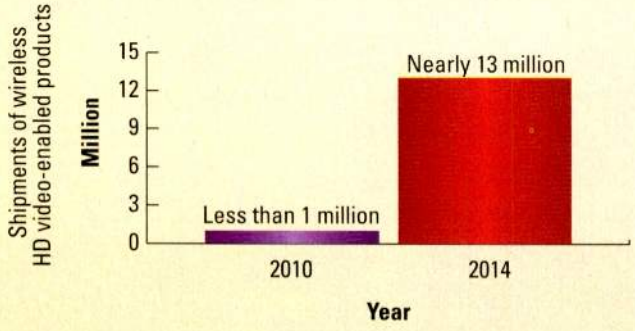
Party-line intercoms

The party-line intercom is the backbone of most entry-level and midlevel communications systems and is best for entry-level and midlevel users.

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

Growth of wireless HD video-enabled products increasing

In 2014, nearly 13 million wireless HD video products will ship.



Source: In-Stat

www.instat.com

How loud is it? Know for sure.

DOLBY

NEW Dolby® Media Meter 2 software

Now with added measurement options and digital audio workstation (DAW) compatibility

Accurate loudness measurement

is vital to creating a quality viewer experience. And Dolby® Media Meter 2 makes it easy. It's an ideal tool for program creation and quality control, and perfect for optimizing broadcast and disc media.

Version 2 builds on the original software, adding new measurement algorithms, new plug-ins for popular DAWs, and new features that include level meters, a high-quality peak limiter, and real-time graphing.

For accuracy, flexibility, and ease of use, Dolby Media Meter 2 offers unbeatable value at $795 (MSRP). We also offer a paid upgrade for current owners.

Dolby Media Meter 2 Features

- Dialogue Intelligence™ technology
- ITU-R BS.1770-1, Leq(m), Leq(A), True Peak, and Dialogue Range
- Complete logging functions

MAC/WINDOWS

- Stand-alone application for file-based measurement
- Digidesign® and VST plug-ins

MAC OS

- Mac® AU plug-in for Apple® software

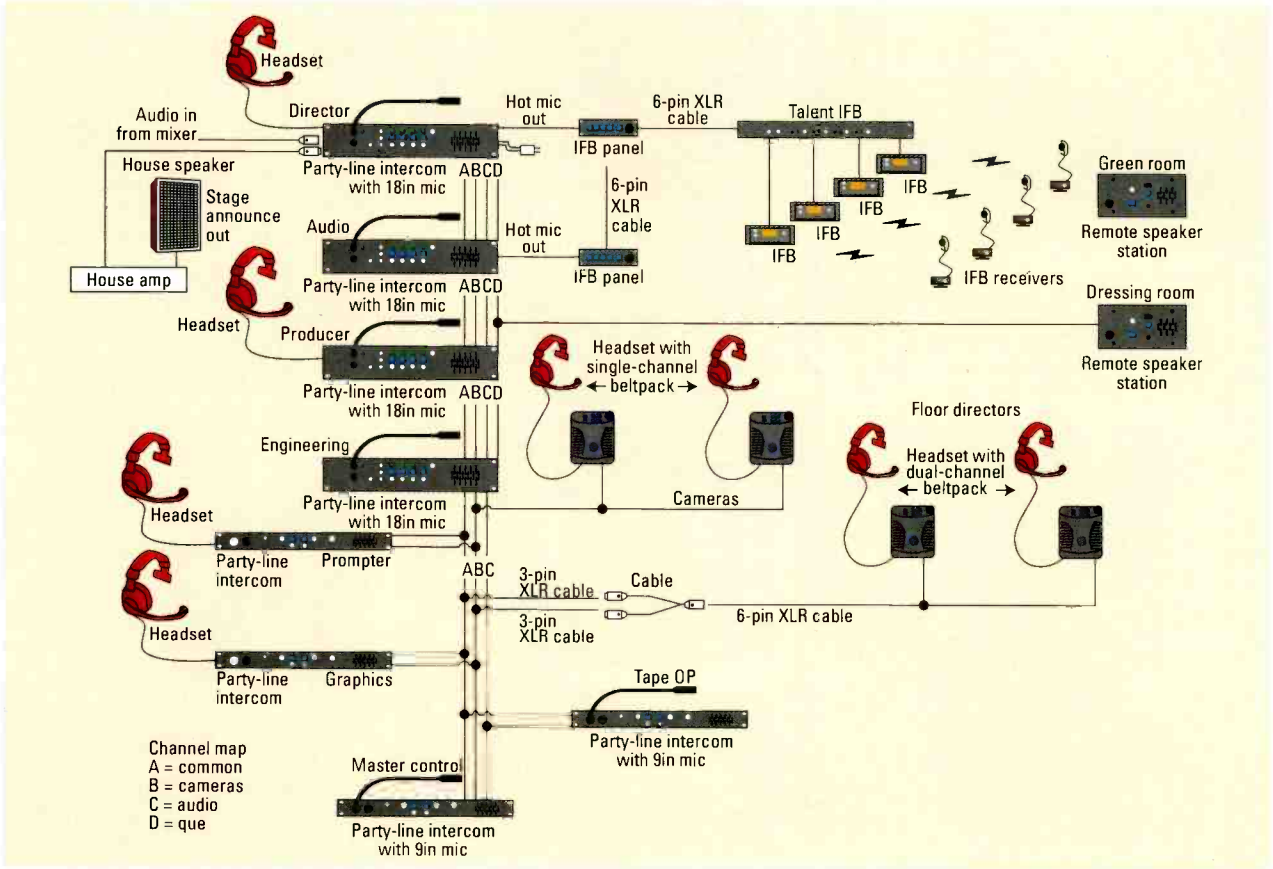


Figure 1. A simple party-line system

(See Figure 1.) As almost all intercoms use some party-line elements, an understanding of its workings is essential. The basic design principle is that the input and output outlets are married onto one circuit, with nulling circuitry being used to keep the two signals separate. Maintaining the null is important, so if you go with a party-line intercom, you'll want to add this into your regular maintenance cycles. Similar to a phone line, party-line systems use echo-canceling technology to keep talk and listen paths separate. They incorporate high-impedance bridging and a 200Ω termination circuit to keep the signal from diminishing when multiple beltpacks are added to the system. One major innovation party-line intercoms pioneered is the call signal, a convenient way to wake an operator up or get the attention of someone by flashing a light and/or placing a tone on the line. Some party-line devices will even buzz or vibrate. This is all delivered over a single microphone cable per channel.

Party-line systems can range in size from just a power supply and some beltpacks to multichannel systems, interfacing to anything you can imagine.

Party-line systems can range in size from just a power supply and some beltpacks to multichannel systems, interfacing to anything you can imagine. Typical systems have a main station, remote stations and a bundle of beltpacks. They are plug-and-play and run on regular microphone cable. (20AWG or 22AWG wire is recommended.) The only issue with the cabling is that there is some voltage on these lines, so take precautions against mixing them with microphones, for safety.

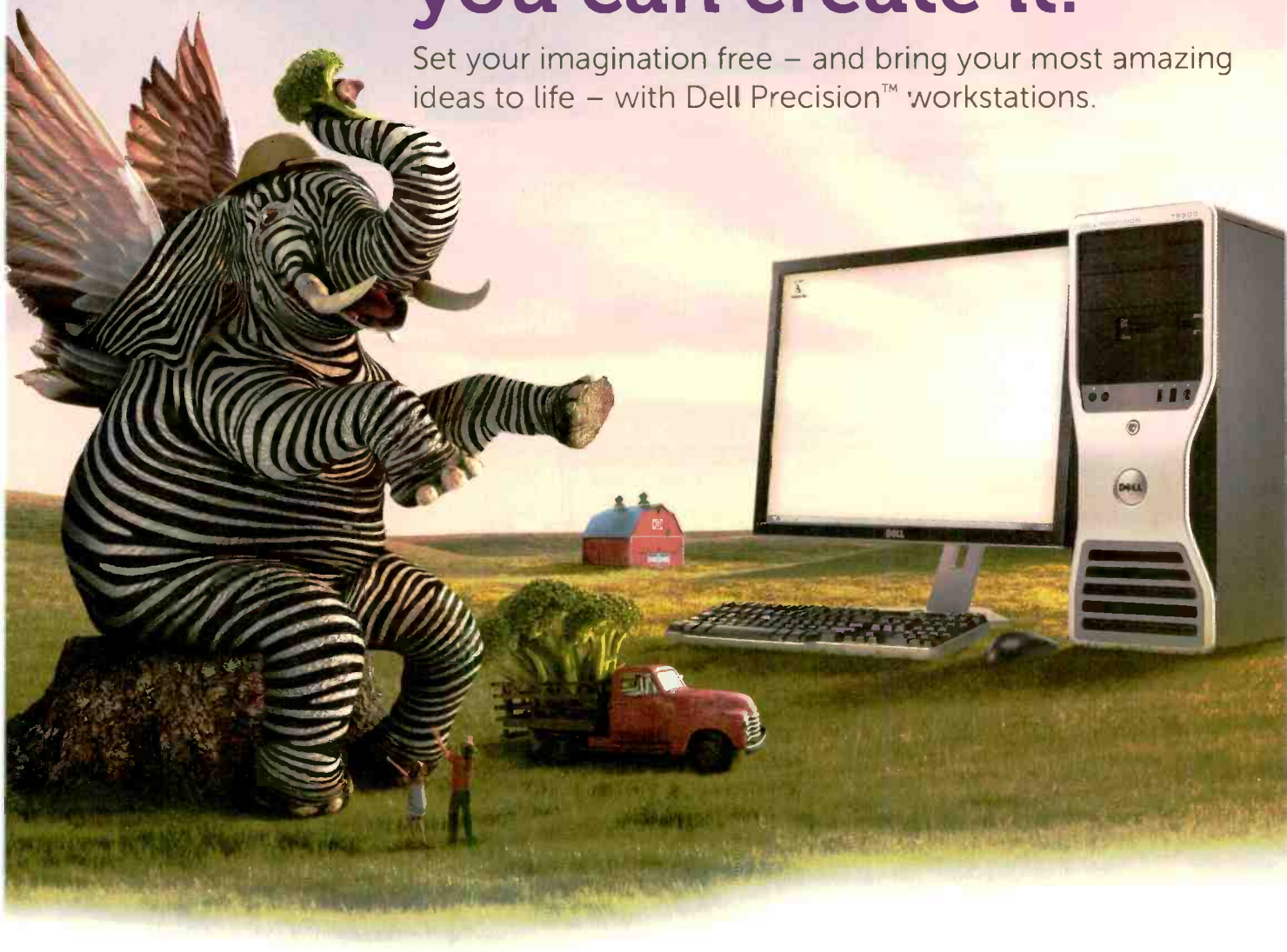
Matrix intercoms

Matrix intercoms are becoming more prevalent these days. Their flexibility has made them quite popular with larger, more sophisticated power users. They employ four-wire technology (the simplest of communication circuits), and can interface with POTS telephones and standard audio paths, both digital and analog. One of their biggest benefits is that they enable point-to-point communications, allowing numerous private conversations within the system. In addition, the matrix architecture can accommodate many new fiber and IP interfaces and no shortage of useful VoIP and VoIP-like solutions, making it possible to use the system to talk

Windows.® Life without Walls.™ Dell recommends Windows 7.

If you can imagine it, you can create it.

Set your imagination free – and bring your most amazing ideas to life – with Dell Precision™ workstations.



In the studio and now on the road, you have the power to keep up with your ideas and stay on top of your schedule.

- Speed your way through the most complex tasks with powerful multi-core processors.
- Collaborate, multitask, render and more – with a system ISV-certified to run 90 applications including Autodesk® Maya® 2011, Autodesk® 3ds Max® and Adobe® CS5.
- Keep your software and hardware working seamlessly with optional Dell ProSupport™* – your single point of contact to over 75 software vendors – for fast, efficient problem resolution.

Learn More ▸

Call 1-866-306-3355 or visit www.dell.com/smb/imagine

Windows® 7 Professional

Windows® 7 Professional operating system makes the things you do every day faster and easier. With fewer clicks, faster searching, easier browsing, and simpler ways to connect, there's less between you and what you want to do.

*Availability and terms of Dell Services vary by region. For more information, visit www.dell.com/servicedescriptions

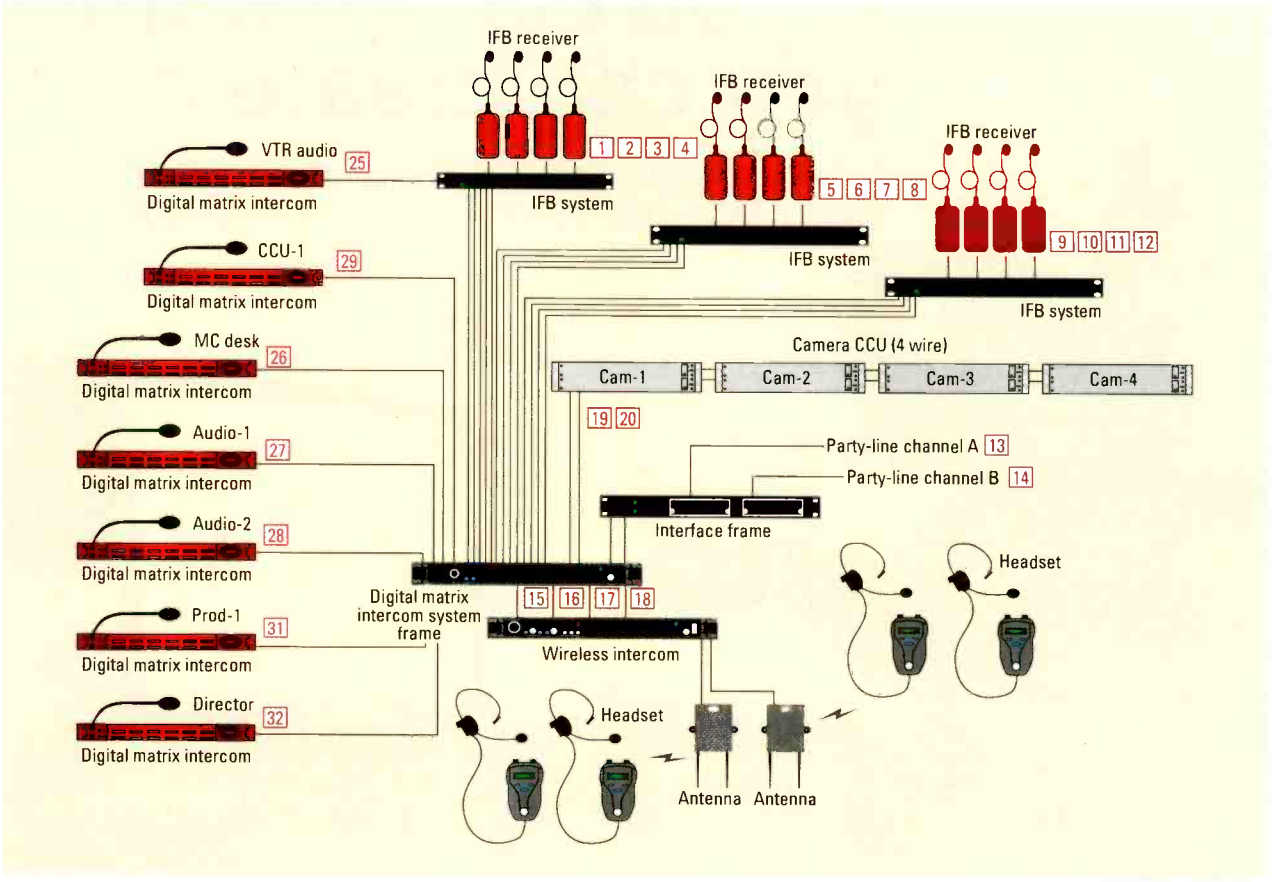


Figure 2. A matrix system with a wireless component

not just within one facility, but across thousands of miles. If your operation handles a lot of breaking news from remote locations, many matrix intercoms can allow reporters and other staff members to access the intercom from a laptop interface, even if they are located thousands of miles away from the home studio.

Wireless intercoms

A third category of intercom systems is wireless. (See Figure 2.) Because of their inherent mobility, most broadcast and post houses use wireless intercoms, often in conjunction with a matrix or party-line system. The main things to consider when choosing a wireless intercom system is how well it will work with your facility's fixed intercom, how well it deals with RF interference, especially in environments with a large number of different wireless systems (such as a sporting event), and the frequency band on which it operates. There is a lot of UHF space available today, but because of changes by the FCC, most will no longer be accessible for intercoms in the future. Always insist on a test at the site before you buy. Look at wireless intercoms that operate at higher frequencies so you don't get an unwanted surprise when the FCC pulls the switch — as it did with 700MHz.

Look at wireless intercoms that operate at higher frequencies so you don't get an unwanted surprise when the FCC pulls the switch.

Conclusion

Once you've followed the two steps outlined thus far, you will be primed to start step three, which is researching intercom manufacturers' products. Now that you have a clear idea of your facility's communications needs, compare them with the features each intercom offers. No doubt, you will find the right match. BE

Ed Fitzgerald is director of customer satisfaction at Clear-Com.

The Power To Brand & Control

When It Comes to Power and Control, Go With the Masters

The Utah Scientific MC family are the masters of master control systems. Proven in all types of television applications – from single channel management to commanding the complexities of large-scale, multichannel, multformat operations – they handle SD, HD, or both simultaneously, while directing multiple mixed format audio sources if necessary.

Utah Master Control systems offer seamless integration with Utah's industry-leading routing systems, full compatibility with all major automation systems, and advanced intelligent handling of EAS alerts. Add to all of that its complete channel branding capability – including multiple keys, logos, squeeze-back and graphics – and you're not just in control, *you rule.*

Contact us at: info@utahscientific.com, or call (800) 453-8782.

The Best In The Business

www.utahscientific.com

10 Year WARRANTY

Utah Scientific

Measuring spectrum

The Senate seeks a spectrum inventory, but with a kick.

BY HARRY C. MARTIN

Sens. John Kerry and Olympia Snowe have introduced a new version of last year's spectrum inventory legislation. The new bill, S. 3610, entitled the "Spectrum Measurement and Policy Reform Act," was put in the hopper in mid-July. According to Kerry, the legislation "tasks the FCC and the National Telecommunications and Information Administration (NTIA) to perform much needed spectrum measurements to determine actual usage and occupancy rates" — in other words, much of what last year's version did.

But the new bill contains two provisions that have ominous implications for TV broadcasters. The bill calls for the sharing of spectrum auction proceeds — a harbinger of broadband-induced spectrum "repurposing" or seizure of over-the-air TV spectrum. And just as ominously, it proposes annual spectrum fees.

Dateline

- Noncommercial TV stations in Alaska, Hawaii, Oregon, Washington and the Pacific Islands must file their biennial ownership reports by Oct. 1.
- By Oct. 1, TV and Class A TV stations in the following locations must place their EEO public file reports in their files and post them on their websites: Alaska, Florida, Hawaii, Iowa, Missouri, Oregon, Puerto Rico, Washington, the Pacific Islands and the Virgin Islands.
- Oct. 1 is the deadline for TV stations in Alaska, Hawaii, Oregon, Washington and the Pacific Islands to electronically file their broadcast EEO midterm reports (Form 397) with the FCC.

The proposed law

On page 17, in Section 6(b)(2) of S. 3610, there are proposed amendments to the Communications Act to include the following provisions:

- *Auction revenue sharing plan.* Notwithstanding subparagraph (A), if the commission determines that it is consistent with the public interest in utilization of the spectrum for a licensee to relinquish some or all of its licensed spectrum usage rights in order to permit the assignment of new initial licenses or the allocation of spectrum for unlicensed use subject to new service rules, the proceeds from the use of a competitive bidding system under this subsection may be shared, in an amount or percentage determined in the discretion of the commission, with any licensee who agreed to participate in relinquishing such auction usage rights. (My emphasis added.)
- *Spectrum licensee fee.* In general, the commission shall have the authority to assess and collect from each licensee an annual fee for the spectrum assigned to such licensee that is based on the fair market commercial value of that spectrum and the public interest of the service the spectrum is being used for, using a methodology adopted by the commission, after providing notice and opportunity for public comment.

TV spectrum grab

The FCC's National Broadband Plan makes it clear that the agency would like to repurpose (seize) some 120MHz of spectrum from TV broadcasters and auction it off for mobile broadband use. To cushion the blow for broadcasters, the commission suggested that it might be willing to share a portion of the auction proceeds realized from sales of their spectrum. At this point, however, the FCC has no the authority to share the proceeds with anyone. The new legislation sponsored by Kerry and Snowe would provide that authority.

The bill would give the FCC complete discretion to dole out as much — or as little — of the auction proceeds as it sees fit. This and exactly who would be eligible to receive such proceeds would be worked out in an implementing rulemaking proceeding.

Spectrum fees

Unlike the annual regulatory fee that all FCC licensees already pay, which is based on covering the costs of the FCC's operations, a new spectrum fee would be imposed. This new fee would be calculated based on the "fair market value" of the licensed spectrum and the public interest value of the service using the spectrum. The FCC would determine both the fair market value and what the public interest values are.

While broadcasters can always make a strong argument about the value of the public service they provide, the problem is that the commission looks at broadcasting as an outmoded technology that needs to step aside for broadband. So, for instance, the FCC could conclude that broadband outweighs broadcast in terms of the public good and then set the value of broadcast spectrum using its perceived value to broadband providers. This could lead to confiscatory spectrum fees that could price broadcasters out of the market for their own spectrum. BE

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

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

Nucomm

RF CENTRAL

Enter the Era of MPEG4 Part 10 Solutions

The Next Generation of Microwave Link Systems from Nucomm & RF Central

Pro-Link HD Transmitter & Receiver

microLite HD Receiver

microLite HD Transmitter

Stx SD Transmitter

Mobile CMDR Handheld Receiver

VITEC GROUP Videocom Division

Visit us at IBC 2010, Stand 1.B31

Talk to our experts about our broadcast quality MPEG4 in industry lightest and smallest package.

+1 800.968.2666 | +1 908.852.3700

www.imt-solutions.com

Graphics and captioning

Two specifications enable mobile devices to shoulder the load.

BY ALDO CUGNINI

In the analog television world, graphics were generated at the production facility and inserted into the analog signal as part of the video. Captions were later added to the vertical interval, and this evolved into the digital captions available on digital transmission systems today. But the graphics portion has remained embedded in the video itself — until now. The evolution of mobile TV systems has brought about the development of several specifications aimed at bringing a rich multimedia experience to handheld devices. Both ATSC-M/H and DVB-H have incorporated specifications originally developed for the cellular telephone environment, enabling the compatible presentation of graphical elements across a wide range of devices.

Formed in June 2002, the Open Mobile Alliance (OMA) is a specification-writing organization focused on enabling interoperable mobile services across countries, operators and mobile terminals. The membership of the OMA includes nearly 200 companies representing the world's leading mobile operators, device and network suppliers, information technology companies, and content providers. Two key OMA specifications define a common toolkit for providing graphics to mobile devices: OMA Mobile Broadcast Services Enabler Suite (OMA-BCAST) provides an electronic service guide, and OMA Rich Media Environment (OMA-RME) provides a rich graphical multimedia experience. It should be noted that while the OMA is not a standards organization per se, its specifications are developed in a consensus-based activity that is carried out by its member companies. Thus, the specifications essentially carry the weight of standards, and there is careful attention to the evolution and backwards compatibility of the technical requirements. Both ATSC-M/H and DVB-H specify a service guide based on the OMA-BCAST Service Guide and graphics based on OMA-RME.

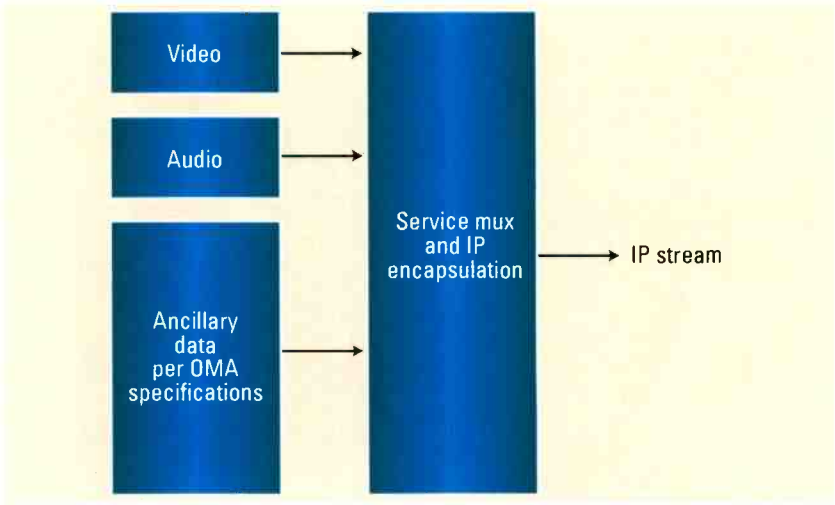


Figure 1. Mobile services are carried in an IP stream.

XML provides a standard way to convey data

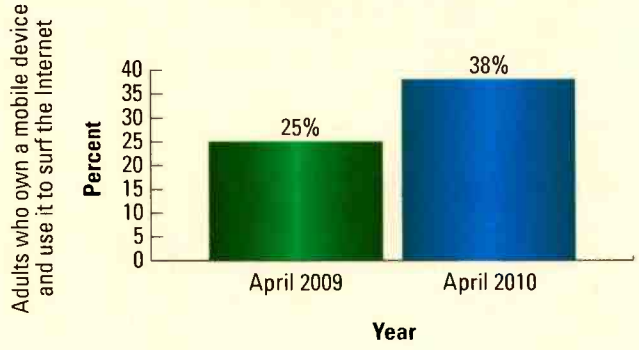
As with MPEG transport, descriptors are used to define the various elements of both OMA-BCAST and OMA-RME. However, the various mobile broadcast schemes have now moved toward an IP-based transport mechanism. As such, the OMA-based data descriptors are relayed by using XML, which provides a standard (and IP-friendly) way to define a data set. (See Figure 1.)

FRAME GRAB

A look at tomorrow's technology

Number if Americans accessing mobile Internet increasing

Today, 38 percent of Americans with a mobile device use it to surf the Internet.

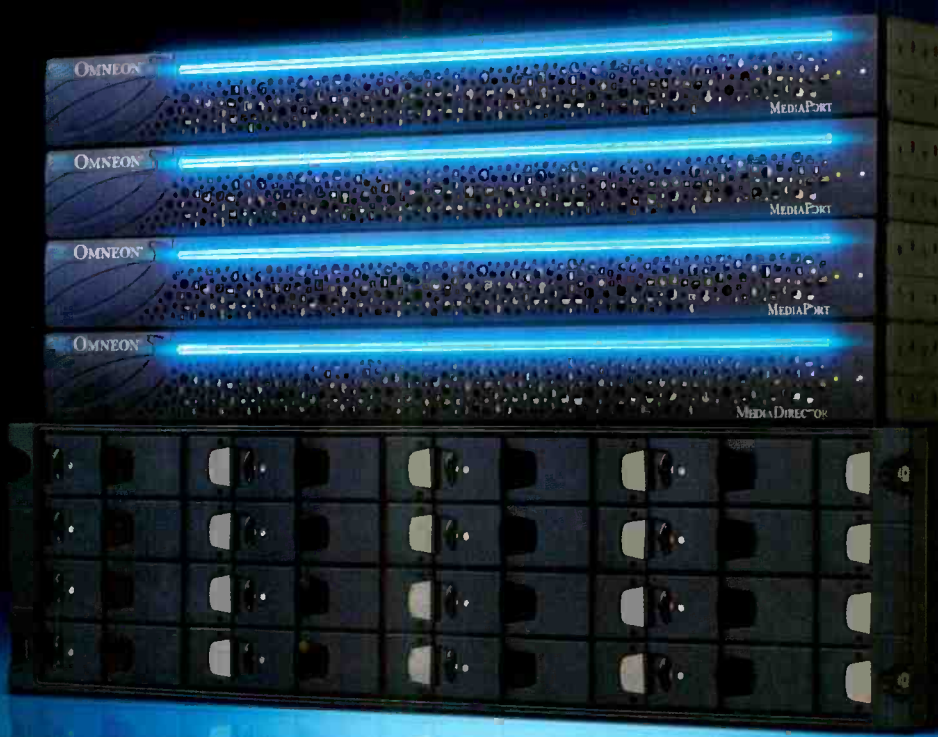


Source: Pew Internet and American Life Project

www.pewinternet.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!**

w w w . o m n e o n . c o m

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

OMNEON®

Active Storage for Digital Content

```
<?xml version="1.0" encoding="ISO-8859-1"?>
   <tv>
      <program channel="TVNetwork1"
      start="20101230002000 -0500" stop="20101230022000 -0500">
         <title>Toy Story 3</title>
         <desc>Woody, Buzz and the rest of their toy-box friends are dumped in a
         day-care center after their owner, Andy, departs for college.</desc>
         <date>2010</date>
         <category>Animation</category>
         <category>Comedy</category>
         <rating system="MPAA">
         <value>G</value>
         </rating>
      </program>
   </tv>
```

Figure 2. XML provides human-readable data for mobile broadcasts.

Being an open standard, XML has gained popularity in the Internet world; one well-known data language based on XML is RSS, used to automatically feed Web pages and content to a browser. One advantage of using XML is that an XML document is written in plain text, i.e., the data are inherently readable by humans. (See Figure 2.) Also, because the language is highly structured, it is straightforward to take a data set from multiple file formats, e.g., a TV broadcast schedule, and convert it into an XML file that can be transmitted to multiple entities, including a receiving device. In addition, the textual nature of XML makes it inherently amenable to compression for storage and transmission purposes. The receiver will not display this data exactly as shown, of course, but will parse the data and use it to generate a user-friendly electronic service guide.

A number of data "fragments" can be defined by means of OMA-BCAST, using XML schema. The description of services, schedule and content all apply to a service guide, while access, session and provisioning can apply to the way content is controlled, such as free or pay, limited viewing times and purchasing of or subscription to content and services.

Electronic service guides can be customized

The various standards describe how to send a service guide over the broadcast transmission stream. All or part of the service guide can also be sent on an out-of-band interaction channel, and there are elements in OMA-BCAST to indicate to the receiver which portions of the guide are available using an alternative access URL. This presents some interesting options to the service providers in that custom service guides can be delivered to individualized receivers.

OMA-RME provides graphical functionality by integrating a number

of standardized elements, including the Scalable Vector Graphics (SVG) language for graphical object creation and ECMAScript for script support. RME content consists of scenes of objects such as video, images, animation, text and audio that are composed together. By defining each object separately, the presentation can follow scripts that control how each object appears, disappears and animates. In addition to providing creative flexibility, this minimizes both transmission bandwidth and device processing power, as updates are needed only for new objects or animations.

SVG, which is an open standard, is an alternative to the JPEG or GIF formats, and it provides a way to generate and render both static and dynamic (animated) graphical elements on display devices; most current Web browsers support SVG directly. As the name suggests, objects can be scaled (resized or resampled) easily to different presentation resolutions without aliasing or other artifacts. Thus, its use is amenable to devices where there will be a wide range of display resolutions.

Like MPEG, SVG is defined with multiple profiles; in fact, MPEG-4 Part 20 (Lightweight Application Scene Representation or LASeR) is based on a profile of SVG 1.1 called SVG Tiny (SVGT). SVGT was defined with mobile phones as the target application, so it is limited to the horsepower and graphical constraints of small battery-powered devices. A higher-performance profile, SVG Basic, extends capabilities to devices such as PDAs.

ECMAScript is a standardized version of JavaScript, which was developed by Sun Microsystems as a structured programming language. It enables Web applications to have a compact environment in which they can run computationally intensive programs, scripts and the like. As an example, a graphical applet can be designed using SVG and ECMAScript to render a functioning calculator on a mobile video device. Similarly, the formatting, scripting and timing of scene descriptions, content rendering and user interface graphical elements can all be defined in a creative and distinctive manner.

There are multiple ways to distribute captions

Captions transmitted in ATSC A/153, as described in CEA-708, can be carried using descriptors as defined in ATSC A/65, constrained as per ATSC A/72. The captions are listed — together with video, audio and other services — in the Service Map Table, or SMT-MH. Captions could also be carried by other means. DVB-H IP Datacasing Electronic Service Guide (ESG) Implementation Guideline A112 describes how captions can be carried within the ESG of that type of transmission. Captions could be carried similarly in the ESG or other auxiliary elements of an ATSC-M/H transmission by using the framework of OMA-RME.

These technologies continue to remind us that the processing power of handheld devices has progressed so far that it is now practical to depend on the devices to render some pretty complex graphics — something that formerly could only be done at the production or transmission side. As broadcasters ramp up mobile services, it is increasingly important to keep abreast of the state of the art in consumer devices to maximize the opportunities for content development and distribution. BE

Aldo Cugnini is a consultant in the digital television industry.

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

IP technology for sports

Broadcasters use IP technology to deliver sports programming to fans.

BY BRAD GILMER

It will not come as any surprise to you that the world of broadcasting is changing quickly. One of the drivers behind these changes is the development of IP video technologies. While IP video is providing challenges, it also opens up opportunities for broadcasters. One such opportunity is televising sporting events that might not normally be covered by professional broadcasters.

Describing the need

Every weekend there are hundreds, perhaps thousands, of college sporting events taking place in the United States, but only a small fraction of these are nationally televised. While this is not a problem if you want to watch one of the major games, it is a real issue if your college is not in contention for a title or if your favorite sport is not a popular one. In the past, you would be out of luck. But recently, broadcasters have teamed up with sporting organizations to bring these events to your home using some unconventional methods.

The goal of many of these partnerships is to create a professional sports product that can be watched at the home or office using the Internet.

In addition to these user requirements, other issues must be considered:

- Many if not all university venues have high-bandwidth IP connectivity available.
- People are on-site and available to operate these facilities.
- Universities generally support the idea of making sporting events more available to their students, faculty and alumni.

While IP video is providing challenges, it also opens up opportunities for broadcasters. One such opportunity is televising sporting events that might not normally be covered by professional broadcasters.

The Big Ten Network uses a remote live interview system. Photo courtesy Mike Wilken of Big Ten Network and Joe Caffaro of FOX television.

These broadcasts do not have anything like the usual budgets for national sporting events, and therefore, the technical solutions developed must be cost-effective.

The process of providing relatively inexpensive cameras and switching equipment at a venue and bringing this signal back to a central distribution point is relatively straightforward. Also, several well-known commercial platforms exist for Internet distribution of streaming video. However, one particular component of sports production, the live interview, is quite challenging. But given cost constraints, innovative solutions are required. Here are some typical user requirements for this application:

- Live bidirectional transmission;
- Point-to-multipoint capability;
- Available for use at all times;
- Centralized remote control capability;
- Ability to add/remove links as necessary; and
- Central monitoring at the network operations center.

But let's consider these points in more detail. Regarding the first point, high-speed IP connectivity is generally much more available in the university environment than in the general business environment. But tailoring this connectivity to the requirements of broadcast TV can be difficult. Second, while it is true that highly enthusiastic people may offer to operate college broadcast facilities, generally speaking, their enthusiasm is higher than their technical knowledge, making it critical to either provide remote control capability or to make the operation of the equipment standardized and simple. Finally, universities may support these efforts, but funding can be limited.

The transmission medium and the equipment

When it comes to linking universities to the production facility, three choices are generally considered — dark fiber,

More Than Just I/O

Faster H.264 file delivery for Blu-ray, the web, and mobile devices

matrox MXO2 Family

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 Solutions

satellite or compressed video over IP. While dark fiber provides excellent connectivity, this sort of connectivity is not typically available to connect a university to a remote production facility. Satellite transmission is well-known to the professional broadcaster, but it has limitations that make it unsuitable in this implementation. For example, satellite is not always on; satellite ground stations require users to get roof rights for permanent dishes, which can be tricky; and satellite can be cost-prohibitive. This leaves compressed video over IP.

Compressed video over IP is a good choice for the live interview situation for several reasons. As noted above, IP connectivity typically already exists, it is always available, and it is low latency.

That said, providing sufficient quality of service (QoS) for these interviews can be challenging in a campus environment. The industry has done a good job of developing standards around the transmission of MPEG-compressed video over IP networks. The SMPTE 2022 family of standards provides mapping and FEC protection for MPEG streams. But even with these standards, it is likely that connectivity between the universities and production facilities must be over dedicated networks. This is because the QoS provided over the ubiquitous Internet is not high enough for live interview situations.

Interestingly, quality is only one of the issues at work here. In order to maintain an acceptable level of quality at the viewer, typical Internet video applications employ FEC or other error correction methods that require significant amounts of latency. This latency is unacceptable in a live interview situation. Dedicated links are required, not just so that the picture quality is acceptable, but also so that the latency of the video path is acceptable. Again, the easiest solution is to allocate dedicated T1 circuits between the campus and the television production facility. While this requires some network engineering, creating T1 circuits between venues is well understood.

Standardized equipment configuration is key

Having a standardized equipment package at each interview location is critical for support and for remote operations. These packages typically include two-way video and audio (similar to video conferencing setups), with remote control cameras that can be controlled at the production facility. But the equipment configuration goes far beyond conventional video conferencing. Here are

some other requirements for these remote venues:

- IFB audio;
- Pro microphone audio;
- PBX access (extension of studio telephone system);
- Studio lighting and HVAC control (optional);
- Access to show rundown system (optional);
- Prompter (optional); and
- Camera robotics control (optional).

Items such as IFB and professional microphone audio are clear, but other items on this list need some explanation. In most studio applications, having a remote location as an extension on the studio phone system can be an extremely useful tool for event coordination. This is an often overlooked, but easy to implement feature for remote interview applications, especially with IP-based phone systems.

Another feature that is easy to implement but frequently overlooked is remote control of interview studio lighting and HVAC. Being able to turn on studio lights and air-conditioning from a production studio allows the production crew to have the facility up and ready for an interview as soon as personnel arrive. In some cases, this can mean the difference between getting an interview and losing the opportunity because the interviewee does not have time to wait around while the technical crew gets the space ready for use. Furthermore, being able to cool the room down ahead of the interview may avoid excessive heat in the room if the air-conditioning gets behind the lighting heat at the beginning of the interview.

Remote access to the show rundown system, prompter and camera robotics control are other optional features that may not be employed in this particular scenario, but may be employed in other remote studio interview applications.

Space does not allow me to talk about how these shows are integrated and transmitted. Briefly, live interviews are integrated in a production facility, and shows are then streamed to the Internet using any one of a number of commercial products. Typically, these shows are part of a larger Web presence that may make available past games, interviews and many other items related to the sporting event being covered. To see an example of this sort of technology at work, view the Big Ten Network at *www.bigtennetwork.com*. BE

Brad Gilmer is president of Gilmer & Associates and executive director of the Advanced Media Workflow Association.

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

Streaming live ENG

Wireless technology and simple encoding appliances enable reporters to stream live news coverage.

BY BEN LARSON

It's the age of immediacy for global newsgathering. Viewer expectations have never been higher for up-to-the-minute reporting direct from the source of breaking news, which puts additional pressure on media companies to get the story before their competition. The traditional approach to securing coverage from a remote location has been to roll a truck, with all of the expenses and complexity that go along with it. Not only is a mobile satellite vehicle expensive to maintain and operate (factoring in satellite uplinking costs), but it requires the presence of a trained technical crew. In some cases, a vehicle might be physically incapable of getting to the story location.

Fortunately, the increasing availability of low-cost wireless technologies and IP networks offers new options for remote and live newsgathering. Armed with a video camera, a simple encoding appliance or IP encoding software loaded onto a PC or smart phone, and an Internet connection, a reporter can stream live video to the newsroom in a matter of minutes.

Jeff Liebman of WDIV-TV in Detroit uses Streambox software and a camera mounted to the windshield of his car to send live video back to the station.

It's all about the codec

The heart of any effective streaming video solution is the codec, which compresses video and audio from a camera into IP data packets for efficient transport over the Internet or an IP network, and then decodes the packets back into video on the other end. Therefore, the quality of the codec should be the first consideration when evaluating a hardware- or software-based encoding/decoding solution for IP streaming. At the most basic level, the codec should deliver the best quality possible and reliability at low delay while scaling over multiple data rates to ensure quality transmission and playout of both HD and SD video streams.

Look for a codec system that uses discrete cosine transform (DCT) compression while supporting metadata encapsulation. Some codecs may use the high-delay TCP/IP transmission protocol. Others may rely on the faster UDP protocol. Also, look for good bandwidth management. Unrestricted

On the decoding side, a streaming codec should include scaling algorithms, which can improve the image quality of low-resolution video.

www.aja.com

Route it. Convert it.
Connect with AJA.

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

KUMO

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.

SDI - at the speed of light...

FiDO

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

compression will rapidly consume bandwidth, so be sure the encoder provides a constrained variable bit rate (CVB) that enables the user to determine the maximum bandwidth to be consumed. Encoding software should also support a wide variety of field devices, including laptops and mobile phones.

Of course, video quality and latency are prime considerations for any IP streaming solution. One quick indication of the codec's quality standard is the shape of the pixels. Determine if the codec is optimized for broadcast-quality viewing or for viewing on a computer (in which case the pixels are more square). Also, ask how the codec handles adverse networking conditions; does it macro block or does it handle networking glitches gracefully by reducing resolution? An encoder should include forward error correction (FEC).

Michael Trapp from Realnature.tv sends live video from Neumayer Station in Antarctica to Germany using Streambox software.

On the decoding side, the codec should include scaling algorithms, which can improve the image quality of low-resolution video. Another desirable decoder feature is a jitter buffer, which manages the common network occurrence in which packets arrive out of order (most

typically seen over wireless networks) by queuing up and then rearranging the order of the packets.

Network considerations

IP streaming technology enables field reporters to take advantage of whatever network resources might be available at a given remote location. This means that even a low-data-rate IP network can enable the transmission, whether it's a hotel's Wi-Fi, a dedicated T1 or E1 line, or local area network. Now that 3G and 4G cellular networks are becoming more common in major cities around the world, a laptop equipped with a 3G/4G air card is often all that's needed to transport broadcast-quality video.

Even a low-data-rate IP network, such as a hotel's Wi-Fi network, can enable a remote transmission.

Some sophisticated encoders support mobile 3G/4G bonding, which enables users to bond two or more cellular data cards for wireless IP access. This can increase the available bandwidth up to 1.5Mb/s or more, making it possible to stream HD video in 720p or 1080i. Another popular option is a connection via a mobile satellite data terminal such as BGAN, with which a news crew can literally send video from anywhere on the planet. A minimum network speed for SD is 64kb/s; for HD it is 500kb/s.

Live versus store-and-forward streaming

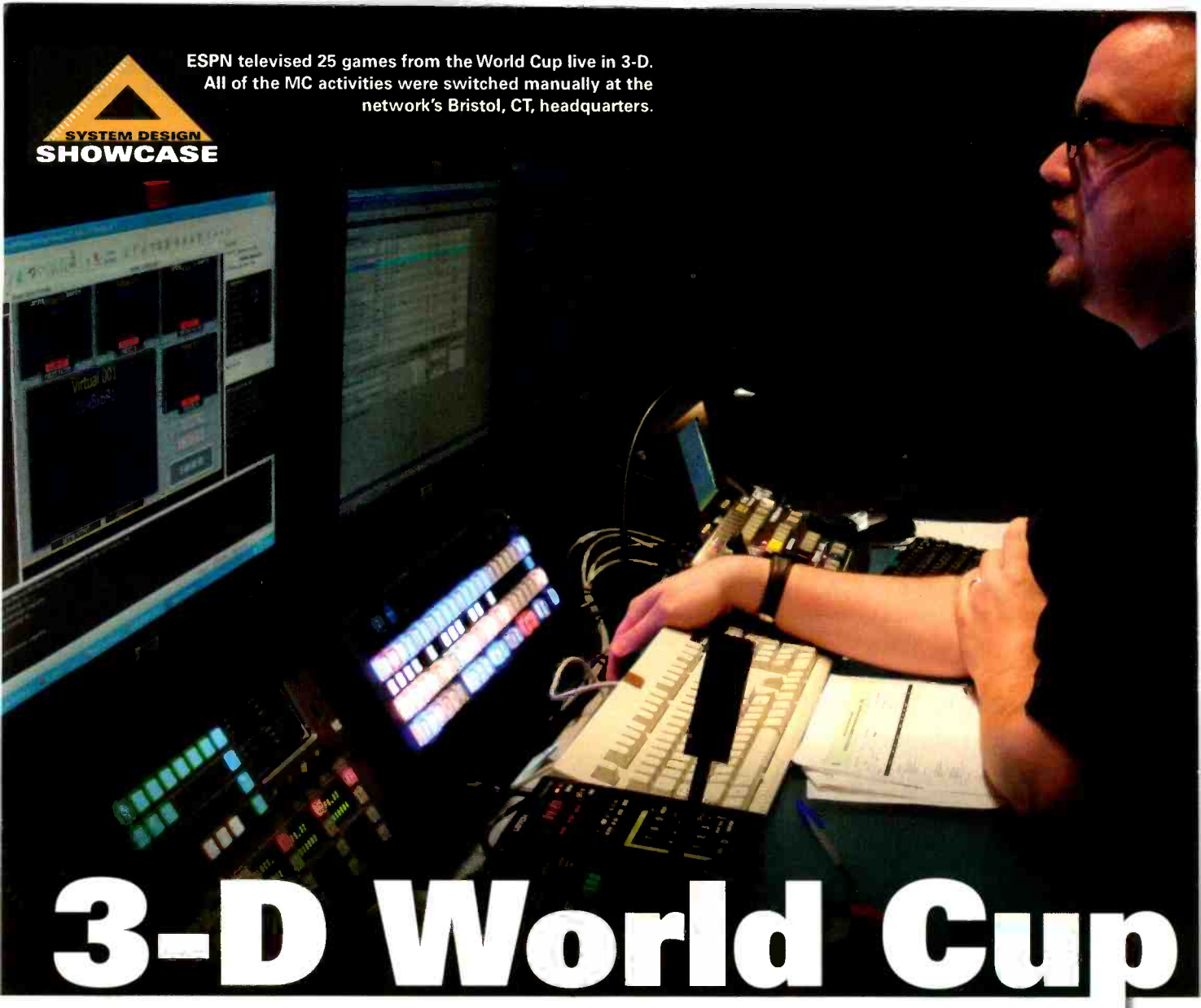
Some production applications require on-site editing. This may require a store-and-forward capability. Here, the video may need to be exported to an edit platform, in 4:2:0 or 4:2:2 color for SD and HD. Be sure the encoder is capable of fast performance if you need this function.

The edited files can then be sent back to the studio at much higher bit rates than live video. However, the file size increases with the bit rate, requiring more bandwidth and sometimes slowing upload times.

Although your crews may never need to transmit live video from the top of Mount Everest as one team of climbers recently did, news staffs everywhere sometimes need to transmit from rugged and physically difficult locations. Next-generation encoding solutions for streaming video over IP networks offer highly effective solutions to this challenge. **BE**

Ben Larson is a project manager for Streambox.

SYSTEM DESIGN SHOWCASE



ESPN televised 25 games from the World Cup live in 3-D. All of the MC activities were switched manually at the network's Bristol, CT, headquarters.

3-D World Cup

ESPN experiments with 3-D MCR in its technology lab.

BY MICHAEL GROTTICELLI

As ESPN viewers around the country watched the World Cup matches live from South Africa in stereoscopic 3-D, a master control operator sitting in a small room in Building 13 at the sports network's Bristol, CT, campus electronically inserted 3-D commercials and other graphic elements manually to enhance the broadcasts. It was nothing fancy; it just worked.

Televising one game in 3-D most days of the four-week tournament (for a total of 25 games in 3-D), ESPN accepted live 1080i HD feeds via a dedicated fiber line, with satellite backup, from the FIFA World Cup host broadcaster HBS and used a Pixel Power BrandMaster 3-DS MC switcher and Abekas Mira server (controlled by a DNF Controls control panel) before sending the game out to the various satellite and cable carriage partners.

Jonathan Pannaman, senior director of engineering at ESPN, said the system is part of ESPN's 3-D technology lab, where the company is testing a variety of equipment for future use. The switcher is part of that evaluation and testing process, and served as a temporary solution for the World Cup.

He said that as ESPN gets more into 3-D for the long term, a permanent MC suite would be established in another part of the campus for other 3-D broadcasts that the network will deliver.

3-D MC: A work in progress

ESPN is still deciding on the most cost-efficient way to perform MC operations for 3-D. MC operations (commercials and graphics insertion) for other ESPN 3-D telecasts, such as the recent MLB Home Run Derby, have been accomplished onboard a mobile production truck (provided by Game Creek Video or NEP Productions) on-site.

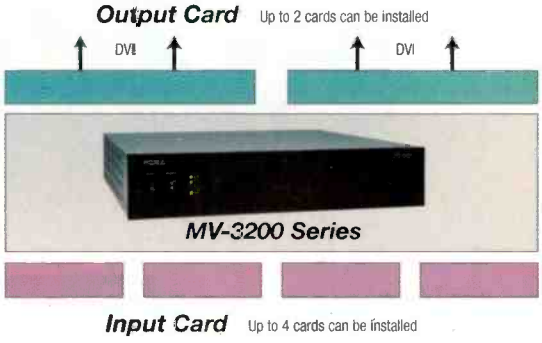
Pannaman said inserting ads on-site simplified the process. However, the network will continue to test and investigate how to make the best use of the system in the future.

The system's template-based graphics architecture made it easy for the MC operators to generate all of the

FOR.A®
INNOVATIONS IN VIDEO and AUDIO TECHNOLOGY

MV-3200 Series: All You Need in A Practical, Reliable Multiviewer

- Up to 32 windows with full layout control
- Dual head or Quad head, DVI output
- Dynamic UMD titling support
- Video over IP output
- Full Audio support, including monitor output
- LTC-controlled clocks with up/down counters
- Optional HD-SDI output also available



A complete line of multiviewers from our affordable quad viewer up to our new HD/SD/Analog/PC mixed 32-split model.

www.for-a.com

- Head Office (Japan)
  Tel: -81 (0)3-3446-3936
- USA Western (CA)
  Tel: -1 714-894-3311
- USA Eastern & Midwest (NJ)
  Tel: -1 201-944-1120
- USA Southern (FL)
  Tel: -1 305-931-1700
- Latin America & Caribbean (FL)
  Tel: -1 305-931-1700
- Canada (Toronto)
  Tel: -1 416-977-0343
- UK (London)
  Tel: +44 (0)20-8391-7979
- Italy (Milan)
  Tel: +39 039-881-086/103
- Korea (Seoul)
  Tel: +82 (0)2-2637-0761
- China (Beijing)
  Tel: +86 (0)10-8721-6023

The MC switcher's Video Switch Panel features a series of dedicated program preset rows that help identify sources.

Technology at work

Abekas Mira server
DNF Controls control panel
Pixel Power BrandMaster 3-DS MC switcher

Design team

Jonathan Pannaman, ESPN sr. dir. of eng.

World Cup graphics created in Bristol. These w
to the existing set of graphics created and added
Africa by the host broadcaster.

Desert preview

The BrandMaster 3D-S MC switcher was introduced
Pixel Power at NAB in April. Pannaman and a few colleagu
saw a demo of the system and found the features, ease of use
and 3-D image quality offered by the company's 3-D Clarity
character generator and MC system notable.

The 3-D version includes a dedicated MC hardware

panel (the Video Switch Panel) with dedicated program preset rows. A series of legend rows help identify sources coming from the router, and a row of TFT displays at the top can show images of graphic and video assets on a particular button before the operator cues them up. These can be configured to show the exact effect or associated move.

The system is 3RU in height, making it ideally suited to playout and production environments with limited spaces. It also can be used to remap all MC interfaces, signals and displays to a channel with the press of a single button.

A little MC goes a long way

In Bristol, the system is set up with the interface screen above the hardware panel, showing audio meters that are used to monitor and adjust levels on preview and program streams. There are also controls to adjust the depth of the stereoscopic images, which can be customized in different ways.

During the World Cup games, two operators worked in shifts to operate the system manually. There was no automation employed. They would come out of commercial breaks through the system and dissolve to the server to roll the commercials, using a control panel.

ESPN televised one game each day. Between games, it had a loop of 3-D graphics coming off the server, which displayed graphics, text and audio from the MC system to promote the next game.

The operators also used a Pixel Power Management console to edit template-based graphics within the MC system on the fly when necessary. Most graphics were built before the game started. This was done by simply double-clicking on a selected graphic. The system displayed the graphic full screen to allow the operator to preview his changes. A "Field" feature within the MC system then allowed the operator to edit every field within that frame, without having any knowledge of how to create graphics. Once the operator finished making changes, it was automatically "published" to the system for output into the final program stream in the correct aspect ratio, 3-D image convergence, resolution and font style.

More 3-D graphics to come

The World Cup was broadcast in 1080i (a first for ESPN) because that was the format provided by the host broadcaster. Since then, Pixel Power engineers have converted the unit to 720p via a software change on the system, so it's ready to take on more productions.

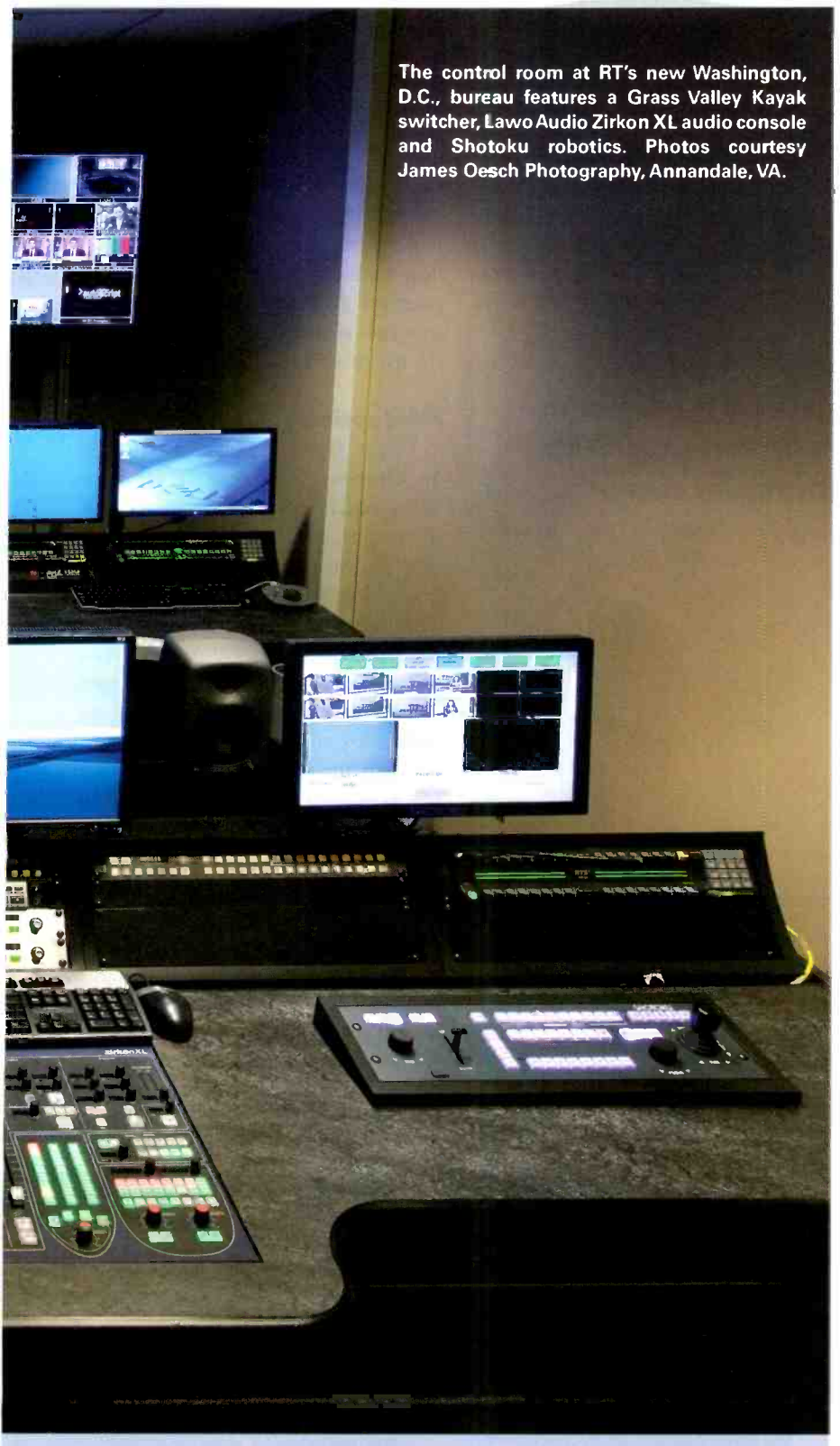
Pannaman said ESPN was happy with the way the World Cup went and how the MC system performed. There's an ongoing discussion about incorporating it in upcoming 3-D telecasts.

The system proved to be easy for nontechnical people to operate, which is a big plus for any broadcaster that uses a myriad of crews. BE

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

SYSTEM DESIGN
SHOWCASE

RT



The control room at RT's new Washington, D.C., bureau features a Grass Valley Kayak switcher, Lawo Audio Zirkon XL audio console and Shotoku robotics. Photos courtesy James Oesch Photography, Annandale, VA.

adds Washington, D.C., bureau to its international coverage

BY SCOTT BUCHHOLZ

RT, an international provider of broadcast programming to a worldwide audience, has extended its reach by creating a state-of-the-art bureau in the heart of Washington, D.C. Through the broadcaster's Moscow-based headquarters, the D.C. operations work in tandem with the already established bureaus in London, Paris, Tel Aviv and Tskhinval.

Providing a vast array of globally-oriented English-language programming choices, RT has positioned itself as a leader in network growth. Covering news events, politics, finance, world affairs, technology and travel, it has captured the attention of an ever-expanding audience.

Going digital in D.C.

While considering a Washington, D.C.-based bureau, RT weighed the benefits of using the services of a systems integrator and selected Azzurro Systems Integration to design and build a turnkey system within a limited timeline. Azzurro was tasked with transitioning the antiquated analog-based facility into a completely digital workflow while maintaining the broadcaster's ability to produce daily live programming. The resulting facility design required that all programming material be acquired, produced and distributed in a native digital format.

The D.C. operations work in tandem with the already established bureaus in London, Paris, Tel Aviv and Tskhinval.

RT's requirements included a comprehensive set of services comprising a conceptual plan, detailed design, budgeting, equipment procurement, scheduling, project management and system integration, with an emphasis

on maintaining maximum efficiency throughout all phases of project development.

Enlisting leaders in the creation, storage and management of digital assets, a best-in-class approach toward the development of the facility was created. Elements were designed to accommodate the creation of programming content using either of two studios and independent control rooms, ENG capabilities where local news events can be captured, and editing tools for creating and packaging program elements. Customization of program elements is enabled through the use of a powerful graphics engine.

The architecture allows for future growth through the ability to expand upon the existing servers, rather than the need for system replacement.

Technology at work

Apple Final Cut Pro
Autoscript TFT17HB-BLW prompters
Dalet
- Enterprise Edition automation system
- MediaCutter editing module

Evertz VIP-X multiviewers
Grass Valley
- Kayak HD 300 production switcher
- Trinix routing switcher

Front Porch Digital DIVArchive content storage management
Fujinon
- ZA17x7.6BZD full servo lenses
- ZA12X4.5BZD wide angle full servo lenses
- ZA17X7.6BERM lenses for ENG systems

Harris Videotek VTM-4100 waveform monitors
Ikegami HDK-79EXII cameras
Jimmy Jab extension
Lawo
- Nova 17 matrix controller
- Zirkon XL audio mixing console

Lectrosonics
- IFBT4 wireless base station
- IFBR1A beltpack IFB receivers

Omneon
- NetApp servers
- Spectrum media server

Panasonic TH-103PF10UL 103in 1080P HD plasma
Planar Clarity Margay II DLP displays
RTS Cronus intercom
Samsung LN65B650X1FX LCD monitors
Shotoku TG-18 robotic/manual pan and tilt heads
Sony
- PDW-700 camcorders
- XDCAM recorders

Sun StorageTek LTO archive
Telestrator presentation software
U-Touch touch-screen overlay
Vinten Osprey pedestals
Vizrt Trio triple channel and Artist graphics

Production

Under Dalet automation control, an Omneon Spectrum server provides nearline storage and playout of media assets. NetApp servers act as a central repository for core programming and interstitial material. Through the modular approach of the Spectrum and NetApp servers, Azzurro designed a system that met the exacting standards of RT. The architecture allows for future growth through the ability to expand upon the existing servers, rather than the need for system replacement.

With Spectrum being built upon open standards and published APIs, the broadcaster has the ability to choose from hundreds of applications, including the media asset management (MAM) system. Packaged within the MAM is the ability to automate and track all digital workflows within the facility. Through this system, RT maintains a centralized point

The facility houses five Final Cut Pro and Dalet MediaCutter editing suites.

Broadcast and Satellite Engineers:

Correct Audio Levels

Automatically and Easily

(Affordably, too.)

I arrived at the station and found another message from an unhappy viewer. He was complaining about sudden loud audio when we went to commercial and how he had to lunge for his remote. And then again when a new program came on. I'd been getting calls like this daily. Something had to change.

So, I decided to install the demo of the audio level control that Mondae from Ensemble Designs left for me. It was easy, no changing out cards or re-wiring was necessary. I just typed the serial number into my Avenue PC software. I was already using it to control embedders, frame syncs and HD upconverters anyway.

The viewer complaints stopped! We started using LevelTrack and immediately the complaints ended. Now we use LevelTrack AGC to automatically control audio levels for all of our channels.

LevelTrack™ made my life easier. It's a 'set it and forget it' solution. that automatically adjusts the overall audio level while nicely maintaining the internal dynamics of the program material. I love how LevelTrack controls audio levels with no further intervention. Plus, it's very affordable.

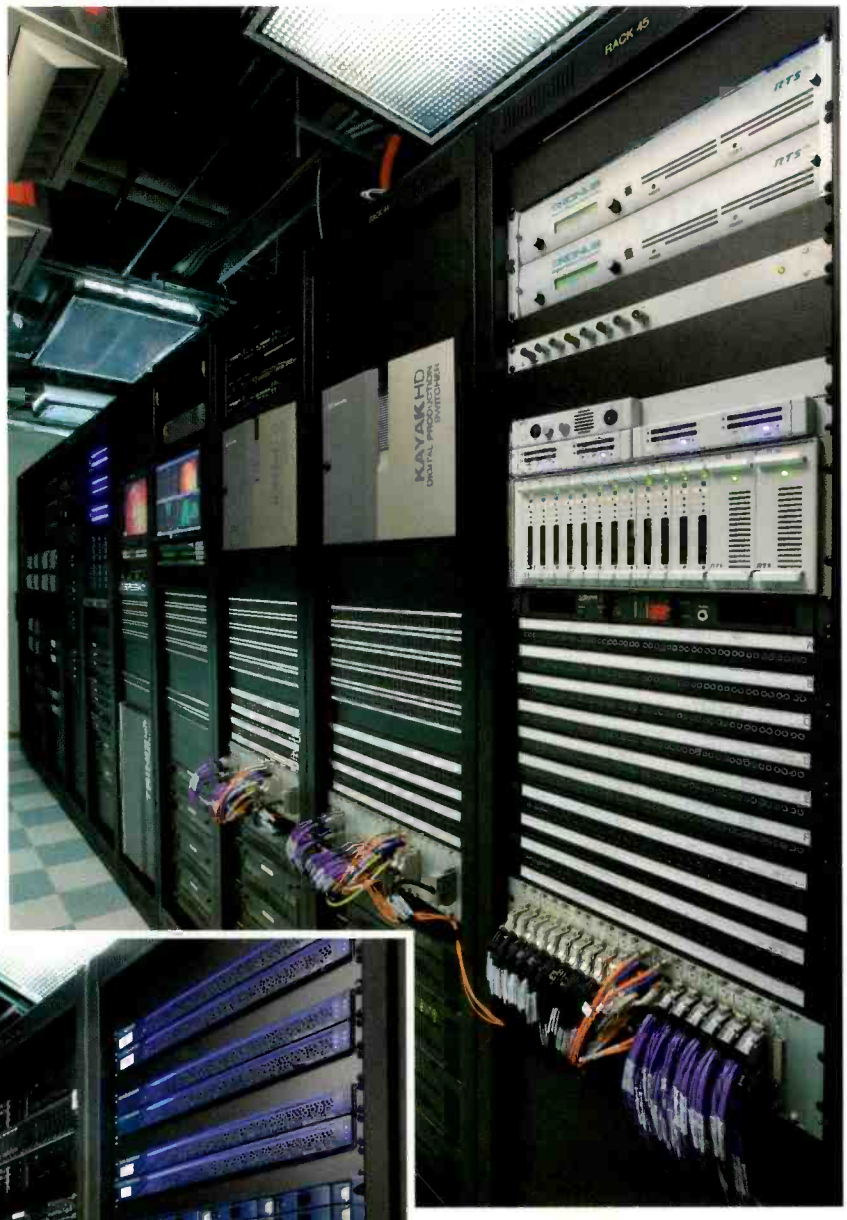
Life is certainly easier when the home viewers are happy. Try it for yourself.

Call today for your free 30-day trial of LevelTrack AGC **530.478.1830**

Purveyors of Fine Video Gear - Loved By Engineers Worldwide

ENSEMBLE
DESIGNS

See you at IBC Stand 8-B91
www.ensembledesigns.com



Two digital control rooms feature equipment and patching, (shown above) and Omneon and Dalet servers (shown left).

of control for all production requirements under a common application.

A Sun StorageTek LTO tape-based archive provides protection and long-term storage of core media assets. Enabling the efficient management of media to and from the archive is Front Porch Digital's DIVArchiveapplication.

The two digital control rooms employ the latest technology to create the unparalleled production elements associated with the RT broadcast. Considering the system requirements, the broadcaster selected a Grass Valley Kayak production switcher that includes SD/HD formats, 72 digital inputs and 36 digital outputs. Additionally, three mix/effect buses each provide two DVEs and two keyers. Finishing off the switcher are two clip players. A Grass Valley 256 x 256 Trinix HD/SD-SDI router with production switcher control provides flexibility to the available Kayak inputs and acts as the core router for the facility.

Each of the two control rooms contains a Lawo Zirkon XL audio mixing board. The use of a common Nova 17 matrix controller makes all sources available to either mixer. The matrix allows for 64 AES and 48 analog sources to appear in control rooms independently or simultaneously, without the need for extended wiring. Streamlining the facility elements was the key to maximizing the available technical resources and therefore containing overall costs.

A six-channel Vizrt graphics system enables the broadcaster to create elements locally through multiple artist stations at the Washington bureau or receive templates digitally from Moscow via Ethernet connectivity. The graphics system's ability to share elements between locations allows RT to provide an efficient graphics workflow and the framework to expand the capability across all bureaus.

When used in conjunction with the automation, text elements can be placed within programming either dynamically or according to a predetermined schedule. The capability to locate and prepare digital graphics for integration into a live environment is at the core of the graphics system/automation combination.

With Moscow as the central point of bureau integration, programming created at the Washington facility is transported over Ethernet to Russia via TANDBERG H.264 encoders. In Moscow, additional branding and informational elements are added to the network feed. The finished product

Better audio mixing. From every point of view.

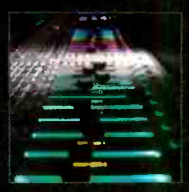
Drawing on more than 60 years of experience in the design of rock-solid, industry-proven broadcast equipment, the Studer Vista 9 is the digital mixing console that makes sense from every point of view – creative, commercial and practical.

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.

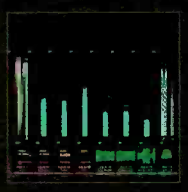
Find out more at www.studer.ch

See us at AES
Booth 1001

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

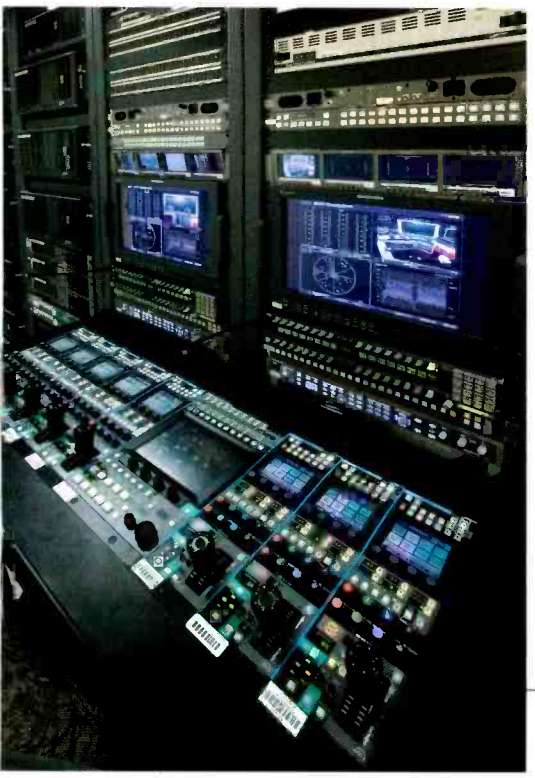
Vista 9 makes surround sound easy

Dual control systems and power supplies ensure perfect peace of mind

VISTA 9™
DIGITAL MIXING SYSTEM

STUDER
by HARMAN

www.studer.ch



A six-channel Vizrt graphics system allows RT to share elements between Washington, D.C., and Moscow.

is returned to Washington for distribution using the same Ethernet transport technology.

Evertz technology provides efficient monitoring within the control rooms. VIP-X multiviewers located in each room allow for up to 32 unique video signals to be positioned across two Samsung large format professional LCD monitor displays in a user-controlled configuration. The broadcaster has the ability to leave the configuration static or modify it to accommodate its changing needs. Visual monitoring of embedded AES audio streams is provided via a bar graph display overlaid upon the video source. Harris VTM-4100 rasterized digital signal diagnostics complement the multiviewers.

An RTS Cronus intercom system was installed to integrate both IFB and facility communications. A Lectronics wireless IFB system located in the control rooms provides communication with talent in either studio, as well as the roving Steadicam operator. Wireless technology is also used to deliver talent lavaliere microphone signals.

Designing the studios

Azzurro worked with RT in developing the technical elements necessary to create its envisioned set designs. The primary studio uses 12 Planar rear-projection DLP seamless cubes to create a 90in x 160in stacked display plus a 103in Panasonic plasma rear monitor as backdrops. The plasma display is outfitted with a touch-screen overlay developed by U-Touch. Using Telestrator presentation software to drive the touch screen, on-set talent can add personalized real-time graphics elements to the live broadcasts.

RT's second set is also outfitted

with a 103in Panasonic plasma monitor as a backdrop. Several additional LCD monitors are placed within the set to provide an opportunity to individualize the various programming being created.

Each of the two studios has three Ikegami HDK-79EXIII HD/SD cameras with Fujinon lenses mounted on Vinten Osprey pedestals. The primary studio includes two additional Ikegami cameras mounted on Jimmy Jib extension and Steadicam. Pedestal cameras are operated remotely to both control rooms using Shotoku pan and tilt robotic heads. All pedestal-mounted cameras are outfitted with Autoscript prompters controlled through the automation system.

Edit suites

Five independent edit suites provide the ability to create customized news and entertainment programming. Each suite is outfitted with Final Cut Pro stations with the ability to perform both real-time and native digital ingest. Submixing capability within the suites provides the ability to add translation tracks on edited programming.

Capturing news from the field

To satisfy RT's electronic news-gathering needs, six Sony PDW-700 camcorders with accompanying XDCAM recorder playback decks were provided. The cameras afford abilities to ingest native digital clips directly to server storage or perform real-time ingest to Final Cut Pro workstations.

Conclusion

Azzurro kept the entire operation functional as it transformed a 12-year-old antiquated studio into a state-of-the-art facility. Advanced and efficient technologies replaced analog and first-generation digital technology for a future-proof and HD-ready serial digital infrastructure with embedded audio. The Washington, D.C., bureau went live in January. BE

Scott Buchholz is director of engineering at Azzurro Systems Integration.

Design team

Azzurro Systems Integration
Marc Bressack, executive VP
Bill McKnight, VP/GM
Scott Buchholz, dir. of eng.
Steve Regina, sr. eng. proj. mgr.
Joe D'Arrigo, proj. lead

RT
Sergey Maganet, technical dir.
Denis Trunov, deputy editor-in-chief
Andrey Bukashkin, chief dir.
Mark Bulla, chief eng.
Mark Angelini, dir. of ops.

Fiber for satellite signals

Fiber-optic cables offer a host of benefits over standard coax in L-band satellite applications.

BY DARREN WARD

Trading bulky coaxial cable for modern fiber optics yields a solution for issues such as attenuation, slope and electrical isolation of satellite L-band signals. Known for its ability to transport signals over long distances, fiber optics opens up new possibilities, particularly with remotely located satellite antennas, while the promise of excellent signal quality bolsters critical applications. The implementation of fiber-optic systems does require extra care and considerations, but, when done effectively, they can provide excellent performance for years to come.

Why fiber optics for satellite L-band signals?

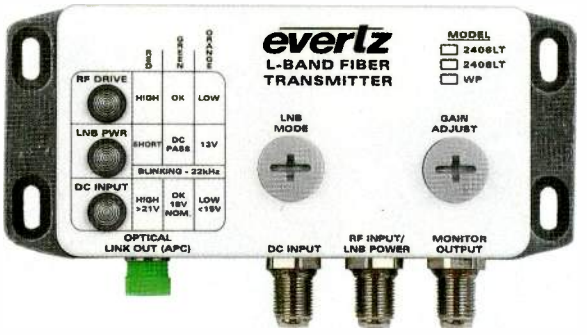
Simply put, fiber-optic links provide better performance over longer distances than coaxial cable. The quality and capability of coaxial cable varies considerably based on the type, but often its practical boundaries start at about 100m. This length can be extended with the help of amplifiers and slope compensation, but with this can come added noise to the signal. With lower-end fiber-optic equipment, the attainable distance can be as long as 20km. When fiber transmitters are equipped with higher-quality DFB lasers and receivers with high-sensitivity photodiodes, a fiber link can extend to more than 100km without optical amplification. These distances are attainable with little to no degradation in signal C/N for low error rates at the IRD. Also, coax loss increases with respect to frequency, causing the signal to slope or tilt. With fiber, there is no slope imparted to the L-band spectrum regardless of the length of the link.

Physically, fiber is small in diameter, lightweight and flexible. This offers space and routing advantages over stiff, bulky coax, especially when compared with hard-line cables. Fiber also provides electrical isolation, eliminating ground loop and lighting issues.

Applications for satellite fiber links

The most obvious use for fiber links in satellite applications is to connect antennas far from the facility that can't be reached using coax. This may be on the same campus or to meet long-haul requirements, which can be fulfilled as long as there is fiber connectivity available between points. A company requiring new satellite feeds may have within its organization another facility with antennas that can supply those feeds. Fiber-optic links make it possible to transport and use those feeds, avoiding the expense and space requirements of installing antennas.

Fiber-optic links provide better performance over longer distances than coaxial cable.



Fiber transmitters can greatly increase the allowable distance between the satellite dish and the studio.

In high-reliability applications, satellite antenna redundancy is straightforward; effectively using the redundancy is another matter. Rain fade can wipe out the signals on both main and redundant antennas if they're physically too close together. Connecting antennas at a sufficient distance from each other can place them in different local weather conditions. If one antenna's signal is degraded by weather, then the other antenna's signal can be used instead. This also protects against physically damaging weather phenomena, which may pass through an area and damage one set of antennas, while leaving the antennas located at a safe distance intact.

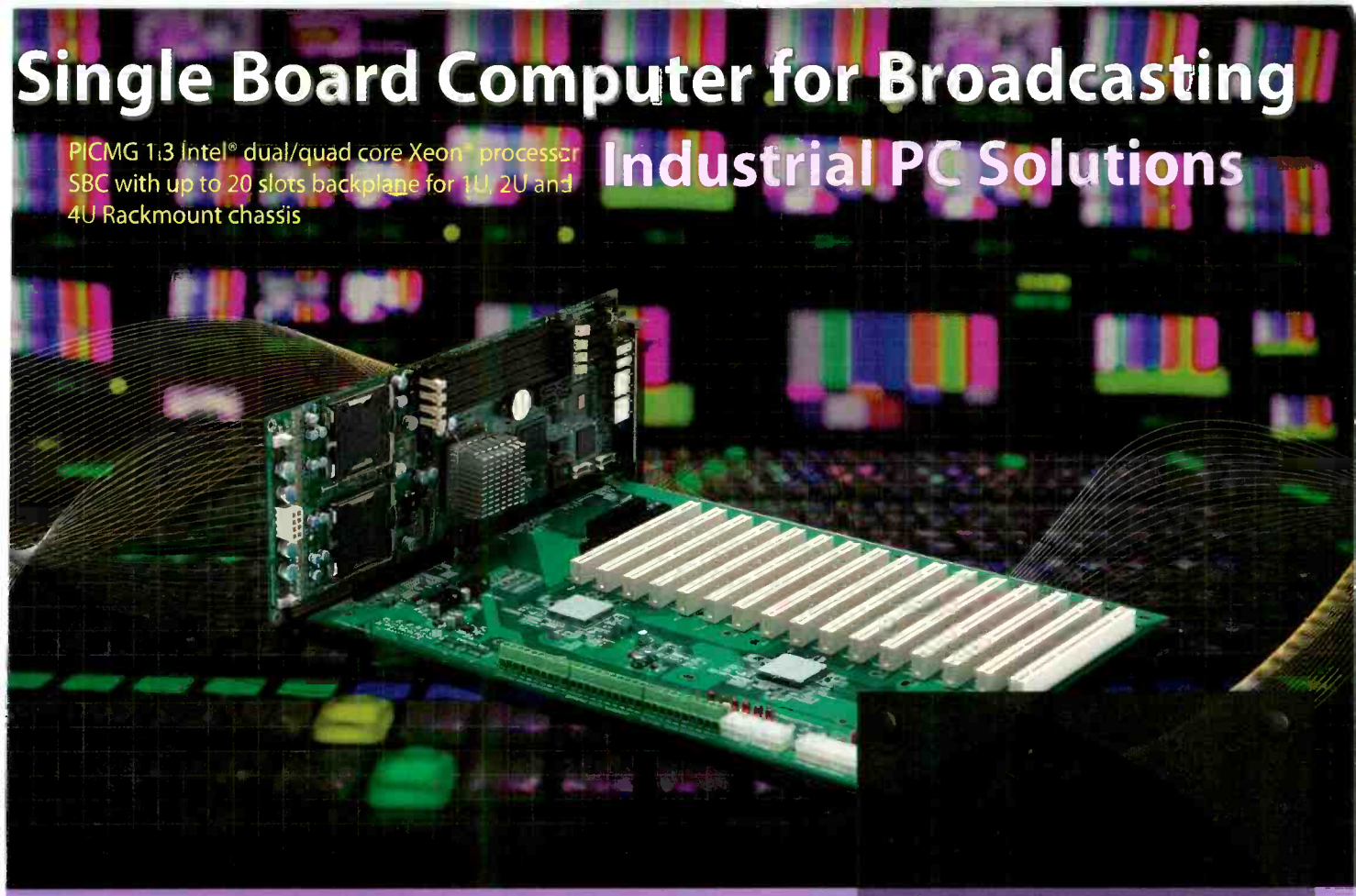
Fiber is superior in situations where signal quality is of the utmost concern. Motivated by the increased bandwidth requirements of HD programming, efforts to increase transponder throughput have spawned DVB-S2. In return for throughput gains at higher-order modulation and coding rates (e.g., 8PSK and 9/10 FEC), this technology demands higher input signal quality and C/N at the IRD, which strains the abilities of coax infrastructures.

Another application is carrier monitoring, in which the signal from the low-noise block converter must be preserved. In circumstances like these, even shorter runs benefit from a fiber link's ability to maintain signal quality.

Single Board Computer for Broadcasting

Industrial PC Solutions

PICMG 1.3 Intel® dual/quad core Xeon® processor SBC with up to 20 slots backplane for 1U, 2U and 4U Rackmount chassis



Expandability • Minimized Downtime • Flexibility • Longevity

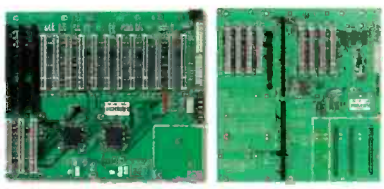
PORTWELL SOLUTION

Portwell is an Executive member of PICMG and leading manufacturer of Single Board Computers. Featuring more expansion slots for add-in cards, high integration with versatile backplanes, and ease of upgrading and maintenance, our solutions are well suited to critical applied computing applications. In addition, Portwell also provides a total solution of rackmount and ruggedized systems.

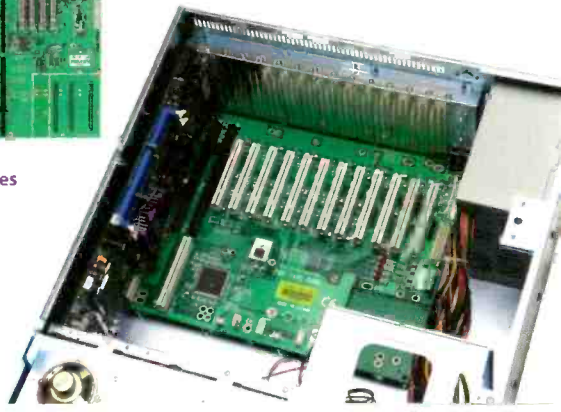
As an Associate member of Intel® Embedded Alliance, Portwell is guaranteed at least five-year availability of Intel® components contained in the Embedded Intel® Architecture. This enables equipment manufacturers to maintain the longevity of products and save total cost of product cycle.

Dual Intel® Quad-Core Xeon® SBC

Intel® Core™ 2 Quad SBC



Up to 20-slots Backplanes



American Portwell Technology

• Address: 44200 Christy St., Fremont, CA 94538, USA • Tel: +1-510-403-3399
• Email: info@portwell.com • URL: http://www.portwell.com

PICMG

intel Embedded Alliance

How L-band fiber links work

L-band fiber-optic links use a straightforward process to transport signals. At the fiber transmitter, the incoming electrical signal is converted to light using amplitude modulation. This light travels down the fiber and is converted back to an electrical L-band signal by the fiber receiver. As with other devices looking for a satellite signal as input, fiber transmitters and receivers operate within a fixed dynamic power range, so the dish size and low-noise block converter gain must provide a suitable signal level. L-band fiber transmitters typically also generate low-noise block converter power, eliminating the need for discrete low-noise block converter power supplies.

Multimode fiber can be used for L-band transport where existing infrastructure dictates, but this comes at the expense of attainable distance. Given the choice, single-mode fiber should always be used for the best performance and longest distance.

Signal loss on the fiber must also be considered because attenuation of the optical signal directly translates into attenuation of the L-band signal. Fiber transmitters are specified with a laser launch power, while fiber receivers are specified with an optical input sensitivity. These two figures dictate the allowable link loss budget on the fiber while still being able to maintain a certain C/N level.

The condition of the fiber itself and fiber connectors also comes into play. Issues such as broken fiber cores, poor fusion splices and dirty or unseated fiber patches cause extra fiber loss and can also cause the light within the fiber to reflect at these points. When reflections occur, the noise floor of the signal at the output of the fiber receiver can be negatively affected in various ways, impacting the recoverability and error rate of the desired signal. Optical time-domain reflectometer reports can show whether there are any significant discontinuities that could cause reflection issues.

Connector types also have a strong influence. In terms of reflection, angle-polished connectors (APC) are preferred because they dissipate reflections generated at the connector interface. Ultra-polished connectors (UPC) are the next best choice because they too dissipate reflections, but not as effectively as APCs. Standard flat connectors (PC) are the least favorable and should only be implemented in cases where there are existing infrastructure limitations. Usable performance can be obtained from PC connectors; however, extra attention must be paid to achieving the best possible seating and cleanliness of every connector interface.

Fiber optics' lack of signal degradation not only improves the reliability of existing applications, but also opens up the possibility of new ones.

Choosing equipment

It's important to choose the right fiber equipment for your specific application to ensure that it does the job as required for years to come. Be mindful of the following:

- *Form factor.* Consider the choice of centrally located rack-mount equipment or small, stand-alone devices that are temperature-hardened and may be mounted on or near the antennas.
- *Expandability.* Dense, modular systems require the minimum amount of rack space and allow for easy future expansion as signal requirements increase.
- *Monitoring and control.* SNMP remote monitoring and control of parameters such as gain levels, RF power and optical levels are useful not only for the fiber link and associated gear, but also other parts of the RF system, such as monitoring the health of connected low-noise block converters.
- *Specifications and features.* Check for good system RF specs, including return loss and frequency response. Look for fiber transmitters and receivers with flexible, manually adjustable and automatic gain control modes to provide optimal laser drive and fiber receiver output levels.
- *Lasers and receivers.* Look for sufficient laser launch power and receiver sensitivity to provide the required C/N performance over the link loss of your fiber. In fiber-limited or leased-fiber applications, wavelength-division multiplexing (WDM) is a technology that allows multiple lasers with different wavelengths, or colors of laser light, to be combined and separated on a single fiber. Coarse wavelength-division multiplexing (CWDM) combines up to 16 signals on a single fiber, while dense wavelength-division multiplexing (DWDM) combines up to 40 signals. Aggregating signals this way saves cost on leased fibers.

Fiber-optic systems enable signals to traverse longer distances than what is possible with traditional coaxial cables. Fiber optics' lack of signal degradation not only improves the reliability of existing applications, but also opens up the possibility of new ones. As satellite technology moves forward, fiber optics will continue to play an important role in providing the signal quality and distance needed to support future innovations. BE

Darren Ward is RF product manager for Evertz Microsystems.

Inter BEE

International Broadcast Equipment Exhibition

November 17–19, 2010

Makuhari Messe, Tokyo Japan

Organizer: JEITA Japan Electronics and Information Technology Industries Association

Professional Show for Audio, Video and Communications

- *Comprehensive view of leading industry manufacturers' technologies and products.*
  Experience latest developments and cutting-edge technology in these industries.
- *Supported by experts from various companies.*
  Gather the latest information and develop new business opportunities.
- *In line with changing media digitization trends across the globe.*
  "Cross Media Zone" to be further enhanced.
- *Three days that will excite those involved in the broadcasting, video and communication industries, and professional creators.*
- *Attend symposia chaired by expert guests, and access new insights and industry trends.*

Products to be exhibited at Inter BEE 2010

Professional Audio Equipment:
Latest audio equipment of the current digital age from DAW, consoles and mixers to microphones and speakers.

Professional Lighting Equipment:
Stage and performance lighting for stages, theaters, outdoor facilities, theme parks, and attraction facilities.

Video and Broadcast Equipment:
Video production workflows and file storage and transmission systems equipped to support the high-capacity era.
Tapeless, wireless and seamless total systems. High-definition (HD) cameras.

Cross-media Zone:

IPTV | Mobile TV | Digital Cinema | Digital Signage | 3D Image

The latest information and industry trends are here!

For Video, Audio, and Communications Professionals

Inter BEE online

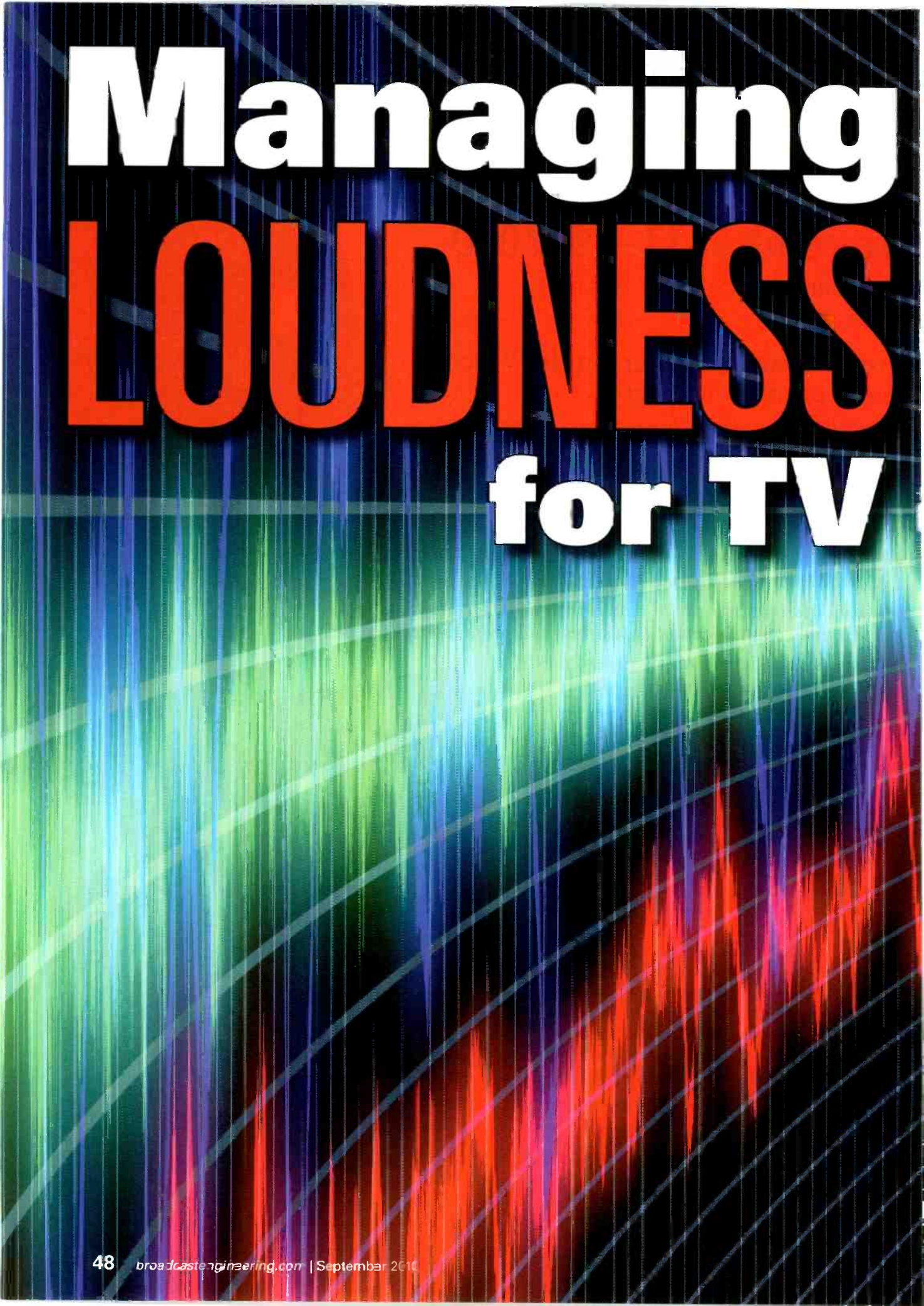
www.inter-bee.com

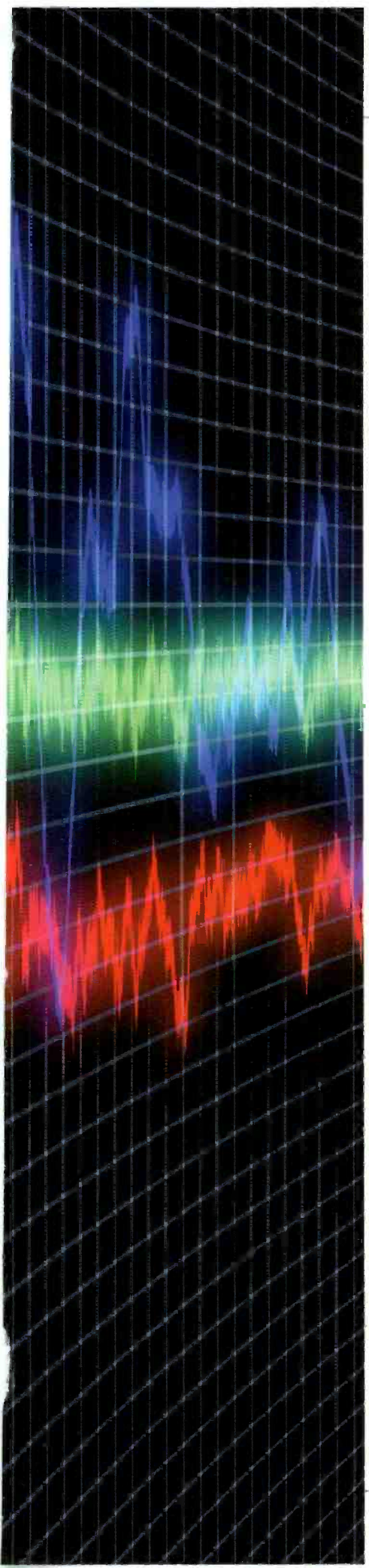
Pre-registration is now being accepted!

Management /Contact : Japan Electronics Show Association
12F Ote Center Bldg., 1-1-3 Otemachi, Chiyoda-ku, Tokyo 100-0004
TEL:+81-3-6212-5231 FAX:+81-3-6212-5225 E-mail: contact@inter-bee.com

Global Partners ABU Asia-Pacific Broadcasting Union | iabm | NABSHOW | CCBN | BIRTV | KOBA | Broadcast Asia | CASBAA

Managing LOUDNESS for TV





BY TIM CARROLL

Arguably the hottest topic in television these days is loudness. The subject has been beaten to death since the serious introduction of legislation to specifically mandate what was already on the books as law, albeit confusingly.

Broadcasters are in a panic because as license holders, they are ultimately responsible for obeying the law and could face fines or worse if not compliant. Rubbing the other side of this issue raw is the desire to preserve program integrity. We could take the route used in the NTSC days and just blindly process the audio to prevent this modern digital version of "overmodulation." This would stem complaints of loudness shifts, but at the expense of changing the content.

So, the industry finds itself between a rock and a loud place. The ATSC document "A/85: ATSC Recommended Practice: Techniques for Establishing and Maintaining Audio Loudness for Digital Television" (available at *www.atsc.org* under Standards) lays out in detail some suggested methods for approaching the problem.

Loudness

Loudness is a frequency-weighted measurement integrated over some time. To do this, the ITU standard BS.1770 describes a measurement method where audio is first filtered to remove the extreme low frequencies while tipping up higher frequencies (to emulate the physiology of our heads). Then samples are stored and averaged to produce a result. This is why the notation looks somewhat strange: -24LKFS means Loudness (integrated over time), K-weighted (filtered), with respect to Full Scale digital.

What exactly gets measured to determine loudness? This is one of the most debated topics within standards organizations around the world right now. The ATSC long ago specified that it should be the average level of spoken dialog, because speech is the most common feature in the majority of television programming. This is the so-called anchor element. The new A/85 recommended practice extends this to encompass any anchor element so that music programs or music-only commercials are not left out. There is wisdom to this idea of an anchor element that might not be readily apparent. Ignoring the anchor and just measuring the overall loudness of all channels all the time can produce results that do not match perception with some programming.

Metadata

The golden and simple rule is this: The loudness of transmitted audio and the transmitted loudness metadata indicator (a.k.a. dialnorm) must match. A summary of the four common techniques of metadata control is useful as no single method is universally applicable:

- *Dynamic.* Measure each piece of content — programs, commercials, interstitials, etc. — either during production or during ingest. Store the audio with a valid loudness reference indication (dialnorm metadata), and make sure the audio and the metadata make it to the consumer.

While not for everyone, this method has proven useful for broadcasters with straightforward and reliable distribution paths, such as movie channels, and has worked well for nearly a decade. The content is not changed and can remain intact to the consumer.

- *Static.* Pick a loudness target, and set the facility's dialnorm value at this number. Then, measure the overall average loudness of each piece of content, and adjust or scale the content if necessary to have it match the target.

The ATSC A/85 recommends a target level of -24LKFS ±1 or 2dB (over time, hopefully) for content that does not have or cannot have metadata, as it was found by terrestrial broadcasters that most of their legacy content fell within this range and had no metadata. It may not be completely appropriate for all broadcasters, especially movie channels where content is likely quieter on average, so some are using

-27LKFS. Remember though, as long as the content loudness matches the metadata value, it does not really matter what that actual metadata value is. Scaling is an overall gain adjustment performed once to realign each piece of audio to the target. Compared with the original, the result may be louder or softer overall, but it has not been otherwise changed.

• *Traditional audio processing.* Similar in many ways to the devices we used in analog television, a traditional processor employs wideband and or multiband automatic gain controls to constantly adjust the audio signal, effectively reducing the peak-to-average ratio. The loudest sections are decreased, and the softest sections are increased toward some center target. This target can be aligned with a static dialnorm metadata value.

Managing loudness automatically but not wanting to modify the content is like swimming without getting wet. The former necessitates the latter, and until time machines become more practical, it is what it is. While some techniques are better than others at preserving a consistent balance, all of these systems change the content compared with the original, although sometimes this is a good thing.

Managing loudness automatically but not wanting to modify the content is like swimming without getting wet.

• *Hybrid metadata audio processing.* This consists of a combination of metadata and traditional audio processing, where present metadata is used to guide processing to be applied only when and if necessary and to generate new metadata based on the measurement of incoming audio. The degree to which the original content is changed is adjustable, from purely traditional with fixed metadata to only protection limiting with dynamic metadata that can be bypassed by the savvy viewer or program producer.

Loudness range

The approach that the ATSC has taken logically matches a single point of focus, the anchor element of a program, but this essentially ignores the loudest and softest portions of a program. It is left up to the program producer to decide what range the rest of the elements will have around the anchor.

Dolby published the comfortable and acceptable listening range based

Continued on page 59

Media Data Center: Rewriting the Rules of Digital Media Production

INSIDE

The file-based media revolution is here. Find out how mediarets are transforming the industry, and how the Cisco® Media Data Center platform helps broadcasters run post-production workflows 80 percent faster than before.

Setting the Stage for Medianets

Now is an exciting time to be in media. A confluence of technological innovation and consumer behavior changes are reshaping the industry. The rise of high-definition video (with its huge new bandwidth and capacity demands), proliferating delivery channels, and interactive video experiences are transforming the way that broadcasters produce and distribute content. Today, feeding the consumer's insatiable appetite for media means delivering content over the air, to the TV, and to PCs and mobile devices over the Internet.

These changes offer opportunities to streamline media production and exploit new delivery channels to generate revenue from original and archived content in new ways. However, they also introduce complexity, in the form of more media formats, resolutions, and delivery channels than ever before.

Broadcasters worldwide are transitioning to file-based media to enable this industry evolution. In Western Europe, 69 percent of broadcasters will migrate more than half of their production workflows to fully file-based environments by 2011*. Successfully navigating this transition, however, requires a new approach to media workflows and video distribution. This new approach requires a medianet.

A New World of Medianet Technologies

A medianet is an all-IP Next Generation Network (NGN) optimized end-to-end for video and media services. It provides a single, scalable IP architecture that extends from the point of content ingest through every aspect of editing and production, across video contribution and distribution networks, and all the way to the consumer's screen (Figure 1).

By embracing medianets, broadcasters and media companies can:

- **Reduce time-to-air** with file-based media production platforms that eliminate tape-based processes, enable multiple users and devices to access content simultaneously, and run workflows five times faster than conventional techniques
- **Transform video production and distribution** by enabling stakeholders throughout the media value chain to collaborate in new ways
- **Reduce costs** by virtualizing resources, consolidating equipment, and converging IT and production functions over a single IP NGN
- **Provide nonstop operation** through a network infrastructure that has been independently validated to deliver the performance and scalability that high-definition media services require
- **Monetize media more effectively** with the ability to produce and distribute content for any device or platform, rapidly introduce new services, and efficiently access and control media archives

Cisco is leading the way in medianet technologies, and broadcasters worldwide are already using Cisco solutions in demanding high-definition media environments. Now, Cisco is taking medianet innovation to the next level with the Cisco Media Data Center. This powerful IP architecture unifies production processes, storage, and client infrastructures to unleash the full potential of file-based production. As a result, broadcasters can reduce file transfers by an order of magnitude, offload media traffic from the IP network, cut storage requirements, and speed workflow execution times by 80 percent. Read on to find out more.

Q&A with Luc Andries of VRT-medialab

Luc Andries is a senior infrastructure architect and storage and network expert with VRT-medialab, the research and development arm of Flemish public radio and television broadcaster VRT. He presently leads the media infrastructure team at the Intec Broadband Communication Networks (IBCN) research group at the University of Ghent in close cooperation with CandIT-Media, a spin-off company of VRT-medialab specializing in media infrastructure.

Q. What would you say to media companies facing the transition to file-based production systems?

A. It is important to understand that building an IP network for media is different. Applying the standards-based IT infrastructure to media introduces a number of benefits to media workflow systems, but treating networks as a commodity IP technology in a media environment is a recipe for failure. Taking into consideration the specific requirements of media applications is crucial for choosing the right equipment and design.

Q. So where should they start?

A. Media workflows are becoming storage-centric in nature. A high-performance central storage system platform is needed for a successful implementation of a media workflow. Once you have such a unified media data center in place, you are also able to pull media services and applications into the platform. This, along with direct connections to client workstations, simplifies the workflow. If the platform is built correctly, execution is performed in a lossless and guaranteed high-throughput environment.

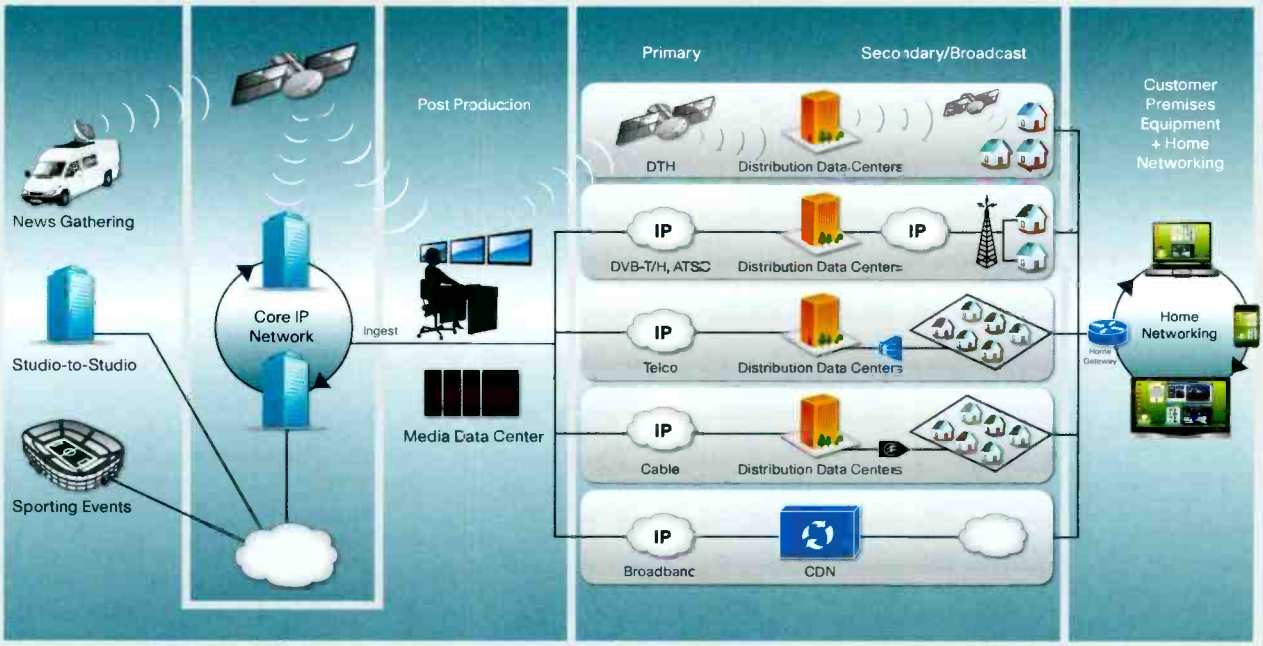
Q. How do you see the evolution of Ethernet in the data center environment?

A. With the advances in Ethernet speeds and the enhancements standardized by IEEE with Data Center Bridging (DCB), Ethernet has become an attractive choice as the technology for convergence in the data center. Our laboratory tests clearly show that DCB provides a compelling media storage solution. We were able to create an IP network infrastructure that was more than capable of handling media traffic flows over Ethernet, utilizing switches from the Cisco Nexus family and the Cisco Unified Computing System. I believe that the market is ready for a move toward all-Ethernet transport, consolidating servers and networks in a standards-based environment.

Q. How does the Cisco Unified Computing System come into play here?

A. Cisco Unified Computing System was a natural addition to the media data center environment. We are currently integrating different services such as media asset management into the Cisco Unified Computing System environment. With the Cisco Unified Computing System's extensive memory and virtualization capabilities, I can envision it being a central piece, serving as a home for different media applications. This will enable media companies to save hardware costs while increasing the simplicity and performance of their media data centers.

Figure 1: Medianet Architecture



Cisco Media Data Center: A Powerful Platform for Media Workflows

In media production, creativity has long been bounded by the physical limitations of production workflow processes. Editing and post-production are often shackled to physical editing suites. A reliance on physical tapes means that content must be continually copied and re-ingested at each stage of production, leading to slow, linear workflows, and high costs for storage and archiving. In the analog age, these issues were acceptable inconveniences. In the world of modern media–where broadcasters must serve multiple formats and delivery channels, and where the distance between content creation and content distribution continues to shrink–yesterday's production technologies simply cannot keep pace.

At the root of all of these problems is a production workflow model based on "siloed" applications: loosely connected islands of servers and storage for each production process, none of which has been integrated into an overarching file-based workflow. This model provides the high performance that media applications require (a level of performance far beyond typical IT applications), but is extremely complex and difficult to scale. To unlock the full potential of file-based media workflows, media companies need a new kind of technology platform.

Cisco Media Data Center

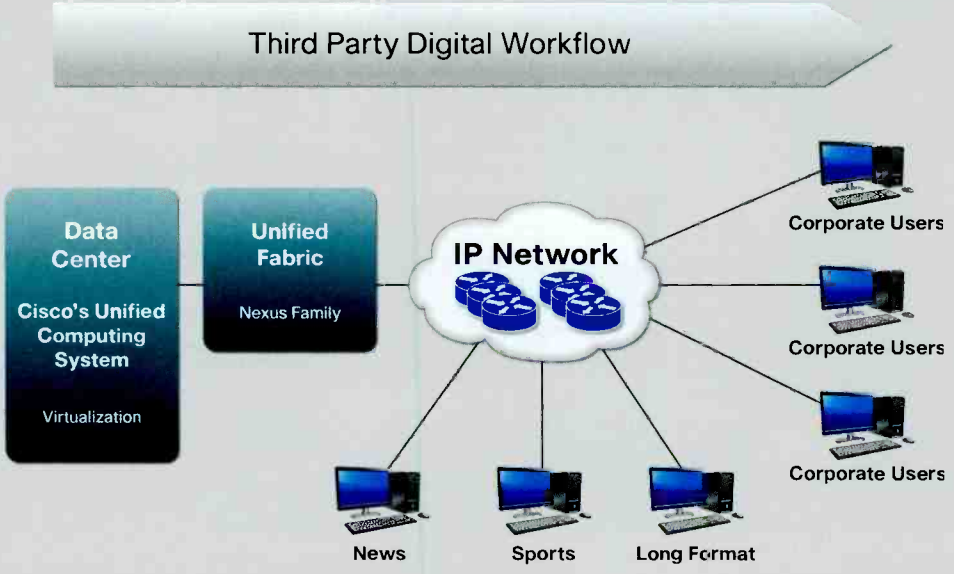
The Cisco Media Data Center is a video-optimized network and data center infrastructure that provides the foundation for end-to-end digital media workflows. Instead of running each application on its own island, it provides a common high-performance, high-capacity server and storage architecture for all applications, including both media and IT functions (Figure 2).

At the core of the Cisco Media Data Center is the ability to virtualize resources across the media company and to consolidate computational, storage, and networking resources across different applications and business units, while maintaining the appearance and functionality of physically separate systems. Instead of duplicating equipment and resources for each production and IT function (most of which are rarely used to capacity), the Cisco Media Data Center uses a single virtualized architecture and dynamically provisions resources wherever they are needed. The results are improved efficiency and resource utilization, reduced time-to-air, and lower costs.

With the Cisco Media Data Center, broadcasters can:

- **Increase collaboration** by breaking down barriers between production teams, business units, and ecosystem partners, and letting everyone share a common technology infrastructure and a single file-based storage system
- **Virtualize content, applications, and resources** across the organization, unleashing new flexibility while lowering equipment and maintenance costs
- **Reduce time to air** by streamlining complex production environments, optimizing slow linear workflows, and allowing instant access to file-based content and archives
- **Provide a lossless Ethernet-based production environment** that has been independently proven to deliver the performance and scalability that high-definition media applications demand (see following section)
- **Accelerate innovation** by linking content production systems directly with ecosystem partners, allowing broadcasters to reach new media distribution platforms and customers and to monetize content in new ways

Figure 2: Integrating Production and IT Functions over a Common IP Infrastructure



Media Data Center Building Blocks

The Cisco Media Data Center is based upon the Cisco Unified Service Delivery architecture and a Cisco IP NGN. This standards-based solution fully supports and integrates with a variety of leading third-party digital workflow and production applications, as well as traditional IT and data center functions. It encompasses:

- **Unified Fabric:** The Cisco Nexus® family of switches provides the lossless infrastructure to support all media data center services, including LAN and SAN connections, over Ethernet. This simplifies the data center to a single set of fully virtualized connections, improving resource utilization and lowering costs. The solution also integrates Cisco MDS storage products.
- **Virtualization:** Instead of the traditional data center model–in which each application has its own server and storage infrastructure, often utilizing as little as 15 percent of the available hardware resources–the Cisco Media Data Center runs applications on "virtual machines" that share a common pool of hardware. Designed in partnership with virtualization leader VMware, the solution simplifies the management of these virtual machines and allows media companies to dramatically improve data center resource utilization and energy efficiency.
- **Cisco Unified Computing System:** The groundbreaking Cisco Unified Computing System unifies server, storage, and networking resources into a single system, providing a fully integrated, pre-engineered media data center solution.
- **Cisco IP NGN:** Cisco's industry-leading routing, switching, and video products provide end-to-end delivery of IP services with advanced media-aware features. They span core, edge, and user equipment, and provide an intelligent network that is both service and application aware, providing scalability and capacity for high-definition media applications.

Together these solutions provide a powerful foundation for efficiently delivering content and computing resources wherever and whenever they are needed, enabling broadcasters to reap the full benefits of file-based media workflows.

Partnering with the Worldwide Leader

For broadcasters and media companies, the future has arrived, and the transition to file-based media workflows has begun in earnest. Cisco is the ideal partner for this industry evolution. Cisco can provide:

- **A lossless Ethernet data center platform** for enabling end-to-end media workflows
- **Total flexibility,** with the ability to support any standards-based hardware and the leading media production applications
- **High performance,** with a proven, independently tested data center infrastructure
- **Maximum scalability** to cost-effectively support evolving high-definition media production environments
- **Industry-leading media partners** that provide a complete ecosystem of data center, virtualization, and media workflow capabilities

Cisco designed the Media Data Center for demanding file-based media environments, but how does it perform with real-world high-definition editing applications? VRT-medialab, the research and development arm of Belgian public broadcaster VRT, put the solution to the test. The lab found that the Cisco Media Data Center not only provided ample throughput and scalability for high-definition media, it also dramatically optimized the production environment, cutting storage requirements by up to 50 percent and reducing workflow execution times by 80 percent.

The Challenge

Most of today's file-based production architectures link multiple self-contained media service products, each with its own local storage, servers, and network, in a best-effort mode through the central IP network. This approach creates duplication and complexity, and relies heavily on the central IP network, a network composed of classical IP switches designed for the IT world, not for media traffic (Figure 3).

The reason for this "siloed" design is that many media solutions require the processing power of a storage service. The straightforward answer then is to unify local server and storage platforms for all services into a centralized platform, a virtualized media data center. Such a solution would replace the IP network as the basic platform for interconnecting media services, creating a simpler and more efficient "private media cloud" (Figure 4).

To enable this solution, however, a media data center must provide:

- **Lossless Ethernet-based storage with ample capacity, redundancy, and availability**
- **High throughput and linear scalability**
- **Support for multiple operating systems**
- **Effective virtualization of applications and resources in high-definition production environments**

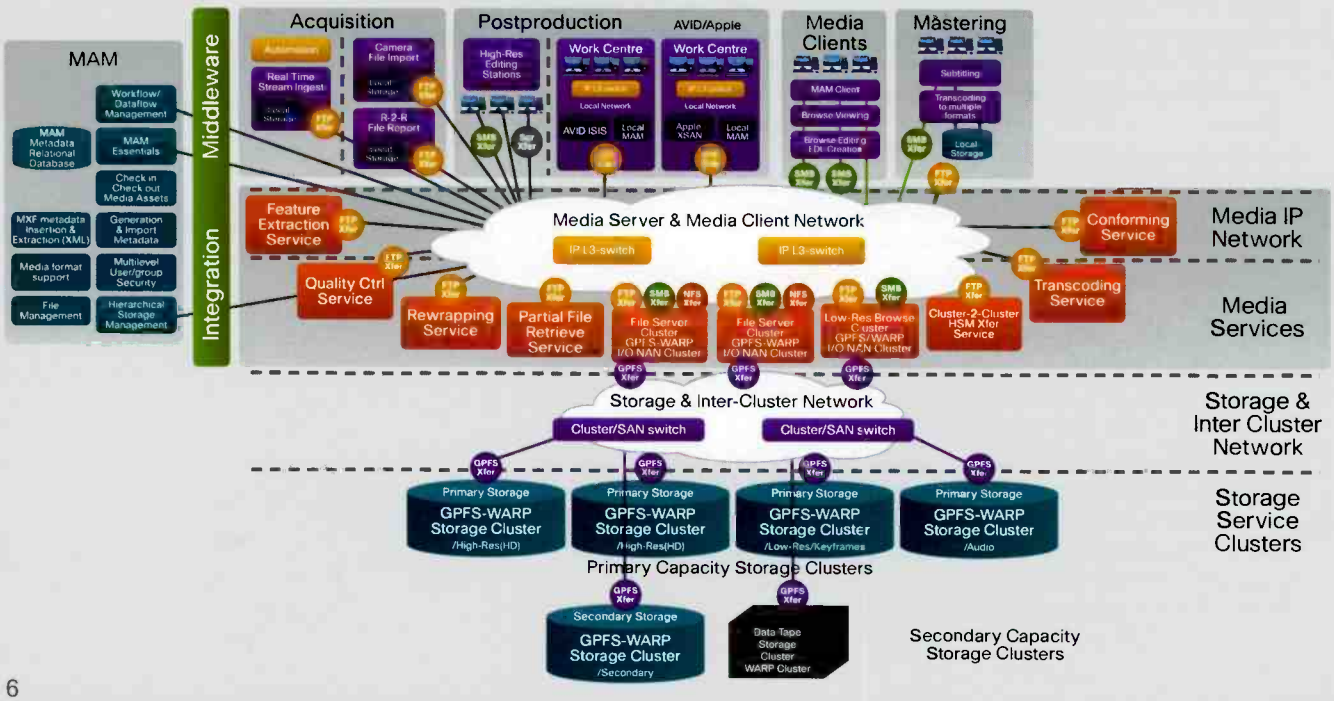
VRT-medialab tested how the Cisco Media Data Center stacked up.

Creating a Lossless Ethernet Environment

Today, many file-based media storage environments use Infiniband storage network interfaces because of Infiniband's high link bandwidth. With the introduction of the Cisco Media Data Center, Cisco uses Data Center Bridging (DCB), supported by Cisco Nexus switches, to provide lossless transport over Ethernet.

VRT-medialab tested DCB against Infiniband in a typical media environment, using both Linux- and Windows-based storage nodes. The results were compelling. **In the Linux-based cluster, DCB delivered comparable or better performance to Infiniband. In the Windows cluster, DCB delivered as much as five times the throughput of current state-of-the-art Infiniband solutions.** *(See Employing Data Center Bridging in media networks, Broadcast Engineering, January 2010.)*

Figure 3: Traditional IP-Network-Centric, File-Based Production Architecture



Accounting for Bursty Media Traffic

Some early attempts to transition to file-based environments have been stymied by IP networks that do not behave as expected. Throughput decreases and becomes unpredictable, and transfers may even be lost. The reason for this mysterious behavior is the intrinsic difference between IT and media traffic.

Where IT traffic generally consists of short messages or small files, media traffic consists of bursts of very large files (several gigabytes), which use the link for a long time period and almost constantly try to use 100 percent of the available bandwidth. Even if a network is designed with enough capacity at the macro scale, media flows sharing a common link interfere with each other at very small time-scales, oversubscribing the switch buffers and ultimately introducing packet loss.

To account for this behavior, the Cisco Nexus switches in the Cisco Media Data Center utilize Priority Flow Control (PFC) and egress buffers that can handle large, bursty media file transfers. VRT-medialab tested this claim using Avid high-resolution editing clients running multiple streams of high-definition video. **The result: traffic passed unhindered through the switch with no oversubscription, no packet loss, and no effect whatsoever on video playout. The solution sustained 100 percent bandwidth utilization under even the most demanding conditions and demonstrated ideal scalability.** *(See Facing media traffic challenges, Broadcast Engineering, February 2010 and Building IP-centric media data centers, Broadcast Engineering, March 2010.)*

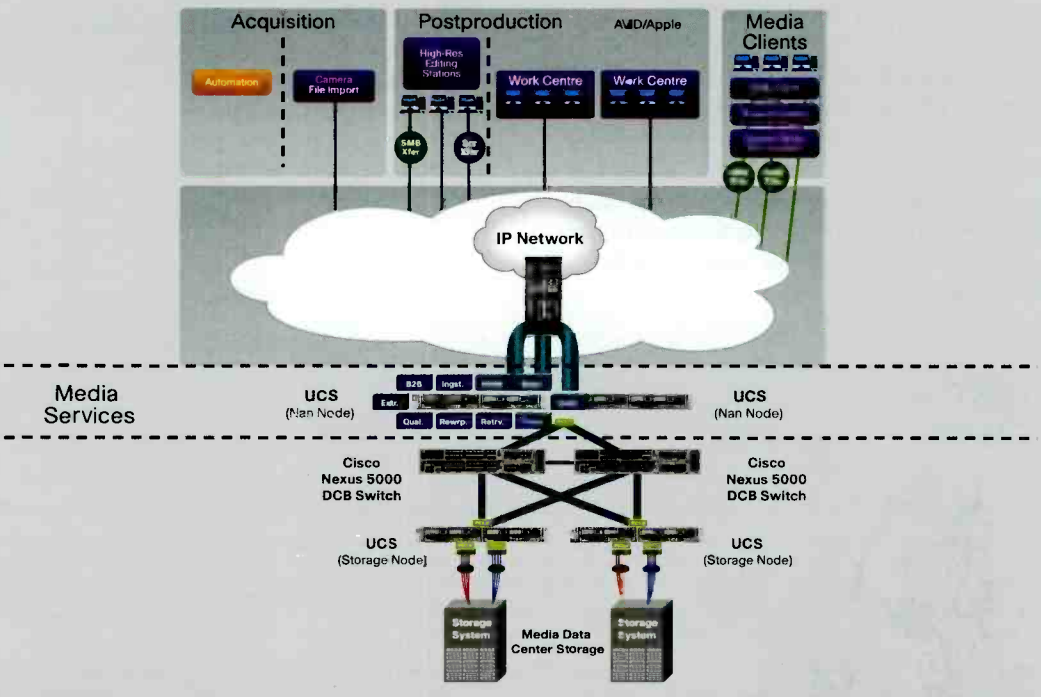
Providing a Virtualized, End-to-End Architecture

Implementing media services on the processing nodes of a virtualized media data center mounted on clustered, lossless central storage should shorten transport paths and simplify data flows considerably, increasing workflow efficiency. To test this, VRT-medialab implemented a workflow taken from the real world of post-production: the ingest of a video clip from a file-based camera into the central storage, and the selection of the material and transport to both Apple and Avid high-resolution editing stations.

While the workflow appears straightforward, the actual data flow in a conventional file-based production architecture (in which files are transferred among isolated islands of servers and storage) is extremely complex, encompassing 36 file transfers. By virtualizing all production processes on Cisco Unified Computing System servers, the Cisco Media Data Center dramatically simplified the data flow. **The test architecture achieved a workflow execution time 80 percent faster than traditional file-based architectures, reduced the number of file transfers by an order of magnitude, and reduced IP network traffic by 90 percent.**

For more details about this test, including specific test scenarios and configurations, *see Virtualized media data centers, Broadcast Engineering, August 2010.*

Figure 4: Private Media Cloud Solution



A New World of Media at the Consumer's Fingertips

The future of media services is here. As new delivery channels and business models proliferate, broadcasters worldwide are building medianets to bring a new generation of video experiences to consumers. Cisco Media Data Center stands at the forefront of these emerging medianet technologies. However, delivering and monetizing new media experiences requires more than a next-generation workflow platform. It requires an end-to-end medianet that is network-aware, media-aware, and device-aware, and extends all the way from the camera to the customer's screen.

Cisco is leading the way in medianet technologies and can offer broadcasters a true end-to-end solution. Working in concert with industry-leading media partners, Cisco provides deep expertise in IP networking, file-based workflow technologies, video transport, and intelligent solutions for the customer home. Cisco can converge all of these solutions into a single, harmonious IP architecture that extends media-aware intelligence through:

- **Media production** with a groundbreaking Media Data Center that eliminates inefficient linear processes and unleashes the benefits of file-based production workflows
- **IP contribution** solutions that combine broadcast-grade high-definition video transport with the flexibility, control, and cost savings of IP networks
- **Content distribution** with an IP NGN that can serve multiple platforms and affiliates, rapidly scale new media to a global audience, and maintain the highest quality of experience
- **Content consumption** with revolutionary IP solutions for the consumer home that help broadcasters deliver and monetize more personal, social, and interactive media experiences

Cisco is helping broadcasters around the globe as they move to file-based media environments and deliver the next generation of media experiences. Cisco can provide the following:

- **All-Ethernet media platform that can support any standards-based technology or application**
- **Proven data center platform that has been independently verified to meet the stringent requirements of high-definition media production and radically reduce workflow execution times**
- **Ecosystem of industry-leading media production, virtualization, and integration partners working hand-in-hand with Cisco to deliver a complete, pre-integrated medianet solution**

It's time to deliver the future of media experiences to your viewers. Find out how at **www.cisco.com/go/msb**.

www.cisco.com/go/msb

Americas Headquarters
Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

Europe Headquarters
Cisco Systems International BV
Amsterdam, The Netherlands

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at www.cisco.com/go/offices.

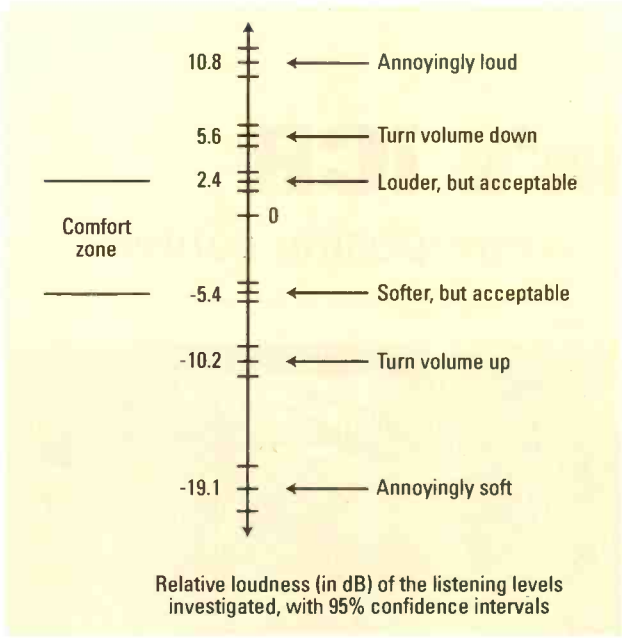


Figure 1. Acceptable listening range. Courtesy Jeff Riedmiller and Dolby.

on listening tests with actual viewers. (See Figure 1.) The scale is asymmetrical. Sound can get softer over about a 10dB range and still be acceptable, while sound that gets louder can only go about half as far and still remain comfortable.

At first glance, it would seem that a 15dB range is not much, but remember that this is a weighted loudness measurement and is content-dependent. Crickets are probably fine 30dB quieter than the reference, but a critical line of dialog is not. A brief explosion that is 10dB higher than the reference is probably OK, but a line of dialog is probably not. This is where the creativity of the program producer and the expertise of the mixer come in to play. The best ones recognize that a 15dB range for dialog or other anchor-like elements might in fact be too much for a typical viewing environment and mix accordingly. Of course, not all content is so lucky.

What to do?

The best solution is to follow the four recommendations above in order, to the extent that each is applicable. Try to get it right from the start if possible. If your facility does not yet support dynamic metadata, the target approach works well, and there are a myriad of feature-packed meters and scaling tools available today both in hardware and software form. Don't be afraid to install safety protection processing at the end to catch any rogue content.

Modern television audio processing can help to manage the loudness range, and it can work much more effectively if average loudness is already consistent. Smart processors will use metadata to their advantage, and hybrid processors will use it to the benefit of the program producer.

Getting this right will take a continuing industrywide effort that should not be driven by regulations and regulators alone. However, it is understandable why both might be inevitable. BE

Tim Carroll is the president and founder of Linear Acoustic.

AmberFin's iCR

The software system aids in repurposing content.

BY MARK HORTON

The last decade has seen a fundamental shift in the media content market, including an evolution in how users want to consume their media that only seems to be gaining pace. Content is not only pushed out via traditional entertainment mediums such as TV and cinema, but it also is distributed over a variety of new channels, including mobile devices, IPTV and the Internet. To keep ahead of their competitors, content owners need to be able to code and disseminate content in the required formats simply and easily without compromising on quality.

The uptake of consumer calls for HD content presents an additional challenge. While it greatly improves and enriches the viewing experience, it has also raised issues around format and standards conversion and monetization for broadcasters and content owners. Broadcasters may be required to incorporate SD segments into HD programs, archive material in a documentary or sports program, or fill time on HD channels with SD content.

AmberFin's iCR technology is an open standards, future-proof platform that digitizes and transforms new and archived content.

Digitizing and transforming content

AmberFin's iCR technology plays a key role in turning the content that owners have into the content their customers want. It is an open standards, future-proof platform that digitizes and transforms new and archived content. It delivers the best quality pictures at smaller file sizes across multiple delivery platforms, including the Internet, VOD, TV, mobile and other small-screen devices.

The software uses the latest MXF and JPEG2000 functionality for mastering, enabling content owners to create mezzanine masters that can then be transcoded down to the required format. The system also supports SD-to-HD file format conversion, including a new benchmark in software standards conversion image quality.

The iCR product range is a family of software programs that allows users to supply their own open, generic PC hardware to keep entry and support costs to a minimum. It also means that broadcasters can upgrade their PC hardware in line with wider industry developments rather than being tied to a single vendor's dedicated hardware product road map. A good current example is 1080p, which many older dedicated hardware systems may not support at all or only with substantial upgrade costs.

There is a specific need for high-quality 576i upconversion to 720p across Europe — and for file-based standards conversion for international program exchange.

Some specific challenges include scaling pixels up or down to give the sharpest results, remapping interlaced pixels onto a progressive display without artifacts, and exchanging file-based content across continents without the costs, complexity and potential loss of quality of using baseband video hardware converters. Up to now, the broadcast industry has relied heavily on traditional dedicated hardware-based video format and standards converters, but the industry is moving away from hardware to software and away from video to files.

The system can handle full HD ingest, output, repurposing and QC, and it automatically creates low-quality proxies to reduce storage and distribution costs.

The system also helps content

owners address a number of the challenges of today's broadcast industry such as automated transcoding to almost any file format or flavor, allowing content owners to conform content to the Web, mobile, HD, etc., and can provide a 25 percent reduction in file size for equivalent quality video. It allows for integration into core workflows for fully transparent repurposing.

Automated real-time QC capabilities cover almost any observable parameter, allowing report review of quality of hours of video in a matter of minutes, as well as exporting QC reports to give content a "pedigree." The system can handle full HD ingest, output, repurposing and QC, and it automatically creates low-quality proxies to reduce storage and distribution costs. It features a modular architecture, allowing content owners to buy the tools required for encoding, mastering, repurposing or virtual videotape recording. The system can be used through any number of other industry devices and front ends.

iCR is completely interoperable with existing systems and workflows, and it includes HD/SD up/down/crossconversion for almost any file type.

Summary

As broadcasters and content owners face new challenges in providing a plethora of content for a growing number of mediums, they are looking for cost-effective systems to help them manage this change. iCR is completely interoperable with existing systems and workflows, and it includes HD/SD up/down/crossconversion for almost any file type.

The solution helps increase the value of archive content by creating high-quality file masters from old tapes. Its automated QC lets users identify picture, sound or data errors quickly to avoid costly and time-consuming reworks. BE

Mark Horton is a product marketing manager at AmberFin.

Alteran's ViTaDi

Content owners face a massive challenge as their material disintegrates.

BY TYLER PURCELL

Content owners are facing a monumental challenge today: convert their legacy material to new digital formats or forfeit it forever. Television networks and every other organization that harbors a library of priceless, irreplaceable content must uncover a solution or stand by helplessly as it deteriorates and the opportunity to monetize assets vaporizes.

As an affordable alternative, Alteran Technologies has designed the ViTaDi product suite, a rapid and scalable digital migration solution that captures, transcodes and delivers video in multiple video/audio file formats to media servers, digital archives and asset management systems. The solution uses a systems integration approach and incorporates partner products for maximum efficiency. Using both new and legacy technology, it adapts to a content owner's pre-existing system architecture and integrates with any pre-existing tape library system. Its ability to be installed on-site allows tapes to remain in their original controlled environment.

Alteran's Robo Pack can hold small or large Betacam cassettes of varying formats.

The system's scalable robotic hardware/software video migration solution enables the automated digitization of video content. Using a complex and proprietary database backbone, the system can ingest multiple channels of content at a single time, making it an efficient migration method. This customizable turnkey system targets high-volume encoding of videotapes to digital file formats, which allows for accessibility to searchable digital archives and asset management systems.

The product series includes a fully automated robotic and a semiautomatic capturing system, capable of ingesting a multitude of video formats and recognizing all standard cataloging bar code systems. After the ingest phase, the video content is automatically organized using a digital asset management (DAM) solution, which makes the assets available for transcoding and repurposing. The storage phase can be easily adapted to a pre-existing or new storage system.

Automatic and semiautomatic capture systems

The Robotic Package (Robo Pack) is designed to facilitate the maximum production with the least amount of downtime. The robot is capable of holding small or large Betacam cassettes of varying formats, such as Betacam, Betacam SP, Digibeta, IMX, SX and HDCAM.

Auto Package (Auto Pack) serves as a semiautomatic capturing solution that allows any serial RS-422 VTR to be connected as an ingestion source. It features an intuitive tape-handling tool easily operated by technical or nontechnical personnel. Formats include 1in, 3/4in, U-Matic, D1, D2, D3, D5, D9, DTC, DVCPRO, DVCAM and many more.

The system works in combination with both HD and SD versions of Telestream's Pipeline network encoder to automate the process of simultaneously capturing and digitizing multiple videotapes and encoding them in real time to digital video files. Telestream's Episode Engine works in tandem with ViTaDi and Pipeline to begin transcoding the video files to additional formats while they are being encoded.

It offers a rich feature set to optimize the digital migration process. The ViTaDi Control Software (VCS) not only controls the interface to the hardware, but also organizes the capture data, allowing one-touch ingests and metadata embedding without any operator interference. Using the smart capture option, ingest is achieved with or without client-provided data or time code, thus allowing smooth captures from any original tape, every time.

ViTaDi's database (VDB) works directly with pre-existing database infrastructures, allowing seamless migration of all data pertaining to the capture process. The system accepts .CSV and .XML files for maximum compatibility. Data is inserted directly into the file during ingest to further streamline the process. The video streaming monitoring system continuously streams the final output file at near real time to ensure the file is being recorded and quality requirements are being met.

Extended Package (Ex Pack) offers

a transcoding option, allowing for simultaneous capture and transcoding without user interference. Transcoded files can be immediately used for asset management solutions, or put directly on the Web. Transcoded file types include Flash, Windows Media H.264 and many more. Using Digital Vision hardware technology, it can reduce noise in the audio and video signals for all formats. The archiving solution allows for automatic storing, searching and reviewing of captured material, including metadata, logging info and any other data or file.

A powerful and optional quality control tool, ViTaDi Quality Control (VQC) allows each file and original video content to be automatically checked against a set of user-adjustable parameters that once configured, allow for extremely accurate reporting on each file.

As content owners stand at a critical crossroads and decide whether to digitize or disintegrate, an affordable remedy has come to their rescue.

Conclusion

As content owners stand at a critical crossroads and decide whether to digitize or disintegrate, an affordable remedy has come to their rescue. The ViTaDi product suite's ability to adapt to pre-existing systems architecture and to use both new and legacy technology allows owners to achieve their objectives without breaking the bank. The solution ingests multiple channels of content at a single time, making it an efficient digital migration method. Its ability to be installed on-site reduces error probability by allowing tapes to remain in their original controlled environment. The system addresses any video library migration challenge and lets content owners control the future of their material by giving them the opportunity to manage and monetize their assets. BE

Tyler Purcell is VP of engineering for Alteran Technologies.

Anton/Bauer's DIONIC HCX

The Li-Ion battery provides a 120W/h capacity and the ability to sustain a 10A draw.

BY JOE MURTHA

When it comes to batteries for professional video and broadcast camera applications, Li-Ion is the preferred choice, thanks to its high energy density, minimal maintenance needs and low self-discharge among other benefits. A major disadvantage, however, is that most Li-Ion batteries have low load-current capabilities, making it difficult to use them with high-wattage cameras and lights. Therefore, a great need for a Li-Ion battery that can handle high current loads has long existed in the marketplace.

Anton/Bauer's answer to this need is the DIONIC HCX, a high-wattage-capable Li-Ion battery. At approximately 120W/h, it is designed to deliver up to 50 percent more load than most existing professional video Li-Ion battery packs, allowing for high in-rush current applications such as on-camera lighting above 50W with no detriment to battery life cycle or run-time performance. It also represents a 20 to 25 percent increase in capacity over existing 90W/h to 100W/h professional video battery packs, enabling longer camera run-times before replacing a battery.

The DIONIC HCX has a built-in motion-detection sensor and a deep sleep capability, which increases battery life by mitigating Li-Ion battery self-discharge when the battery is not in use.

Protection

Building a Li-Ion battery that can stand up to high current loads comes down to three core elements: protection, energy efficiency and safety. For protection, one of the first things we did when developing the battery was to create a high-current-capable protection circuit for it. This way, when there is a high in-rush current, such as one might find with lighting, the camera won't automatically shut off.

As a backup to the protection circuit, the battery's fuel gauge is equipped with a controlled safe-charge functionality, which monitors the voltage of the pack to protect it from overcharging. As an added precaution, the fuel gauge can lock itself off from chargers it is unable to identify.

Energy efficiency

Beyond circuit protection, a large element of designing a high-current-capable Li-Ion battery comes down to making it energy efficient. The DIONIC HCX includes a new smart interface and printed circuit board developed for the battery's fuel gauge. What makes this fuel gauge special is its "deep sleep" mode, which allows users to store the battery for extended periods of time without losing a large amount of fuel. Essentially, the cells self-discharge at an exceedingly low rate, enabling a user to store the battery conceivably for years (though that is not recommended).

We designed the battery's fuel gauge based on the real-world needs of users. While most people would not store a battery for years, many do store batteries for several months in between uses. In the past, some discharging would occur because of fuel gauge and self-discharge of the cells. The deep sleep mode has mostly resolved this issue.

As an added precaution, the fuel gauge can lock itself off from chargers it is unable to identify.

A motion detection device on the fuel gauge printed circuit board wakes it up as soon as someone picks up or moves the battery, and the capacity can be read instantaneously. Other things that will wake up the fuel gauge from deep sleep mode are camera communications, the detection of a camera load, the detection of charged current and the detection of communication with one of Anton/Bauer's smart chargers.

Because there is nothing more

irritating than losing battery power in the middle of an important shot, it features a real-time gauge. An LCD screen indicates how much run-time is left on the battery, depending on the type of camera load it's carrying. For example, if one is using a high load camera, the display will indicate a two-hour run-time. If using a lower load camera, this may increase to four hours of run-time. In essence, differing loads are taken into account and displayed directly on the screen, for up to 10 hours.

The DIONIC HCX features a real-time gauge. An LCD screen indicates how much run-time is left on the battery, depending on the type of camera load it's carrying.

Safety

The DIONIC HCX is one of the first of our batteries to have a new mechanical construction specifically developed for safety purposes. This design resembles a honeycomb, where each individual cell of the battery is contained in its own sort of housing. This way, if the battery is dropped or abused in any way, the cells that are damaged won't affect undamaged cells, as the heat thermal transfer is minimized. More important, it helps prevent fuel leakage, protecting the person handling the battery.

A Li-Ion battery that can deal with high current loads is no longer a dream, but a reality. By taking protection, energy efficiency and safety into account, we've created the proof of this in the DIONIX HCX. BE

Joe Murtha is engineering manager for Anton/Bauer.

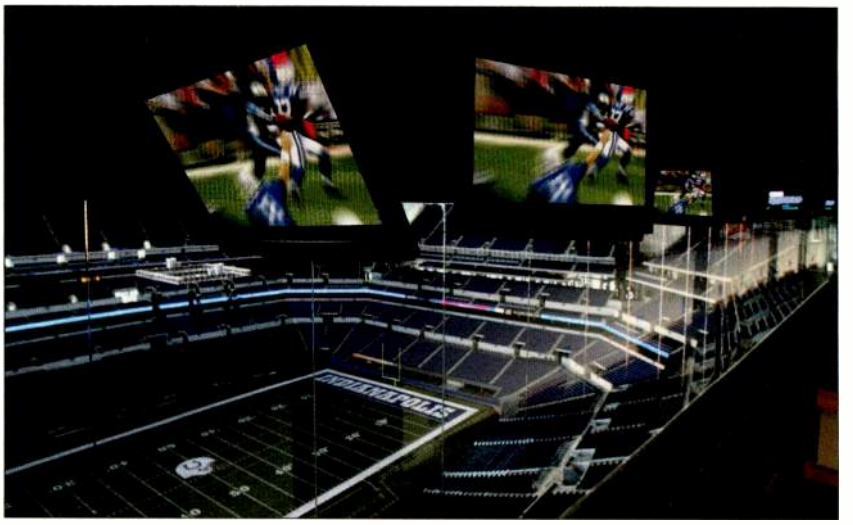
Belden cabling

Lucas Oil Stadium uses Belden's end-to-end communications network.

BY STEVE LAMPEN

Lucas Oil Stadium, home of the Indianapolis Colts, is a prime example of the trend toward construction of multipurpose facilities designed to host year-round national and local conferences, trade shows and public events, such as concerts, rallies, and high school and college sports championship tournaments.

The stadium offers seating for 63,000 fans and features two massive scoreboards with HD-quality video displays, a large ribbon board and a retractable roof with panels that open from sideline to sideline. The multilevel facility also houses a retail store, 58 concession stands, 137 hospitality suites, club lounges, an exhibit hall, offices, meeting rooms, a press room and a press box.



The entire A/V system is controlled from the stadium's press level. Here in the press box, sportscasters can view the playing field live while simultaneously viewing close-ups of the action on their TV screens.

Network, broadcasting and A/V cabling

Wrightson, Johnson, Haddon & Williams (WJHW) of Dallas, TX, designed and coordinated installation of the building's electronic systems. Belden was selected as the cable supplier. To install the cabling system, WJHW chose Ermco/Sachs, a joint venture partnership between Sachs Electric Company (St. Louis) and Ermco (Indianapolis).

The cabling and connectivity infrastructure supports integrated networking, data/voice communications, audio/video, CATV, A/V control and building management systems.

Belden IBDN structured cabling, both fiber and copper, was installed in a standard star topology. The data backbone includes more than 30,000ft of Belden FiberExpress single-mode tight-buffer fiber-optic distribution cables. Nearly 1 million feet of plenum 1874A MediaTwist Cat 6 UTP cable was installed from the telecom rooms to approximately 2500 telecom outlets. This cable is based on twisted-pair technology to support data standards such as 10BASE-T, 100BASE-T and GigE networking. Its design provides robust multimedia performance, so it can also be used in applications such as analog or digital A/V, machine control and broadband. The voice backbone comprises a total of more than 80,000ft of 25-pair, 50-pair and 100-pair Cat 3 UTP cables.

For the broadcast and A/V systems, about 64,000ft of FiberExpress single-mode tight-buffer fiber-optic distribution cable was used. The cabling is primarily used for HD camera transmission. The local TV and network TV broadcasters use it to transmit their camera signals, through various interconnects, from inside the building to their satellite vans. Fiber-optic cabling also is used for the video replay system. This cabling is run from the field to the scoreboard control room in the press box. These cameras provide various camera shots throughout the building onto the field in addition to the beauty shot, which looks outside the retractable north wall to the city.

The cameras use more than 7000ft of 7804R fiber-optic HD-SDI cable. These SMPTE 311M HDTV cables are made with tight-buffer single-mode fiber and have four 20AWG auxiliary power conductors, per traditional design parameters. The fibers permit long-haul transmission of critical audio and video signals. They are smaller and lighter than traditional camera cables, resulting in easier handling during installation and in field applications. The SMPTE cabling is primarily used for stationary cameras throughout the bowl. It is run from the field locations (camera platforms) directly to the rack in the scoreboard control room in the press box.

For video, more than 40,000ft of 1695A low-loss plenum serial digital coax is used to achieve the performance required for high-frequency

transmissions over long distances. Solid bare copper center conductors provide impedance stability and high return loss (RL). To ensure SMPTE performance standards or better are met, Belden's HD cables are 100 percent sweep tested to 3GHz, with a minimum RL of 23dB from 5MHz to 850MHz and 21dB from 850MHz to 3GHz. The cabling runs from broadcast boxes in the field to local and network racks in the basement of the stadium. It also serves as an analog backup in case the digital cameras do not work or are not available.

For loudspeaker wiring, 175,000ft of 6T00UP 10AWG, 186,000ft of 6000UE 12AWG plenum and more than 83,000ft of 5000UE 12AWG riser-rated loudspeaker cable were installed. Also installed was 84,000ft of custom 8AWG loudspeaker cable for high-power and long runs. For line-level audio, installers used 37,000ft of 88760 single-pair plenum twisted pair and 70,000ft of 82778 six-channel plenum audio snake with 27,000ft of 4-9-12-pair versions. More than 20,000ft of various AES/EBU digital audio single-pair and snake cable was used from the 1800 series.

More than 40,000ft of 1189AP RG-6 plenum coax was used for SMATV cabling, and more than 170,000ft of 1585A Cat 5e data cable was used for Ethernet network applications. The Cat 5e cabling is used strictly for broadcast communications between the field boxes and the local and network TV station racks. These are used for communications to the satellite trucks from inside the building.

The broadcast cabling system connects the main TV and ENG rooms, field broadcast cable boxes, outdoor pedestals, and press level locations. The entire A/V system is controlled from the press level and uses amplifier racks throughout the facility, which are also connected via single-mode fiber-optic cable. Four amp rooms, one in each quadrant of the building, are on the mechanical mezzanine level. They are used to power the main loudspeaker clusters and the large delay loudspeakers.

Finally, there are "JBC" boxes that are used for communications from the coaches on the field to the coaches in the press box. All cabling for the JBC box is a direct home run between the coaches with no splices allowed. This is an NFL requirement in order to minimize the possibility of communications being monitored by outside sources.

The project was completed in August 2008, and Lucas Oil Stadium opened in time for the Indianapolis Colts' season kickoff. **BE**

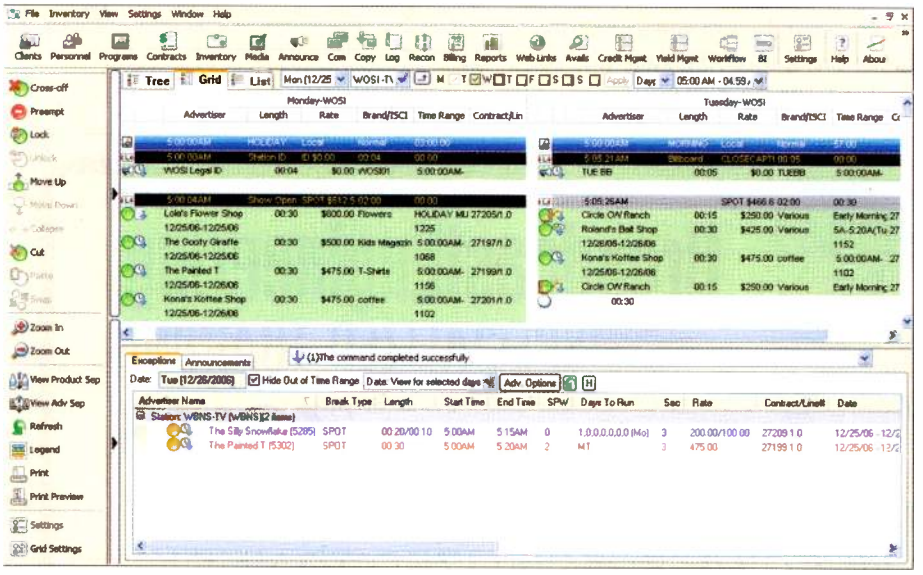
Steve Lampen is multimedia technology manager at Belden.

Master control rooms

Rather than switching to lights out, unmanned operations, broadcast stations still require an engineer.

BY JOHN LUFF

I'll dispense with rhetorical questions like, "Whatever happened to manual master control?" The plain answer is nothing. We seem to have a perception that automation has replaced humans. To a degree it is true. In today's multichannel world, more channels cannot equate to more operators. The economics of broadcasting just won't permit the ever higher cost that additional labor will always bring. This has thrust automation into the mainstream of broadcast technology for good. But it is important to note that in many, perhaps the vast majority of, installations, there still is an operator present. The key fact is that what they do is different.



Harris' ADC automation software uses BXF to seamlessly merge automation with sales, traffic, scheduling, asset management and other applications.

The need for human intervention

Today, a multichannel master control may not have "moving parts," i.e. videotape, or if I dare date myself, certainly not the film chains used for much of the broadcast content in the early decades of television broadcasting. We don't get spots on videotape much anymore either, because they are often delivered electronically to an IT-based server in the station, which then either moves the content (essence and metadata) to the air server via FTP, or perhaps plays it out for ingest in the server. In virtually every station, spots are stored on a server, even if long-form content is still played from videotape. At some level, automation is required to play back a server, essentially without exception. There are no control panels for button pushers to interact with. Though you could technically plug in an RS-422 control panel to almost any server and get a clip (spot) to play, the likelihood is that either a full-blown automation system, or a simple playlist manager, is used to cue up spots and play them to air.

It is fair to ask why many stations have not gone to lights out, unmanned operations. For the most part, exceptions and late additions to the schedule make unattended operation risky, or perhaps less than a career-enhancing decision. Content must be ingested and trimmed before it is used for air. In an era where file-based workflow is becoming mainstream, one might conjecture that passing metadata directly to automation and traffic will take away a primary function of the MCR operator. But someone still needs to take responsibility to make sure the content has been reviewed and noted as correct and ready for air. Consider for a moment an error in the file domain, which might render content at best embarrassing.

For example, let's say the content is properly marked, and audio and video are sampled for automatic QC and proved to be worthy technically of your valuable airtime. But what if one thing was wrong and could not be identified without a human's intervention? For instance, what if audio is present, but it is Spanish instead of English? Or perhaps it is the wrong "Sesame Street" episode with metadata that doesn't match? Only the human in MCR, or someone else in the station, can spot the error and even then only if they play the content to a monitor and listen to the audio.

I recognize that this might seem a bit contrived, but as we move further into file-based workflow, such issues beg for human solutions. One of my clients is actively considering what might seem counterintuitive — eliminating master control as a department and moving it into the traffic department. This has considerable business appeal. The schedule starts in traffic, and in this era, MCR can be run entirely from (or even on) IT hardware, eliminating the need for a different type of technical space for MCR. This is not just

window dressing, because who can better judge if a spot is the right one? Indeed who can gauge a program to be sure it matches the log?

Merging traffic and automation

This raises many questions that are not so obvious. Is this combining traffic with MCR or creating a more natural broadcast operations department? It is arguable that from a business perspective, this is a potential way to improve operations. If a log problem is spotted, it can be corrected by the people best equipped to understand the ramifications. Conversely, with technically savvy operators as part of one cohesive team, doesn't the ability to prevent potential problems get enhanced?

But the most intriguing aspect is that perhaps we are approaching a time when the software itself should be "merging." One manufacturer, which sells both traffic and automation software, has a platform with tight links between traffic and automation modules. This makes great sense. I like to think of traffic as building a template and automation as a step that adds macros to make it run automatically. Automation is the machine control engine, and traffic is the planning tool. Link them tightly, and you get much more power. It would be elegant if we could make automation calls from traffic software and traffic calls from automation software.

This holy grail is not a new concept. In a burst of creative engineering and understanding of the business imperatives faced by both vendors and broadcasters, SMPTE started a development project several years ago that went a long way toward tightly coupling automation and traffic. The BXF standard, first published in 2008, and now "BXF 2.0," provides communications "API" to which both traffic and automation vendors can build products that allow tighter integration and interoperation between pairs of companies without reinventing the wheel every time a user asks for a different vendor combination, or even set of supported options. BXF 2.0 will extend the solid work of the BXF standard (SMPTE 2021).

It is important to note that BXF allows defined interconnections among many broadcast business applications, including program management, traffic, automation and content distribution. BXF 2.0 will extend the metadata mapping to include how metadata transported by BXF and essence transported in an MXF wrapper can be more tightly coupled, improving the tight coupling that file-based workflow really needs.

One final thought. The right video/wrong audio example I mentioned may be prevented in the future using "hashes," or fingerprints, which uniquely identify content and substantiate that it has not been corrupted. The Advanced Media Workflow Association (AMWA) is considering an Application Specification that would provide an end-to-end system for content verification. BE

John Luff is a broadcast technology consultant.

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

Cobalt Digital — +LM

Audio loudness meter system is developed for use with the Fusion3G and 9000 Compass series cards for openGear; provides a flexible, comprehensive solution for ingest or on-air loudness metering and assessment; features true peak-level detection, error tracking and logging, and intuitive interface with touch-screen control; ensures thorough audio level and LKFS assessment information with ATSC A/85 and ITU BS.1770 compliance; software can be ordered with product purchase or activated later.

800-669-1691
www.cobaltdigital.com

Chrosziel — ALADIN Mark II

Eight-motor remote control for 3-D rigs features an intuitive operation concept with feedback on display, a spectrum analyzer that indicates field intensity of the selected channel and reveals possible interfering signals in the complete transmission range, and a USB interface.

+49 89 90 10 910; www.chrosziel.com

Radiall — MML Series

Series of connector solutions includes plugs, receptacles, jacks, adapters, pigtails and cable assemblies; addresses market demand for smaller, miniaturized connectors for applications such as WiFi access points, GPS and other mobile terminals; features two types of PCB receptacles and three corresponding types of space-saving plugs with mated heights of 2.5mm, 2mm and 1.5mm, and operating frequency range of DC 6GHz, and a typical VSWR of 1.35; offers cable assemblies with three RoHS-compliant 50Ω high-performance cables: 1.3mm for MML H2.5, 1.13mm for MML H2.0 or .81mm for MML H1.5.

480-682-9400; www.radiall.com

Snell — Morpheus ICE v2

Updated automation system boasts an expanded feature set and full ratification for running in a virtual machine environment; includes enhanced join in progress to help broadcasters manage overruns in live events and a new Media Ball configuration tool, which assists in taking new channels to air more quickly; supports 720p and closed captioning.

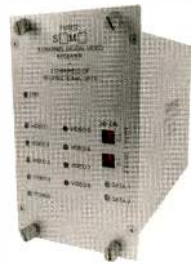
818-556-2616; www.snellgroup.com

DELTACAST — DELTA-hd-e 40

Four-channel video card doubles the per-slot capability of PCIe cards to ingest SD or HD-SDI channels to a PC server; offers audio and time code de-embedding, ANC and VBI extraction, uncompressed 8-bit/10-bit/12-bit digital video capture and playback, and system development tools for Windows and Linux environments; supplied in a package with the VideoMasterHD OEM SDK and integration support from DELTACAST.

702-275-6353; www.deltacast.tv

ComNet — FVT/FVR812



ValueLine fiber-optic video/data multiplexer meets demand for a cost-effective fiber-optic solution; transmits eight channels of digitally encoded video with two data channels over a single optical fiber.

203-796-5300; www.comnet.net

Harmonic Rhozet Carbon Coder 3.15/Carbon Server 3.15

Updated transcoding systems feature read/write of CEA-708 HD captions in VANC for Grass Valley GXF files, support for CEA-708 captions in MPGE-2 transport streams, caption conversion from CEA-608/analog to CEA-708/DTV, multiple audio programs for Windows Media output, MXF SMPTE 436M VBI reading, extended teletext and STL caption file support, and MPEG-2 transport stream API demultiplexer.

800-788-1330; www.harmonicinc.com

Vaddio — OneLINK

Digital bus technology passes power, video and control over a single bidirectional Cat 5e cable; provides a bidirectional control channel for RS-232 communication transmitting/receiving uncompressed digital video up to and including 1080p/60Hz; designed for 12V DC PTZ cameras with digital outputs that use RS-232 for control; comprises the EZIM OneLink, which sits at the PTZ camera end and includes the HDMI transmitter, power regulator and bidirectional control channel for RS-232, the Quick-Connect OneLINK, which sits at the headend and includes the HDMI receiver, power supply for the camera and the bidirectional control channel for RS-232, and Cat 5e cable.

800-572-2011; www.vaddio.com

Metaglue — MXFactory v3

Software creates Avid-compatible MXF files from a wide range of video formats; can be used as both a stand-alone system and in integrated workflows to speed up the ingest process; enables users to drag and drop AAF files into Media Composer bins; provides improved colorimetry and quality of Avid DNxHD material; accepts either 601 or RGB input.

781-862-2106; www.metaglue.com

Clear-Com — HelixNet

Intercom platform consists of the HelixNet Main Station (HMS-4X) and HelixNet Beltpacks (HBP-2X); based on Clear-Com's I.V. Core technology; breaks down the silos of separate intercoms and allows operators to seamlessly connect and control multiple system connections on a single communications platform; all systems on the platform are designed to work on common, standard cabling, such as microphone cables, Cat 5 and fiber; also can connect into a facility on a standard LAN/IT network infrastructure without new wiring.

510-337-6600; www.clearcom.com

Element Technica — Pulsar

3-D camera rig is designed to stereoscopically mount midsized and box-style digital cameras such as the Scarlet, Epic, SI-2K and Sony EX3 and P1 mounted with any ENG-style lenses; constructed with aircraft-grade CNC machined aluminum, stainless steel and carbon fiber; can be quickly set up and precisely aligned, configured in side-by-side or beam-splitter modes; is camera-agnostic.

323-641-7327
www.elementtechnica.com

Hi Tech Systems — clipR

Windows application simplifies the movement of video clips between a range of broadcast servers and Avid or Apple Final Cut Pro editing systems; powered by Marquis Broadcast's Media Highway; improves file-based workflows by providing fast, reliable media transfers without file incompatibility problems; integrates with Hi Tech's active Filer server control panel, which enables operators to build highlight lists of clips that can be edited prior to the chosen media being exported directly from the server to the editing system; supports DV25, DVCPRO 25/50 and IMX 30/40/50 SD formats, DVCPRO 100 and XDCAM 50 HD formats, and Grass Valley K2, Harris NEXIO, Omneon and SeaChange video servers.

+44 1256 780880
www.hitechsys.com

Pixel Power — Automated Transition Logic

Automated graphics system simplifies operations and reduces the possibility of graphical playout errors; allows templates to modify their appearance automatically in response to changes in one or more of the objects within the template; ensures that a single template can accommodate dynamic changes to data or graphical objects without the need for external intervention or the creation of additional templates.

818-276-4515; www.pixelpower.com

NOA Audio Solutions — mediARC 1.5

Upgraded audio archive management solution includes expedited cataloging, a more user-friendly interface, better responsiveness, greater security, enhancement to the linking clipboard to support faster and easier batch cataloging, enhanced workflow management with a new import/export tool, customized logging procedures that include orders per item and orders according to chronology, and additions to the built-in report generator, including flexible report templates.

+43 1 545 27 00; www.noa-audio.com

Polecam — HRO 69

High-quality 3.5mm lens is designed for use with the latest 1/3in miniature three-CCD HD cameras; features 3.5mm focal length, 69-degree horizontal angle of view, F2.2-F16 aperture range, back focus, a special bump cover to protect the lens front and 40.5mm filter thread adapter option; includes stainless steel locking screws for aperture and focus adjustment, as well as spare lens caps.

+44 1234 855 222; www.polecam.com

Roland Systems Group — M-300 V-Mixer

Digital mixing system features 32 mixing channels, left/center/right outputs, eight aux buses, four matrices, four-band PEQ and dynamics on all channels, 11 built-in multieffects/PEG and delay on all outputs, 24-bit AD/DA for high-quality sound remotely controllable from a PC, record/playback from USB flash memory, and integration with Digital Snake for high-quality audio transmission, distribution, splits and merging.

800-380-2580; www.rolandsystemsgroup.com

Sachtler — artemis Cine HD Pro

Cine system features dual video processing, which allows HD-SDI and SD video signals to be used simultaneously; offers hot-swap technology and HiCap wiring, which keeps power loss extremely low and allows for a longer battery operating time; has a new 1.8in post with matching gimbal; can be expanded with various modules.

845-268-0100; www.sachtler.us

Autoscript — i-Plus

Prompting software application interfaces with WinPlus News or Studio software; enables downloading or transfer of scripts or run orders directly to the prompting device.

203-926-2400; www.autoscript.tv

Blackmagic Design Smart Videohub

1RU routing switcher features 3Gb/s SDI, auto switching SD, HD and 3Gb/s, as well as full SDI reclocking; includes crystal-looking buttons on the front, with 16 buttons for destinations and 16 buttons for sources; front panel can be removed to allow labeling of buttons; all buttons are illuminated by brilliant white LEDs; when used in dark rooms, all buttons can be backlit so button labels can be clearly seen; includes control interfaces for USB, direct Ethernet and RS-422 serial.

408-954-0500
www.blackmagic-design.com

Marshall Electronics — V-MD-151-OLED

120Hz OLED monitor uses an HD 15in 1366 x 768 120Hz OLED panel housed in a rugged metal enclosure; this panel technology provides a wider range of colors, gamut, contrast and brightness; a wide 180-degree viewing angle makes colors appear accurately without shift, while providing true blacks; features low power consumption and fast response time.

310-333-0606; www.lcdracks.com

Brick House Video — ShowTime

Server control/vision switcher system seamlessly integrates live sources and action replay; comprises Hi Tech server controllers, Brick House Video's digital vision switchers and proprietary software; works with any video server that responds to existing industry protocols; features a wide range of control panels; performs to full broadcast specifications with live asynchronous inputs and a wide range of auxiliary monitoring and other features included as standard.

+44 1962 777733
www.brickhousevideo.com

Canon — HJ15ex8.5B KRSE-V

HDTV portable zoom lens combines HD with an optical image stabilizer function; four stabilization modes are available to meet different shooting conditions; with the company's original optical design, curvature of the field, chromatic aberration and other types of aberrations are easily corrected; flat and high-resolution/contrast image is possible through the whole zoom range covering from wide-end to tele-end.

800-652-2666; www.usa.canon.com

Atlona Technologies — HDAiR

USB-to-HDMI wireless converter allows any user with a computer to connect wirelessly to any HDTV or VGA monitor; outputs audio in both 3.5mm analog as well as embedded on the HDMI output; enables users to connect up to four receivers to a single transmitter; supports Windows and Mac OS; extends any computer wirelessly from the display at lengths up to 30ft with HDTV resolutions up to 720p or PC and VESA resolutions at 1440 x 1050; can be used to power up to two displays at the same time with identical content because both HDMI and VGA output connections are active at the same time.

877-536-3976; www.atlona.com

Gennum — GX3290

Low-power, high-speed 290 x 290 crosspoint switch is designed to drive and receive high-speed signals through backplanes; consumes as low as 34W of power with all channels operational; features broadcast and multicast modes, support for data rates from DC to 3.2Gb/s, dynamic on-chip power management control, independent programmable output de-emphasis for driving long-board traces, video-optimized control for multiformat applications, built-in system test features with on-chip PRBS Tx generators and Rx analyzers, 2.5V analog core voltage, 1.8V digital core voltage, input and output voltages that support either 1.2V or 2.5V CML, JTAG-controlled boundary scan, selectable parallel/serial host interface and RoHS compliancy.

905-632-2996; www.gennum.com

Omneon — Media Applications Server

System enables enterprisewide visibility and coordinated management of content; ensures that content across an environment can easily be managed, accessed and processed from a centralized platform; functions as an intelligent middleware layer between media content stored across multiple storage systems or video servers and the applications that are used to access that content or perform media processing tasks on content as it moves through its life cycle; application servers provide improved efficiency through centralized administration and configuration, centralized security for controlled access to content, a standardized metadata model and a common messaging bus.

408-585-5000; www.omneon.com

NTT Electronics — HDVE-100 Encoder SDK

Software development kit provides functionality for H.264/AVC video encoding with high visual quality and compression rate; supports MPEG-4 H.264/AVC Baseline, Main and High Profile as well as image resolutions up to 1920 x 1080, SMP with complete multithreading, high-speed processing with SIMD instructions and the ARIB STD-B1 standard; features progressive/interlace encoding, automatic scene change detection, CBR rate control, two-pass VBR rate control, resizing of input image, application-dependent optimum parameter presets and adjustable encoding parameters.

201-556-1770; www.ntt-electronics.com

PHABRIX — Sx

Handheld test and measurement system includes an option for Dolby E metering, framing and metadata; once enabled, the option will automatically detect the Dolby E bit stream; up to eight channels carried by the Dolby E stream can be viewed simultaneously via the onboard PPM; option also indicates Dolby E framing by indicating the start and finish positions within the video frame, reporting any discrepancy across frames.

+44 1635 255494; www.phabrix.com

EVS-OpenCube — P2soft v2.3

Ingest gateway solution includes an MXF P2 content manager for Panasonic P2 file review, ingest, logging and transfer as well as a direct consolidation of the timeline into Avid Interplay, enabling editing while ingesting; allows users to manage file ingest and transfer to different destinations, such as playout servers and post production, at the same time.

+33 561 285 606
www.opencubetech.com

Riedel — Artist 1100

Control key panel for Artist digital matrix intercoms; features high-res color OLEDs, with 65,000 colors and a resolution of 140 dpi; the new displays provide readability and can show up to eight highly detailed characters of up to 24 x 24 pixels, ideal for displaying icons and Asian characters; definable marker colors for the keys complete the labeling options and provide instant function identification and signalization, e.g. for incoming calls.

914-819-0495; www.riedel.net

Sony — HDC-P1

HD POV camera can be used standalone or seamlessly integrated with content from full-size cameras; delivers high picture quality thanks to its use of the same technologies borrowed from Sony's larger HDC series studio cameras; three 2.2-million pixel, 2/3in Power HAD FX CCDs and a 14-bit A/D converter offer a sensitivity of F11 at 1080/50i; supports a wide range of recording formats, including 1080/50i, 59.94i, 720/50p and 59.94p; 23.98PsF, 24PsF, 25PsF and 29.97PsF capabilities are available via optional software upgrades.

212-833-6800; www.sony.com

Grass Valley — NetProcessor 9030/40

Multiplexer offers the power of several multiplexers in one unit, allowing operators to reduce CAPEX and OPEX; is scalable to fit any requirement; features include a wide range of interfaces, full CAS support, embedded SFN or DVB-T2 gateway, and built-in program insertion capability.

818-729-7706; www.grassvalley.com

Genelec — 8000 series

Aluminium Minimum Diffraction Enclosure (MDE) two-way monitoring systems feature rounded edges that curve into the shapes of the Advanced Directivity Control Waveguide (DCW) and the large rear-opening of the reflex tube; the long, curved reflex tube is flow optimized to increase the woofer's low-frequency extension and SPL capacity; new low-distortion drivers and crossover filters result in improved resolution and less listening fatigue over the entire audio spectrum.

+358 17 813 311; www.genelec.com

Aberdeen — SAN-VA

AberSAN scalable storage platform plug-in combines Fibre Channel and iSCSI block-level connections with multiuser network sharing; provides a virtual SAN on a VMware ESX server by using internal disk resources on an AberSAN into a shareable pool of storage.

888-300-5545
www.aberdeeninc.com

Jünger Audio — T-APP

Wideband eight-channel audio processor focuses on automatic and adaptive loudness control using Level Magic (ITU compliant) and Spectral Signature; can analyze and reproduce the sound signature of your favorite show and using dynamic filters, automatically apply it to your own content; offers optional Dolby decoding and encoding (D, D+, or Pulse), metadata management, 5.1 downmix, and the company's UPMIX functionality.

+49 30 6777 210
www.junger-audio.com

Utah Scientific — Dot.Box

Combined dual-channel master control and routing system for broadcasters moving to multichannel operation; available with 32 x 32, 64 x 64 and 144 x 144 frame sizes; Dot.Box 64 and Dot.Box 144 are wired for future expansion of inputs, outputs and master control channels.

800-453-8782
www.utahscientific.com

Apantac — MT HOOD HDMI-8-SER

HDMI splitter/extender/receiver extends video signals with resolutions up to 1920 x 1080p at up to 115ft; allows up to eight HDMI displays to be connected to a single source via Cat X cables; multiple units can be cascaded together to extend the distance and output capability for up to 40 outputs.

503-616-3711; www.apantac.com

TV One — 1T-FC-677

Distribution amplifier, extender and HDMI converter allows SD-SDI, HD-SDI and 3G-SDI signals to be displayed on an SDI and HDMI monitor simultaneously; high-bit-rate processing of 2.970Gb/s ensures fast signals transmission without signal loss and allows greater flexibility in monitor selection; provides two equalized and reclocked 3G/HD/SD-SDI outputs independent of the HDMI output; supports up to eight channels of audio de-embedding; automatically detects and outputs SDI audio channels over HDMI as either LPCM 2.0 or LPCM 7.1; employs locking DC power connector to enhance overall system mechanical security.

800-721-4044; www.tvone.com

Calrec Audio — H2O

Management system for Hydra2 network router allows the user to control the Hydra2 network independently from any console control surface, set up routes and configure access rights to all desks on a given network, and label I/O boxes and ports for easy identification; can arrange ports into folders to make them quicker and easier to locate.

917-825-3728; www.calrec.com

LYNX Technik — OTX 5844

Four-channel, auto-detecting, electrical-to-SDI optical conversion transmitter module for Series 5000 card- and rack-based terminal equipment solution provides selectable signal reclocking on each channel, which helps to stabilize signals over long distances and supports SDI/ASI-DVB signals up to 3G/s; features non-reclocking mode that can be selected for each channel and CWDM compatibility; includes four SDI optical outputs and two SDI electrical outputs that can be mapped and reassigned using the integrated 4 x 6 matrix switcher.

661-251-8600
www.lynx-technik.com

Ross Video — NK series

Comprehensive family of routing solutions is available in a wide variety of matrix sizes and types, a selection of flexible control panels and a powerful control system; a full range (from utility to facility solutions) of crosspoint matrices are available in sizes from 16 x 4 to 320 x 320 and a wide range of types, including modular 72x, 144x and 320x designs; control system features distributed control architecture with no single point of failure, Phoenix control surface for configuration and monitoring, virtual routing and a range of highly flexible control panels.

613-652-4886; www.rossvideo.com

Miranda — NVISION 8500 Enterprise Class

Routers feature integrated audio processing, including de-embedding, shuffling, breakaway and re-embedding capabilities; use new hybrid switching technology, which allows every frame in the router family to de-embed, route and re-embed up to 16 channels of mono audio per video input and output in a completely nonblocking audio/video switch.

514-333-1772; www.miranda.com

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

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
Vice President of Production: Lisa Parks, lisa.parks@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 Media

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

PHOTOCOPIES: Authorization to photocopy articles for internal corporate, personal, or instructional use may be obtained from the Copyright Clearance Center (CCC) at 978-750-8400. Obtain further information at copyright.com.

PRIVACY POLICY: Your privacy is a priority to us. For a detailed policy statement about privacy and information dissemination practices related to Penton Media products, please visit our Web site at www.penton.com

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

Axon Digital Design — G3D100

3Gb/s HD and SD stereoscopic production and transmission tool can be sourced with a stereoscopic image (and a backup source); these sources are processed internally to provide multiple outputs, and they are compatible with 270Mb/s, 1.5Gb/s and 3Gb/s for full 1080p/50 or 1080p/59.94 application.

212-683-6724; www.axon.tv

Isilon Systems — OneFS

Scaled-out storage platform operating system combines file system, volume manager and RAID into one unified software layer to create a single intelligent file system that spans all nodes within a cluster; enables independent or linear scalability of performance and capacity to more than 45GB/s of throughput and more than 10.4PB of capacity in a single file system, a single point of management for large and rapidly growing repositories of data, and mission-critical reliability and high availability with sophisticated data protection; delivers cluster-aware symmetric multiprocessing that enables the system to move tasks between processors for more efficient workload balancing.

206-315-7500; www.isilon.com

Linear Acoustic — AERO.mobile

Audio loudness manager for DTV provides wideband and multiband processing, frequency tailoring, and psychoacoustically-based compensation for background noise effects and hearing-impaired viewers; delivers viewers a satisfying experience appropriate for widely varying individual listening environments; standard I/O is AES3id; options include built-in Dolby Digital (AC-3) encoding, HD/SD-SDI I/O and redundant power supplies.

717-735-3611
www.linearacoustic.com

Sennheiser — SKM 5200-II

Handheld transmitter provides sound engineers with expanded switching bandwidth of up to 184MHz; features adjustable sensitivity from 40dB to zero in 1dB steps and a three-position low-frequency filter; operates in low intermodulation mode, which increases the number of usable channels in crowded RF environments, standard 10mW mode to extend operating time and 50mW to increase the transmitter's range.

860-434-9190
www.sennheiserusa.com

Triveni Digital — StreamScope MT-40LCP

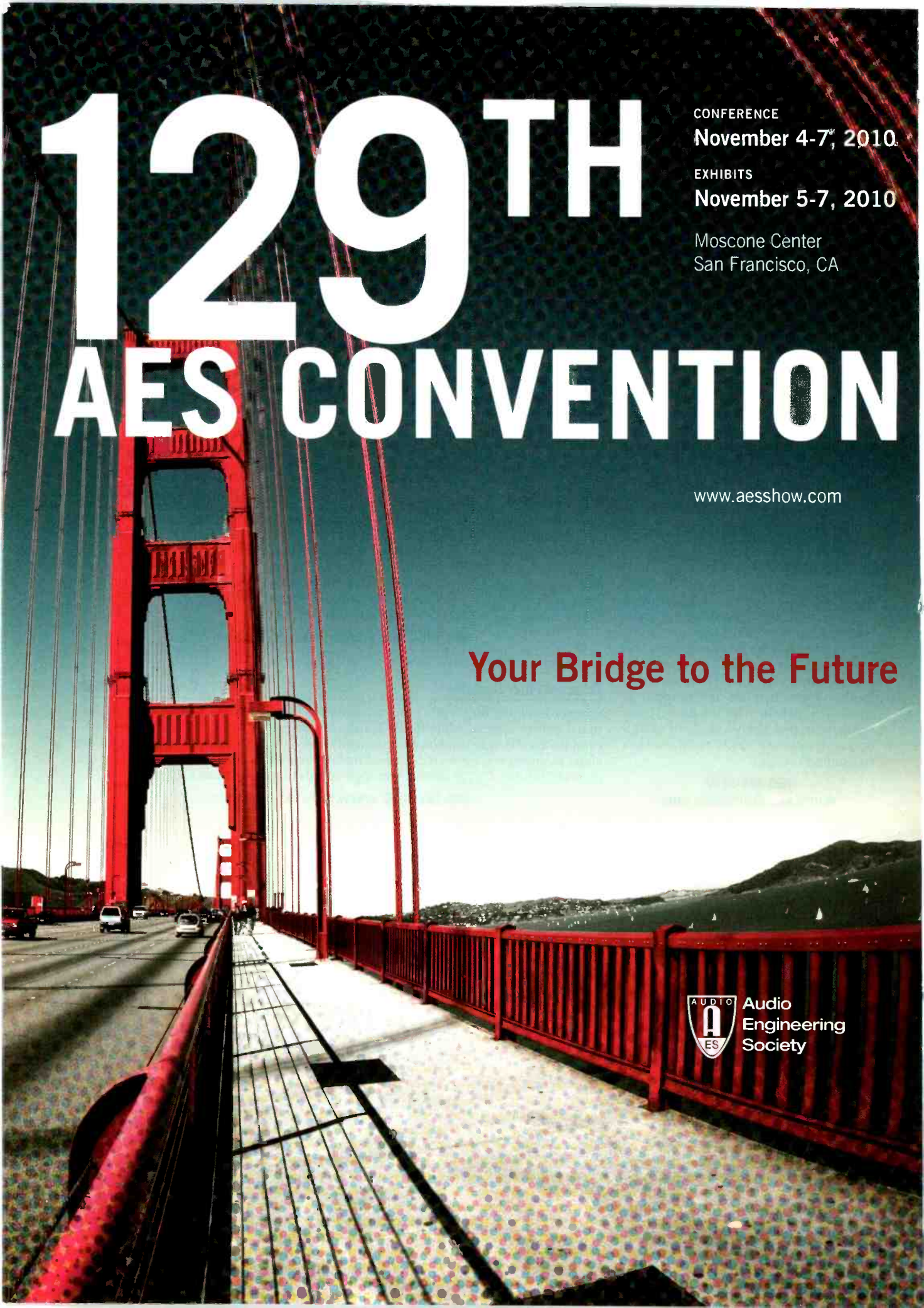
Low-cost version of MT-40 analyzer facilitates end-to-end MPEG-2/MPEG-4 transport stream monitoring and analysis for DTV signals; features two PCI card slots, a reduced size and weight, and an optional battery-equipped unit; supports options for RF, SMPTE 310, ASI, QPSK, file inputs and GigE; can monitor, alarm, troubleshoot, record and measure DTV transport streams; includes remote monitoring, EPG display, PSIP and PSI crosstable consistency checking, SD/HD video thumbnails, closed-captioning, IP route analysis, and IGMPv3 for IP multicast support.

609-716-3500; www.trivenidigital.com

Telecast Fiber Systems — CopperHead 3050

Camera-mounted fiber-optic transceiver sandwiches between the camera and professional battery system, while the 1RU base station mounts in the truck; delivers uncompressed HD video and broadcast-quality audio from the camera, returning off-air video, intercom and a powered IFB feed that works with a standard IFB belt pack for the reporter; features 10/100 Ethernet for high-speed connection to an ENG truck.

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


129TH
AES CONVENTION
CONFERENCE
November 4-7, 2010
EXHIBITS
November 5-7, 2010
Moscone Center
San Francisco, CA
www.aesshow.com
Your Bridge to the Future
AUDIO
A
ES
Audio
Engineering
Society

For Sale

Invitation to Bid

INVITATION TO BID SALE OF SURPLUS STUDIO & MASTER CONTROL EQUIPMENT by
FLORIDA GULF COAST UNIVERSITY
OFFICE OF PROCUREMENT SERVICES
10501 FGCU Blvd South • Fort Myers, FL 33965-6565

Competitive sealed bids will be received by the Office of Procurement Services for:
Invitation to Bid: 10M-S-2 – Sale of Surplus Studio & Master Control Equipment
Opening Date and Time: October 12, 2010 at 2:00 p.m. ET
Bid becomes available for pick-up or on web: September 9, 2010

An Invitation to Bid may be obtained by going to our website **http://www.fgcu.edu/AS/Purchasing/current-bids.html** or by calling Procurement Services at (239) 590-1130. The Office of Procurement Services reserves the right to reject any or all bids.

Americans with Disability Act of 1990 – If special accommodations are needed in order to attend the bid opening, contact the Office of Adaptive Services at (239) 590-7956 prior to the scheduled bid opening date and time.

Help Wanted

VICE PRESIDENT ENGINEERING
WFXT Fox25/Boston, MA (Fox O&O)

Direct and manage the technical stability of the station. Manage and maintain operations of all technical equipment, including news, production, transmission facilities, and master control operations. Manage and coordinate all short and long term technical projects. Supervise and lead staff to maximize productivity and performance. Prepare departmental expense and capital budgets. Ensure the station's technical compliance with all government regulations and industry standards.

Minimum of five to seven years engineering management experience in a television broadcast environment required. Extensive knowledge of all broadcast systems, and knowledge of FCC regulations. Understanding of digital technology and significant technical expertise in the planning, implementation and maintenance of television station facilities. Must be a strong leader with solid interpersonal skills to direct and motivate staff. Degree in related field strongly preferred.

Qualified candidates, send résumé and cover letter to: Human Resources – BE, WFXT Fox 25, 25 Fox Drive, P.O. Box 9125, Dedham, MA 02027.

For immediate consideration, fax your resume to: 781-467-7212, or e-mail as an attachment in MS-Word format only to: **jobs@myfoxboston.com**. *No Phone Calls Please.*
EOE/M/F/D/V

For Sale

AD INDEX

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

	Page #	Advertiser Hotline	Website Address
AES Show	80		aesshow.com
AJA Video	29	800-251-4224	aja.com
American Portwell Technology	45	510-403-3399	portwell.com
Apantac LLC	30	503-616-3711	apantac.com
Avid Technology	3	800-949-AVID	avid.com/mmm
Blackmagic Design	5	408-954-0500	blackmagic-design.com
Calrec Audio Ltd.	63	+44(0)1422842159	calrec.com
Canon U.S.A. Inc.	11		usa.canon.com/camcorder
Cisco Systems	51-58		cisco.com/go/msb
Clear-Com Communication Systems	75	510-496-6600	clearcom.com
Cobalt Digital	77	800-669-1691	cobaltdigital.com
Communications Engineering Inc.	65	703-550-5800	commeng.com
Dalet Digital	31		dalet.com
Dell Inc.	15	1-866-306-3355	dell.com/smb/imagine
Dolby Laboratories Inc.	13		dolby.com
Enco	74	800-ENCO-SYS	enco.com
Ensemble Designs	39	530-478-1830	ensembledesigns.com
Evertz Microsystems Ltd.	IBC	877-995-3700	evertz.com
Fischer Connectors	59	800-551-0121	fischerconnectors.com
For. A Corporation of America	33	714-894-3311	for-a.com
Harris	BC	800-231-9673	broadcast.harris.com/multiviewers
Inter BEE 2010	47	+81-3-6212-5231	inter-bee.com
Junger Audio	72		junger-audio.com
Kino Flo	43	818-767-6528	kinoflo.com
Linear Acoustic	61	717-735-3611	linearacoustic.com
Matrox Electronic Systems	25	800-361-4903	matrox.com/video
Miranda Technologies Inc.	9	514-333-1772	miranda.com/nvision
NTT Electronics Corp.	26		ntt-electronics.com/be
Nucomm / RF Central	19	800-968-2666	imt-solutions.com
Omneon	21	866-861-5690	omneon.com/spectrumdelivers
Phabrix Ltd.	79	800-645-5104	leaderusa.com
*Professional Products Inc.	67-68	240-864-4000	professionalproducts.com
Renaissance Electronics Corp. / HXI	42	978-772-7774	rec-usa.com
Riedel Communications	23, 71	818-241-4696	riedel.net
Salzbrenner-Stagetec Media Group	50	888-782-4391	stagetec.com
Screen Service Broadcasting Technologies	IFC	888-522-0012	screenservice.net
Snell Group	35		hdforless.tv
Stratos	78	800-563-2255	stratosglobal.com
Streambox	27	206-956-0544	streambox.com
Studer USA	41	866-406-2349	studer.ch
TBC Consoles Inc.	34	1-888-console	tbcconsoles.com
Triveni Digital	73		trivenidigital.com
Utah Scientific	17	800-453-8782	utahscientific.com
ViewCast	7	800-540-4119	viewcast.com
Ward-Beck Systems Ltd.	22	800-771-2556	ward-beck.com
Zeus Broadcast	76	407-352-6501	zeusbroadcast.com

*Denotes ad placement in only selected editions of this month's magazine.

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

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, September 2010, Vol. 52, No. 9 (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.

Is 3-D another fad?

When it comes to 3-D, there is nothing new under the sun.

BY ANTHONY R. GARGANO

With some 25 movies being released in 3-D this year and 31 3-D movies on tap for 2011, Hollywood continues with unabashed enthusiasm over the latest incarnation of stereographic entertainment. With recent 3-D broadcasts of Major League Baseball's All-Star Game, FIFA's World Cup Soccer and NASCAR plus the launch of 3-D cable and satellite networks, neither is the broadcast community without its own version of 3-D fever. But just as some fevers have ebb and flow characteristics, the history of 3-D popularity is replete with Mount McKinley-like highs and Death Valley lows.

The birth of 3-D

Incredible as it sounds, 3-D was born even before photography. In June 1838, Sir Charles Wheatstone, familiar to most TV engineers for his invention of the Wheatstone Bridge, first described a process and a viewer that he named a stereoscope. The process was to prepare identical drawings that were slightly offset as a function of binocular vision and then view them through his stereoscope, resulting in an image that had perceived depth. It wasn't until 1839 that Charles Daguerre, normally credited as the father of photography, described his process for producing latent images, and latency was what all previous attempts at photography lacked.

Oliver Wendell Holmes' invention of the handheld stereograph viewer in 1859 started the first of numerous 3-D fads. This remarkably new experience of the time became wildly popular only to quickly fade.

The next 3-D fad came and went with the Victorian era. The then rising U.S. standard of living afforded many the luxury of steamship travel abroad and the enchantment with faraway places. Consequently, a well-appointed living room was not considered complete without handheld or floor stand-mounted stereo viewers and the requisite box of stereogram photos of scenes from London, Paris and the Egyptian pyramids. Once again, the 3-D fad peaked and faded, and it didn't seriously arise again until the 1940s. The iconic Gen. Dwight Eisenhower in victory photos with a Stereo Realist camera around his neck must have done wonders for Kodak's sales at the time.

The next 3-D fad of note occurred with the 1952 3-D release of "Bwana Devil." This film is often erroneously attributed as being the first 3-D movie. Actually, the silent film "Power of Love," released in 1922, was the first, and while it drew the curious, it could not ignite a 3-D fad. "Bwana Devil" drew huge crowds to the theaters, and it kicked off a spate of 3-D movies as varied as "House of Wax" and "Kiss Me Kate." But once again, the fad died out after several years.

In 1969, an attempt was made to rekindle 3-D interest with the release of the soft-porn movie "The Stewardesses." Though it became the highest grossing 3-D movie ever, even porn could not engender sustainable interest in 3-D at the time.

3-D today

That brings us to the current day, where we are in the midst of yet another 3-D fad. Unlike those of the past, today's fad, however, has multiple underpinnings. Today's 3-D entertainment is not just a film industry phenomenon. Abetting Hollywood in this latest foray into 3-D is computer gaming, Blu-ray packaged media and the broadcast TV industry. From newspapers running special 3-D insert sections to "Playboy" magazine's special 3-D centerfold, even the publishing industry is dabbling in 3-D. But the real push comes from the consumer electronics industry, where with HDTV now a mature market, receiver prices have dropped, sales have slowed and profits are down dramatically. Thus, the CE industry is motivated to create an aura around 3-D as the next new must-have product.

But has this current 3-D fad already run its course? The percentage of 3-D to 2-D gross box office receipts has been steadily declining this year, and 3-D TVs and Blu-ray players haven't been flying off the shelves. One major market research firm is projecting year-end 3-D TV household penetration at less than 1 million worldwide — a number lost in rounding given the hundreds of millions of TV households that exist worldwide. Not to be overlooked, this same research concluded that only 100,000 or so of those 3-D TV households would actually be viewing 3-D content.

So is 3-D technology a fad, niche entertainment medium or a new, permanent slice of the content delivery pie? It's probably too soon to tell. The Japanese are already trying to shore it up with the promotion of new 3-D porn titles. One only has to examine the early history of VHS to understand the impact that porn can have on new distribution media. Will porn drive 3-D to success? It hasn't in the past, but it will be interesting to follow this time.

In writing this column, an old Bible passage, applying equally to both porn and 3-D, kept coming to mind: "What has been will be again, what has been done will be done again; there is nothing new under the sun." BE

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

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

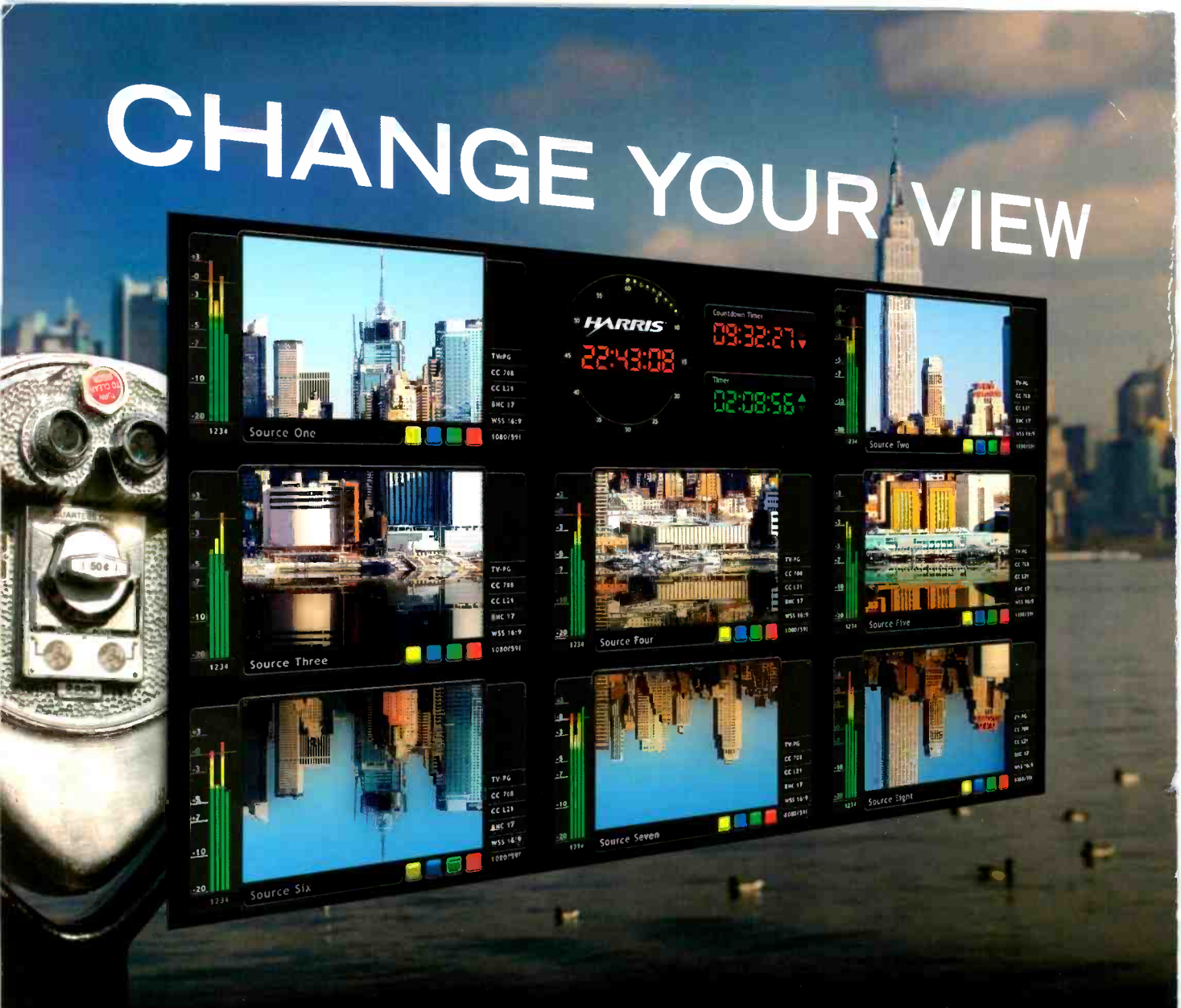
Magnum is the Evertz® solution for unifying the control and operation of the routing core, master control & branding, production switching, infrastructure, and multi-display processing.

Magnum Unified Facility Control presents users with a single point of configuration and control of multiple systems. Magnum's web-based interface and intelligent CP-2232E and CP-2116E-H control panels offer users better workflow, greater efficiency and lower costs for their facilities.

www.evertz.com • 1.877.995.3700

evertz

US West Coast Sales	New York Sales	Washington DC Sales	UK Sales	South-East Europe Sales	Dubai Sales	Asia Pacific Sales
818.558.3910	newyorksales@evertz.com	703.330.8600	+44 118 935 0200	+385-1-2059-325	011-971-50693-0204	+852 2850-7989
LAsales@evertz.com		dcsales@evertz.com	uksales@evertz.com	SEeuropesales@evertz.com	middleeastsales@evertz.com	asiapacificsales@evertz.com



See things differently with Harris multiviewers.

Award-winning multi-image processors from Harris deliver pristine pictures that will change the way you view your world. From a studio. In a master control suite. Or on a truck. Choose from the industry's widest range of solutions — all easily deployed into your workflow.

Harris multiviewers ... Look no further.

CHANGE YOUR VIEW™ **Learn more at www.broadcast.harris.com/multiviewers.**

ONE Company. ONE Direction. The Future.

HARRIS assuredcommunications®
Broadcast Communications • RF Communications • Government Communications Systems
www.harris.com