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MARCH 2012

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2012 NAB PREVIEW

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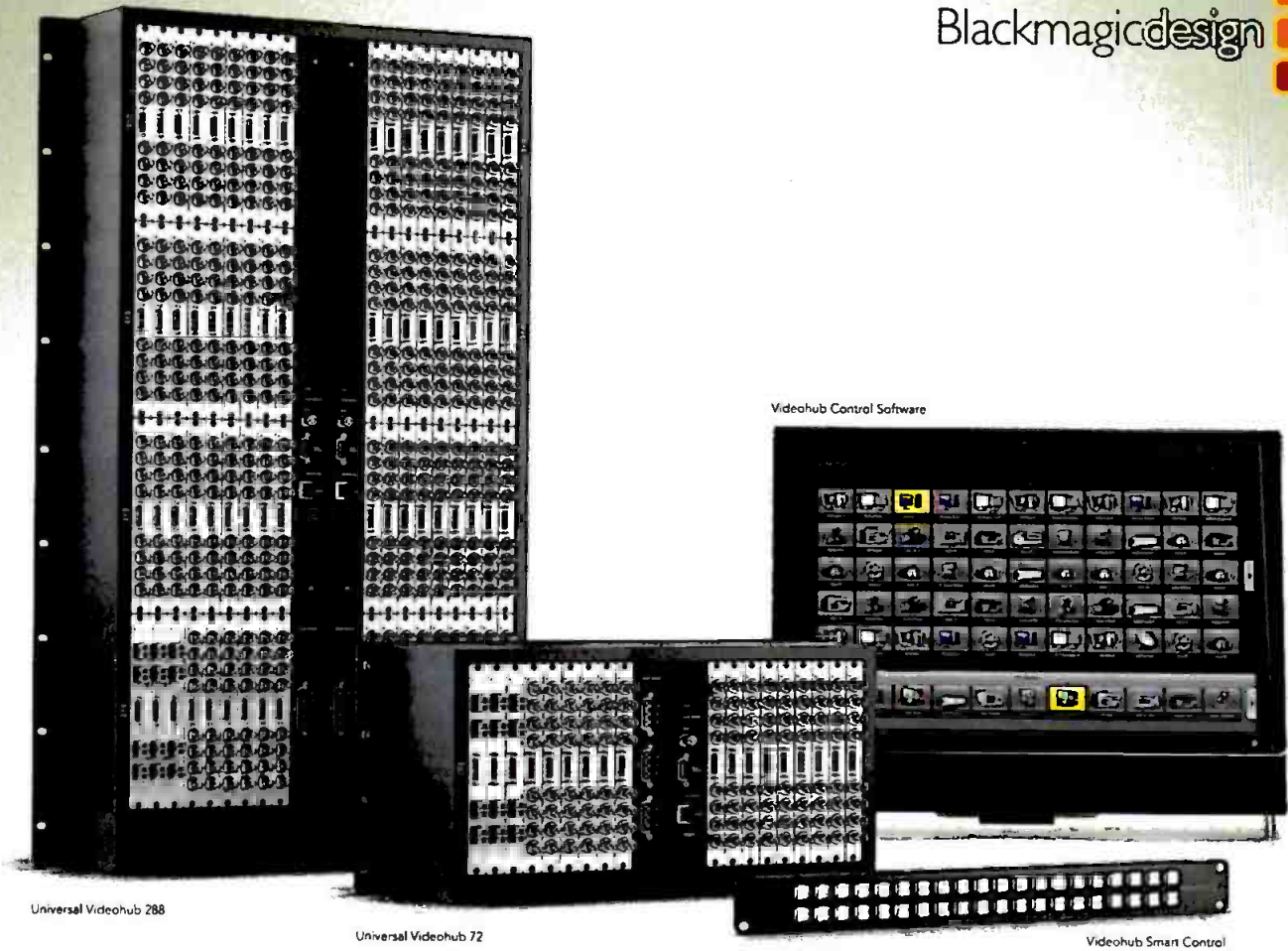
It's that time of year again — time for broadcasters worldwide to converge on Las Vegas to browse the industry's latest offerings.

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JUST THE FACTS!

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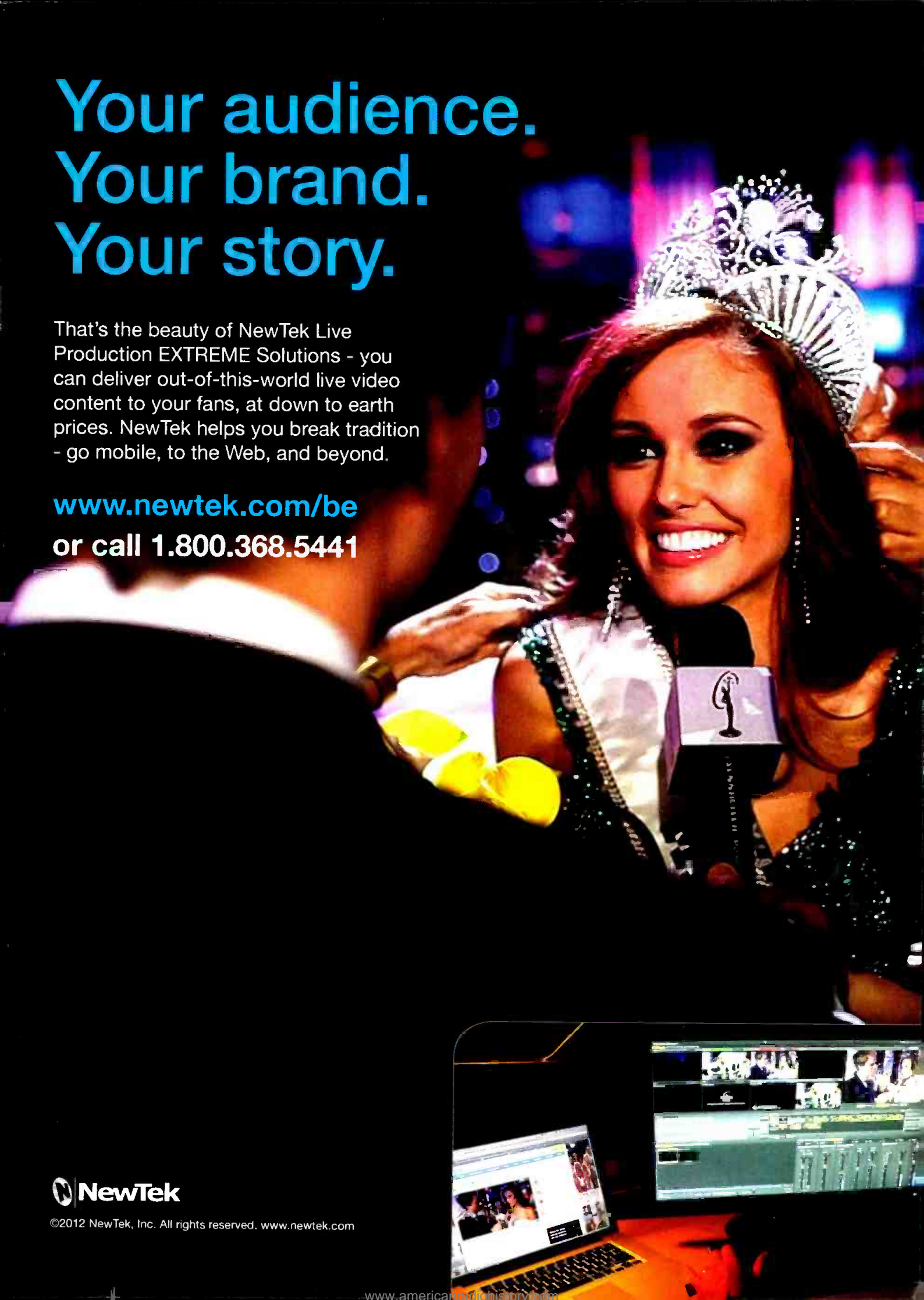
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NAB: Yes, you should go!

Friends know that I attend “some kind of convention in Las Vegas” every spring, but they have no real idea what it’s about or why I go. I’ve tried explaining all the work, hassle and effort required. It doesn’t help. All they hear is, “Convention means party!” This led me to ask: Why attend NAB?

While there are many reasons to attend any a convention, these first came to my mind.

1) SWAG! Come on, you know conventions are all about SWAG. Candy (maybe touched by hundreds of other fingers), buttons with flashing lights, luggage tags, maybe even a cap or tote bag. Sitting through a presentation will likely get you the better stuff. What’s the best SWAG you’ve received?



2) Bright lights and pretty people. Come on, gals and guys, you know the NAB camera sets and reception desks are staffed with both good-looking hunks and babes. Attractive people attract crowds. It’s marketing 101.

3) Party! Conventions are an excuse to let loose, have fun and trash your diet. Forget Michelle O’s food mandates; it’s time to eat, drink and have some (responsible) fun. Here’s a tip that can save a few bucks (Boy, am I going to receive heat for this tip!):

If you would like to partake of free beer and some hors d’oeuvres, vendors are ready to accommodate. Be on the lookout for late-afternoon exhibitor receptions. Most of them begin at 6 p.m., when the exhibition floor

closes. Your tip-off of an upcoming party will be convention hall staff converging on a vendor’s booth with carts of food and beverages around 5:30 p.m. Keep your eyes open for your favorite vendor to hold a party, and then invite yourself.

4) Hands-on experiences. This is the key reason professionals attend conventions. They attend to get some one-on-one time with gear, even with gear they’ll never be able to afford. That’s okay. Go on, put your mitts on that shiny new \$150,000 camera and zoom in on that model. You’ll never get to do that at home. Or, pretend you’re the TD behind that 500-button production switcher. Wow, feels cool doesn’t it?

How does one divide his or her limited time between seminars and exhibits? Although it’s great to attend seminars, most are available in printed and recorded form. You can always read the proceedings back at home.

What can’t be put in a book or whitepaper is the first-person experience of handling equipment and technology. Nothing replaces the hands-on examination of equipment and one-on-one dialog with vendors.

The show encourages visitors to see, touch and try out thousands of pieces of new equipment and technology. Don’t pass up this important opportunity. You’ll later hate yourself if you spent two hours in an esoteric seminar titled “DeBayer filtering and demosaicing algorithms” instead of checking out the *Broadcast Engineering* Pick Hit products.

Vendors spend millions of dollars bringing their products to the show floor. They want to meet you and allow you to see and touch their shiny new solutions. Don’t disappoint them.

BE

Broad Dish

EDITORIAL DIRECTOR

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LET'S GO THERE.

HDMI: plug and pray

The interface's consumer drawbacks can be overcome in the professional workplace.

BY PETER PUTMAN

HDMI, ubiquitous on a wide range of televisions and other consumer electronics equipment, is becoming established in the professional video world. You'll find it on camcorders, portable VTRs, media players, professional Blu-ray players, and reference and broadcast monitors. HDMI distribution amplifiers and matrix switchers are also widely available, as are HDMI to/from format converters.

Broadcasters are accustomed to moving around high-bit-rate video, audio and metadata through traditional serial interfaces (SDI and HD-SDI), unencumbered by copy protection keys and digital display handshakes. So the emergence of HDMI as a professional display interface is a major irritation as it does not lend itself well to multipoint distribution without some technical ingenuity.

The basics

As originally conceived, HDMI would be a plug-and-play digital video and audio interface between media

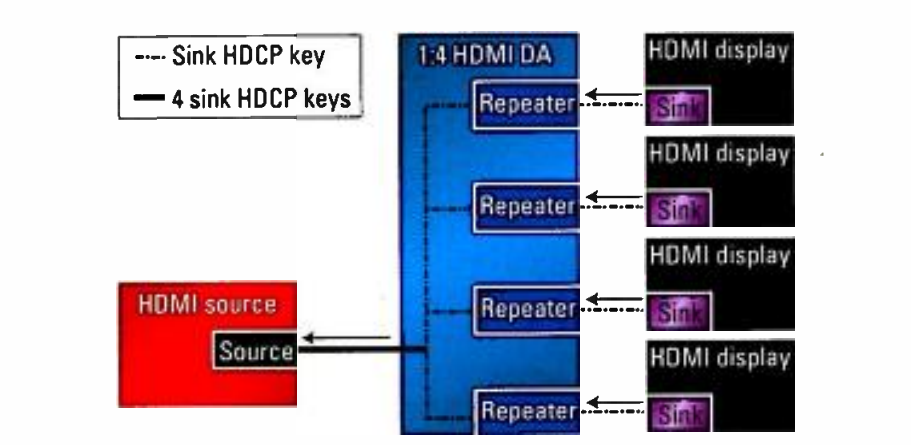


Figure 1. One approach to HDCP handshaking is for each display to communicate directly with the source. But if one display is not HDCP-compliant, or a key is corrupt, the source will not output to any display. Figures courtesy Kramer Electronics.

players and HDTVs, resembling an ad-hoc peer-to-peer network connection. In the decade since the HDMI standard was first announced, it has undergone numerous revisions and updates, with the latest being version 1.4b (October 2011).

Version 1.4 increases the maximum resolution to 4096 x 2160 pixels at 24Hz, and includes a 100Mb/s Ethernet return channel, along with support

for numerous 3-D picture formats (defined in 1.4a, March 2010). HDMI also carries up to eight channels of digital audio (linear pulse code modulation, 192kHz); supports sRGB, Deep Color and xvYCC color spaces; high-bit-rate digital audio; and an audio return channel. There are five different versions of the HDMI connector, with Type A (19 pins, slide-on) being the most widely implemented.

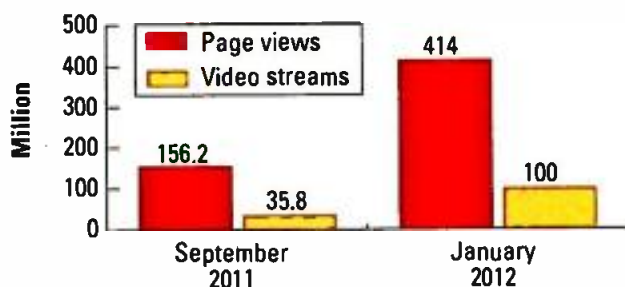
There are two parts to an HDMI connection: The source (such as a DVD/Blu-ray player, STB, game console or computer) and the sink (TV, monitor, projector). Repeaters were also developed to retransmit the HDMI signals through additional AV equipment that could also switch between multiple HDMI inputs, such as audio receivers for home theater.

When an HDMI connection is made, the source queries the sink to find out what type of display signal it requires. This is accomplished with extended display identification data (EDID), a set of display parameters stored in nonvolatile memory that includes pixel clock, refresh rate and timings for standard and custom resolutions.

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

ABC News-Yahoo! partnership bears fruit

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VIDEO SYSTEMS

A second handshake verifies whether copy protection is present. The HDCP layer requires an exchange of 56-bit keys between sources and sinks. Each HDCP-compliant device has a set of 40 different keys, which are exchanged when an HDMI connection is made. Compromised keys will disable the connection.

Nice try, but no cigar

This architecture works well for simple source-sink and source-repeater-sink connections, as the exchanges of EDID information and HDCP keys are straightforward. But it is not suited to professional applications that require distribution amplifiers and matrix switchers. As a result, designing a professional video display distribution system around the HDMI standard is generally inadvisable, particularly when SDI and HD-SDI interfaces can already do the job.

And yet, it is being done by numerous companies, ostensibly to support formats such as Blu-ray and HDTV set-top receivers, but also to take advantage of the high-density connector and eliminate discrete connections for video, audio and data.

For a distributed video environment in the post and broadcast world, the challenge is to connect two or more displays with different resolutions to a single HDMI source. Which EDID is to be supported, and which displays are HDCP-enabled? How are multiple sources connected to one or more displays? All of these are real problems faced by anyone designing a multi-point HDMI distribution system.

Managing EDID

The conventional approach to EDID exchanges is to insert a repeater in the matrix switch so each display communicates directly with the source. While this approach is acceptable for a peer-to-peer connection, it does not work for two or more connected displays, particularly if they have different native resolutions.

The smarter approach is to store EDID settings in memory for each

connected output of the matrix switch. These settings remain active in nonvolatile memory, emulating a virtual display to ensure a media player does not go into sleep mode when it is not the selected source.

The switch then selects the highest resolution common to all connected displays. For example, a 1 x 4 matrix switch might have two 1920 x 1080p displays and two 1280 x 720p displays connected. When all four displays are active, the source is prompted to output 720p, as that is the only resolution common to all four displays.

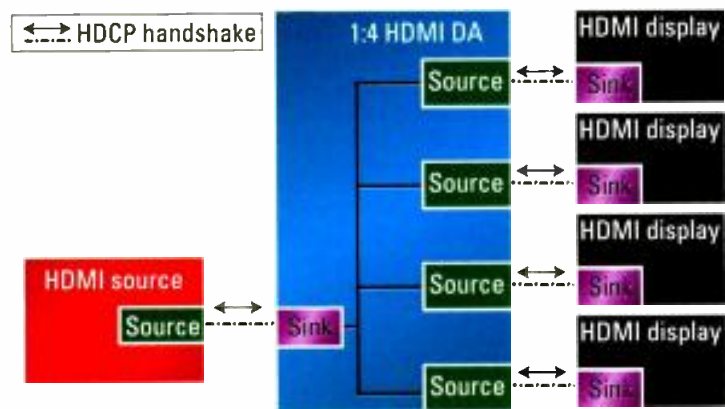


Figure 2. The proper way to handle HDCP handshaking is to make the switch a sink. Each output becomes a second source, looking for its own HDCP handshake with a connected display.

Should both 720p displays be disconnected from the matrix, the switch automatically reflects back 1920 x 1080 as the highest common display resolution. If one or both 720p displays are reconnected, the switch then reflects back 1280 x 720 to the source. This approach ensures that every connected display will show an image, although the resolution may change from time to time to accommodate all displays.

Managing HDCP

The next step is to verify and establish HDCP connections to all sinks. Using the conventional approach, a repeater within a distribution amplifier or matrix switch would pass HDCP keys back to the source. This means the source needs to decipher a different set of keys for each connected display, and if any key is corrupted, no signal will pass to any connected display, even if

the remaining displays are transmitting valid keys. (See Figure 1 on page 10.)

The solution is to make the switch a sink, thereby ensuring a constant and secure connection to the source or sources. And each switch output now becomes a second source, looking for its own HDCP handshake with a connected display. (See Figure 2.)

Once the secure connection is verified and keys exchanged, video from the actual source is passed through to the display. If a connected display is noncompliant, the matrix switch or DA will not pass video to that display only;

all other connected, compliant displays will continue to see video normally.

If new displays are connected to each port on the matrix or DA, the secure connection is re-established while EDID is exchanged. The copy protection is maintained at all times on all ports. Any issues with repeaters are eliminated, and multiple sources can be connected as easily as multiple displays.

Making the best of it

Like it or not, digital consumer display interfaces are here to stay. It's not easy, but the exchange of EDID and HDCP can be managed in a rational way to meet the switching and distribution requirements of a production or mastering facility, turning "plug-and-pray" into plug and play. **BE**

Peter Putman is president of ROAM Consulting LLC of Doylestown, PA.



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Spectrum sharing

The FCC rejects a novel proposal, preferring to chart its own course.

BY HARRY C. MARTIN

As part of its push to re-purpose television broadcast spectrum for wireless broadband use, the FCC has, since 2010, been promoting the idea of channel sharing. The idea is that two or more TV stations would share one 6MHz broadcast channel, each having its own program stream. To entice broadcasters to get on board with this plan, the FCC would afford each sharing station must-carry rights on cable and satellite.

The proposal

In November 2008, an assignment application was filed proposing a spectrum-sharing arrangement for some of the TV stations licensed to ION Media Networks. A new company, Urban Television, would acquire "share-time" licenses permitting it to broadcast over portions of ION station channels. ION would continue to be the licensee of, and would continue to operate, its existing

stations on the same channels. Urban is owned 49 percent by ION and 51 percent by entities owned by BET founder Robert L. Johnson.

The plan involved dividing a single station's 6MHz channel into multiple, separately licensed digital streams capable of accommodating separately

An outright rejection [of the proposal] with little explanation sends the wrong message.

owned TV stations. As proposed by Urban, each stream would be designated a "television station" and so would be entitled to the same mandatory cable and satellite carriage afforded to every station. To make the plan more attractive to the FCC, Urban offered opportunities for minority entrepreneurs to participate in station ownership and programming.

FCC reaction

The FCC invited comments on the Urban proposal in 2008, but after three years of inaction, the commission summarily dismissed Urban's implementing applications this January.

In a letter not publicly released, the FCC ruled that the applications proposed "a division of time, not a division of spectrum." But, this is a distinction without a difference in describing division of a digital television channel; today's digital television signal is a commingled stream in which the separate channels are created by interleaving data bits rather than partitioning a 6MHz channel into smaller independent frequency blocks. The

FCC also noted, "Channel-sharing arrangements quite different from that proposed here have become the subject of an outstanding Notice of Proposed Rule Making," referring to the agency's own 2010 channel-sharing proposal. The commission provided no further explanation of its rejection, and it did not elaborate on the differences between ION's proposals and those being studied in the rulemaking.

Comment

Although it is not surprising the FCC would reject a novel industry proposal while it is developing its own approach to the same subject in a rulemaking, it is difficult to see what harm would have come from letting Urban's experiment go forward. The commission, in implementing plans to re-dedicate TV spectrum for broadband use, wants to entice broadcasters to operate jointly on a single TV channel. Why not fold the Urban-ION plan, however novel, into the rulemaking, or at least authorize its proposal on an experimental basis? An outright rejection with little explanation sends the wrong message.

The commission has spent considerable energy trying to allay broadcasters' concerns that channel sharing presents an unattractive way forward. But by rejecting an arguably viable plan to do just what the FCC has been encouraging the industry to do, the agency has left television broadcasters with the impression that spectrum sharing will proceed along government lines or not at all. **BE**

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

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

Dateline

- On or before April 1, 2012, non-commercial TV and Class A stations in Texas must file their biennial ownership reports.
- On April 1, 2012, television stations in Maryland; Virginia; West Virginia; and Washington, D.C. must begin their renewal pre-filing announcements. Renewal applications for stations in these states are due June 1, 2012.
- By April 1, 2012, TV and Class A TV stations in the following states must place their 2012 EEO reports in their public files and post them on their websites: Delaware, Indiana, Kentucky, Pennsylvania, Tennessee and Texas.



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TV on the go

A choice of mobile-video business models helps broadcasters stay competitive.

BY ALDO CUGNINI

Mobile DTV standards give content providers the ability to broadcast multiple video programs and data to mobile and vehicular devices. Although basic broadcast content is expected to be free to the user, broadcasters now have the option of combining in-the-clear content with on-demand or subscription-based pay content. But mobile DTV (MDTV) is more than just “small TV” — it opens up a world of interactive and social applications.

Integrated vs. modular

Integrated and modular systems offer options for device features and time to market. At the simplest level, an MDTV needs a compatible chipset for the tuner and video decoding. VSB modulation is used with ATSC, and COFDM is used with DVB-H; both systems use H.264/AVC for video compression. Although some chipsets provide support for a particular

standard, enough commonality exists between standards that chipsets are available that support multiple standards in a cost-effective manner. These chipsets can be built into dedicated “one-way” MDTVs, which usually means more than a year of

Mobile DTV (MDTV) is more than just “small TV” — it opens up a world of interactive and social applications.

development time between product definition and market availability. The same is true for MDTV integration into a cellular phone, with an added business complexity: These devices are almost always defined and tightly controlled by cellular carriers,

some of whom may look at MDTV as a competitor with their own content service business. So, although some carriers may adapt their services to include MDTV, it is not clear that all will. Nonetheless, there are also strong arguments that even 4G networks cannot fully support live broadcast to millions of simultaneous users, so MDTV could be a better solution.

One way to speed the availability of MDTV devices is to use a modular approach, in which an adapter provides a signal to an existing video-capable device. Different wired and wireless interfaces will allow MDTV services to develop as best suits the marketplace, with no one system being the end-game.

For example, several manufacturers, mostly in the Far East, have already introduced USB dongles providing MDTV support for PCs. The devices are essentially tuners only, delivering an MPEG transport stream to a host laptop or netbook PC. Software supplied with the dongle is used to view an electronic program guide (EPG), tune the receiver and decode the compressed AV stream on the fly. These same USB dongles potentially could be used with some tablets, given appropriate interfaces and driver support. Dongles dedicated for use with a certain highly popular tablet are now available.

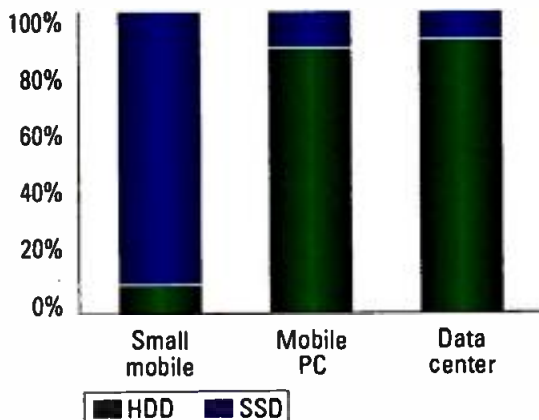
Another solution receives MDTV signals and converts them into a Wi-Fi signal for Wi-Fi-enabled viewing devices such as laptops, PCs, tablets and smartphones. One chip manufacturer also has announced the introduction of a multi-Wi-Fi system that simultaneously serves large numbers of users, such as on public transportation trains and buses, and in private vehicles such as taxis. This

FRAME GRAB

A look at tomorrow's technology

Storage predictions

A look in the crystal ball for 2012 shows solid-state storage gaining ground on the hard disk drive in a number of applications.



Source: Deloitte Technology, Media & Telecommunications Predictions Report 2012
Technology prediction: “Hard times for the hard disk: solid state storage surges.”

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would allow users to watch live TV, including local programming, without having to install any hardware or software on their personal devices.

Interactivity

Interactivity is the key to MDTV success. When presented with a new technology, today's consumer is not content with taking a step backward in functionality. Because consumers are now accustomed to deep interactivity with any smart device, they would find a mobile TV without similar functionality to be a rather limited experience. Mobile DTV must therefore bring a new level of capability to the broadcast medium and to the devices supporting it. The good news is that MDTV can provide support for sophisticated interactive user products.

Interactivity can be envisioned at both the local and network level. Locally, devices can offer interactive sessions by caching content that was downloaded in non-real time (NRT). In this manner, users can access more content than is available live. If downloaded by means of the OTA path, this means the device must be listening and storing whether it is idle or active. Similarly, enhanced information can be stored in the device, so that users can browse through additional content that is referenced by (and associated with) the live content, e.g., by means of live links. The key is that the enhanced content can be highly correlated with the mobile-channel video content, as well as individualized, offering a high added value to the broadcast experience.

A higher degree of interactivity can be accomplished at the network level, by combining MDTV with a return channel comprised of Wi-Fi services and/or 3G/4G cellular networks. In this way, a hybrid broadcasting network can be established that provides both an efficient return channel and maximum content bandwidth, allowing individually personalized content to reach every device. European broadcasters have already been

experimenting with versions of this type of network. Because of the multiple data paths, broadcasters will be able to define different and varying levels of service by a combination of free and paid content distribution and consumption.

With a hybrid network, the devices need not always be connected to the return channel. A broadcaster uses its MDTV OTA path to broadcast content on a one-to-many basis. A combination of collective and individualized side-channel content can be

Because consumers are now accustomed to deep interactivity with any smart device, they would find a mobile TV without similar functionality to be a rather limited experience.

pushed to the user devices, on an opportunistic basis, when the devices are "home," i.e., when connected to the user's wireless access point. Products and services also can be developed using a commodity-leased private cellular network, potentially unbundling devices from existing mobile carriers. Linking the MDTV receiver to a user's existing smartphone could also provide a return channel. Such a configuration would find use in a car video system, for example, offering interactivity and enhanced content to backseat passengers.

The importance of personalization

The importance of user personalization should not be underestimated. When connected to the network, user behavior and preferences can

be converted into a highly valuable asset for advertisers. An iterative, closed-loop channel communication process can allow content to be assembled and delivered to the user device following a deterministic connection, when the connection is provided. The user can pull content from the broadcast channel. Content value is highly dependent on the user's socialization capabilities.

The proliferation of devices that provide social networking capabilities provide an important means for interactive MDTV operation. Users want to connect with their friends and share the entertainment experience with others. This suggests a means for user intercommunication (e.g., texting, chats, blogs) will be a valuable feature for MDTV. Of course, the availability of an action channel (Wi-Fi, 3G) will enhance the user's socialization capabilities. This can be designed into a valuable service.

Spectrum issues affect the industry too. With the growing importance of alternate uses of spectrum, broadcasters can maximize their reach to viewers by using MDTV to provide the kind of personalized, localized experience consumers are demanding in portable electronics. Some observers have even proposed using MDTV to target local advertising events, essentially making rowcasting a part of broadcast product offerings. In combination with venue-specific wireless connectivity, and even potentially using white-space devices to augment the core content, broadcast can take on new business models and stay competitive.

Aldo Cugnini is a consultant in the television industry and a partner in a mobile services company.



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Network addressing

Here are some basics to layering, IP and Ethernet, and how it all works.

BY BRAD GILMER

Every engineer working with media these days should understand the basics of network addressing, and most of them do. But, network addressing is one of those simple things that quickly grows much more complicated once you really start thinking about it. For example, here are some questions: How do Ethernet addressing and IP addressing relate? Why are the network addresses 192.168.1.nnn and 10.0.0.nnn very common? Why is 255.255.255.0 always entered for a network mask? Is there ever a reason to enter another number?

Let's begin with the difference between Ethernet addressing and IP addressing.

Many years ago, when programmers wanted to write a program that made use of a connection between two computers, they would not only write the application they were concerned with, but also they had to write low-level code to access the networking hardware. I once worked on a project to develop one of the first network-based automation systems where network drivers were an integral part of the application. If the network card changed, the automation system program had to be rewritten.

This approach worked, but it created a monolithic program that incorporated all of the nuances of a particular networking card into the application itself. Clearly, this was not an optimal situation and left something to be desired. Instead, application programmers needed something that would isolate them from the rapid changes that were occurring in networking technology. Eventually, the solution came in the form of a layered approach to networking.

Network layering

Figure 1 shows a simplified version of the ISO 7 layer network model. Layer 1 describes the network hardware — the characteristics of the data transmitters and receivers, for example, whether the network is optical, wireless or wired. Layer 2 describes how to organize bits to be sent over a particular network — Ethernet, ATM or Token Ring, for example. Layer 3

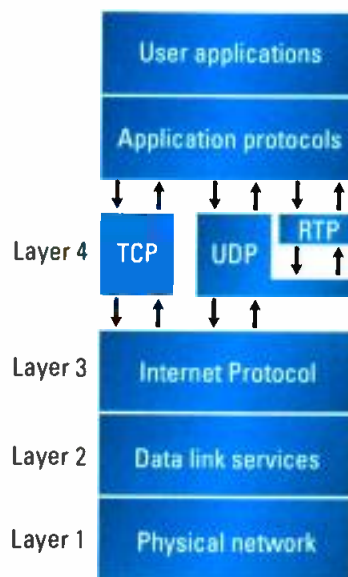


Figure 1. This simplified Network Layer model illustrates the separation of networking functions from the applications they serve.

deals with organizing groups of computers into discreet networks and how computers on those networks are addressed. Protocols operating at Layer 4 format data from an application into datagrams and can provide the ability to recover data under error conditions.

The layered approach allowed engineers to change hardware at Layer 1, and replace the software drivers at Layer 2 without having to completely rewrite the application using network

services. As we will see later in this article, the division between Layer 2 and Layer 3 allow designers to organize computers into logical groups.

Ethernet vs. IP

The Ethernet specification defines behavior at both Layer 1 and Layer 2. Therefore, it is both a network protocol and a hardware specification. The hardware specification lays out the electrical signals and voltages on the wire (or the RF transmission scheme in the case of wireless), physical connections, timing signals and so on. It also describes the way Ethernet packets are built and what is contained in Ethernet headers.

Two important pieces of information in the Ethernet header are the source and destination Ethernet addresses. Ethernet addresses are permanently associated with a physical device; they are similar to a Vehicle Identification Number which is used to uniquely identify a particular automobile. Ethernet addresses are sometimes referred to as Media Access Control (MAC).

In Ethernet applications, each card is given its own unique 48-bit MAC address. This address is permanently assigned to the card when it is manufactured. (Security note: In some cases, this address can be changed or spoofed.) The MAC address takes the form nn:nn:nn:nn:nn:nn, where nn can be either a number or letter from "a" to "f." An example of a valid MAC address is 00:09:6b:8d:79:96.

The IEEE assigns blocks of MAC addresses to a manufacturer. Within that block, it is up to the manufacturer to ensure that each address it assigns is unique. So, the MAC address above can also be written IBM_8d:79:96 because IBM has been

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assigned the block of MAC addresses beginning with 00:09:6b. Layer 2 Ethernet addresses provide positive identification of a particular computer, but they (usually) cannot be changed and provide no way to organize computers into groups or networks. In practical implementations,

sometimes called subnet, by assigning the computers' addresses within the subnet range — for example, 127.0.23.0 to 127.0.23.254 with a subnet of 255.255.255.0. Layer 3 allows the network designer to clearly identify a group of computers that belongs together. It also allows

but how do you get a public address? The short answer is that you get this address from your ISP. But, where does the ISP get its addresses?

IP addresses are assigned by the Internet Corporation for Assigned Names and Numbers (ICANN). Many years ago, an individual could have applied for a public IP address. These days, it is impossible for any single individual to get a public IP address. The only practical way is through your ISP.

| Starting address | Ending address | CIDR notation |
|------------------|-----------------|-------------------|
| 10.0.0.0 | 10.255.255.255 | 10/8 prefix |
| 172.16.0.0 | 172.31.255.255 | 172.16/12 prefix |
| 192.168.0.0 | 192.168.255.255 | 192.168/16 prefix |

Table 1: Private IP address spaces such as these are defined by IETF RFC 1918.

the MAC addresses of computers in an engineering department will be entirely random.

For a router on the network to know whether a particular packet was destined for a local computer or for a computer on the Internet, that router would have to store the MAC address of every computer both locally and on the Internet — an almost impos-

sible task. Therefore, while Ethernet addresses uniquely identify a specific computer, they can't be routed, meaning that, from a practical standpoint, you cannot use Ethernet addresses to contact computers over the Internet.

Getting an IP

If MAC addresses are assigned by the IEEE, where does an IP address come from? The answer depends on its intended use.

How Ethernet and IP relate

In 2012, it is obvious that IP traffic riding on Ethernet networks is the dominant networking technology. But, in the early days of network development, many transport options besides Ethernet existed, and it was not at all clear which one would win. In fact, ATM and Token Ring are still in use today. Like Ethernet, both of these Layer 2 protocols can carry IP traffic. The beauty of IP is that it allowed network designers to assign addresses and logically group computers together regardless of whether the underlying transport was Ethernet, ATM, Token Ring or any one of a number of Layer 2 and Layer 1 technologies that were vying for adoption in the 1970s and 1980s.

The separation between Layer 3 and Layer 2 allowed network engineers to change the underlying network transport without having to alter the logical grouping of computers on the network. **BE**

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

In 2012, it is obvious that IP traffic riding on Ethernet networks is the dominant networking technology. The beauty of IP is that it allowed network designers to assign addresses and logically group computers regardless of the underlying transport.

sible task. Therefore, while Ethernet addresses uniquely identify a specific computer, they can't be routed, meaning that, from a practical standpoint, you cannot use Ethernet addresses to contact computers over the Internet.

The solution to organizing computers into groups or networks is provided by Layer 3 of the ISO model. In this layer, machines are identified by a user-configurable network address (an IP address). IP addresses are written in "dot" notation, with four numbers between 0 and 255, separated by periods — for example, 127.0.23.41. An engineer can assign a group of computers to a logical network,

If you are building your own private network, you are free to assign your own IP addresses. RFC 1918 defines IP addresses for "private networks." As Table 1 shows, this easy-to-read document sets aside three "blocks" of IP addresses for use inside a facility. The IP addresses we use and the subnet we select will depend upon the number of PCs and network devices we plan to install.

It is important to note that private IP addresses are "unroutable," which means they can never be used on the public Internet.

We have answered the question of how you get private network addresses,

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Microphones

Future mics need to be more digital and more controllable.

BY JACK KONTNEY

In an audio world that seems to be all about digital streams, format conversion and file manipulation, two pieces of equipment remain firmly entrenched as analog devices — the input and the output. Why? Because no matter how much technology is applied within the signal path, the simple fact is that actual audio is a real-world phenomenon of sound waves traveling through the air and reaching our ears.

Reproducing that sound requires transducers — devices that transform sound into electrical information (input) and vice versa (output). On the input side, the capture and transduction of real-world sound sources has been accomplished by microphones for more than a century. The first microphone patent was granted to Thomas Edison on an application filed in March of 1877. So, to say that the microphone is a mature technology is an understatement.

Yet, new and better microphones are announced constantly, begging the question: What possible new variations on this age-old theme are truly needed? Are today's microphones truly better, or is this all puffery designed to boost sales while recycling and recombining a bunch of tired ideas in shiny new packages?

Application-driven design

As broadcast workflows change to take advantage of today's computer-driven advances, microphone manufacturers continuously adjust their offerings. The realities of networked audio, digital recording and surround sound have created needs and opportunities resulting in purpose-built designs that pull mature, proven transducer designs into the 21st century.



Microphone performance is critical, whether it is for an act at the Grammy awards, or recording the opening theme to "Hockey Night in Canada," which the Toronto Symphony Orchestra, shown here, did in 2010.

While household usage of full surround sound continues to lag, the production side of the industry has adopted it almost universally. Deploying traditional mics to capture stereo and surround information is problematic, so manufacturers have produced a wide range of microphones and mounting systems to make the job easier.

Surround mics modeled on the human skull use an array of individual mic capsules to provide discrete outputs for center, left, right and surround channels. Other systems use a more traditional form factor, using multiple mic capsules paired with remote electronics to deliver simultaneous mono, stereo, mid-side (MS) stereo and surround information. Even the classic Decca Tree stereo recording system has also been updated and adapted for the needs of surround sound capture.

The whole concept of "in the box" computer recording and mixing is similarly reflected in new microphone

designs. Professional-quality mics are now available with USB outputs, enabling them to be plugged directly into a laptop, desktop or tablet computer. Similarly, the use of traditional low-impedance XLR mics is now accommodated by USB interface boxes. This allows professional production standards to be met virtually anywhere, including office cubicles and home studios.

In the field

Microphones have evolved and adapted to the needs of video capture in the field. Camera-mounted versions of shotgun, stereo and surround microphones have become commonplace. More importantly, today's field production recording devices now enjoy high-quality pre-amps, and many studio-quality microphones now have the ruggedness required to deliver incredibly clean, detailed recordings under virtually any conditions.

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For the more common ENG application of voice recording, the ubiquitous smartphone looms as a possible game-changer. Traditional field packs of recorders, mixers, microphones and the batteries to power them are



Hearing what takes place on the court or field has become an integral part of sports broadcasts and the viewing experience at events like Wimbledon, shown here.

a bulky assemblage. But with a smartphone and a few well-chosen apps, the same job can now be done with a single handheld device. The only issue is the lack of quality microphones to interface with them.

Because smartphones and computers are designed for the consumer market, audio is something of an afterthought in such devices, with the on-board microphones being cheap condensers. Naturally, however, after-market upgrades are available. To date, high-quality professional recording via smartphone remains elusive. But, looking at overall trends, it's only a matter of time before a high-quality microphone and/or preamp emerges to make the concept of a single-device, field-production setup possible.

Digital microphones

With the concept of analog broadcasting already near extinction, every part of the signal chain has moved into the digital realm. Traditionally, microphones transduce the sound they capture into an electrical signal. Getting that signal into the digital realm has to happen, so it's no surprise that digital microphones are beginning to appear.

Digital microphones perform their analog-to-digital (A-D) conversion immediately after the mic capsule, with an output stream that (typically) conforms to either AES/EBU or AES 42 standards. The idea is to move the audio signal to the digital realm as soon as possible. Because each conversion operation (A-D or D-A) adds latency, the optimal situation is to keep the signal digital from the point of capture all the way through the audio chain to actual broadcast. Ideally, that audio would not be converted back to analog until being sent to a loudspeaker.

Today's digital mics offer exceptional quality, with 24-bit conversion, wide dynamic range and sampling rates up to 192kHz. With the audio information in the digital domain, the addition of on-board DSP opens up enormous control possibilities as well.

It is only a matter of time before a high-quality microphone and/or preamp emerges to make the single-device, field-production setup concept possible.

The bottom line on digital microphones is that the market is simply not yet ready to embrace them. Familiarity and tradition die hard, and the enormous installed base of analog inputs to sound systems will need to be replaced before this next generation of products can proliferate. That's why most digital wireless systems on the market today still rely on analog outputs.

During my days working at a major microphone manufacturer in

the 1990s, the market demanded a better headworn microphone for music, driven by artists like Madonna and Janet Jackson and enabled by the emergence of wireless. Based on user input, we created a specification for the "ultimate headworn microphone." It would fit any size/shape of head in total comfort, keep the mic element in a stable position, and would also be weightless and invisible. Oh, and it would have full-range frequency response while never messing up anyone's hair.

Have we gotten there? Obviously not. But comparing today's headworn microphones to those of, say, the mid-90s, is an eye-opening exercise. My point is this: For any given circumstance, there is an optimal microphone design. As long as applications keep changing, microphone manufacturers will keep striving to optimize that critical first link in the audio chain. So, don't dismiss these new microphones. While there is truth to the idea that a mic case full of classics like the SM57 or RE10 will get you through pretty much anything, the bottom line is that striving for excellence requires a broader view.

Modern materials and design have given us non-fragile ribbon microphones and headworn mics that weigh under an ounce. Upgraded industry standards and advances in electronics have brought us mics with miniscule noise floors. Wireless mics now rival cabled versions in sound quality. The move to surround sound has created huge advances in multichannel pickup systems.

So, while the microphone is a mature technology, the fact is that today's designs are light-years ahead of their predecessors. Microphone manufacturers as a whole are clearly dedicated to evolution, using the lens of changing industry needs to focus on innovations that will meet the ever demanding needs of tomorrow's pro audio world.

BE

Jack Kontney is a regular contributor and authors the "Audio Technology Update" e-newsletter.

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Frame-rate conversion

Effective conversion means higher-quality programming.

BY CHRISTOPHER WALKER

Frame-rate conversion is necessary almost always. It is needed in cinema when projecting 24fps material at 48fps or 72fps. In post-production, it comes into play when combining material shot at different frame rates or changing speeds for effect. It's used to reduce flicker for high frame-rate displays. And, it is useful when sending to different countries and display devices.

The convention is that motion imaging has a native frame rate — the number of images created over a particular period of time. When a ramp-up or ramp-down is done during creation, the native frame rate must be specified as it is no longer constant throughout the piece. Also, time-lapse or high-speed filming is done with a planned presentation frame rate different from the capture frame rate. But, how do we know what the “native” frame rate of a piece of video is supposed to be?

The simplest frame-rate conversion presents the original frames at a different rate than at which they were shot. Time-lapse footage shot at one frame per minute and played back at 30fps or 25fps for TV is an example. The most common example is when moving from film at 24fps to PAL at 25fps. One simply plays back at 25fps and shifts the audio pitch. The duration is reduced by 1/24 every second, but we cannot see this. “Gone with the Wind” is 238 minutes long. But, the same version in Europe is 228.5 minutes, leading many people to think 10 minutes were cut!

The television frame rate in the Americas is 30fps. Speeding up from film would be visible; therefore, 2:3 pulldown was invented. The process inserts additional frames so that the duration is unchanged. In most theatres, film is projected at 72fps via a

shutter showing the same frame three times before the next is moved into place. When the U.S. TV frame rate was standardized in 1941, the best that could be economically achieved was 30fps interlaced at 2:1. This pro-

vided a decent picture in a living room environment with minimal motion artifacts. By the 1930s, the UK had already standardized on 25/50, so moving between the frame rates was required. Today, it's possible to



This six-frame sequence illustrates how various types of motion vector-based processing can affect image quality. The original frame is shown in (a). In frames (b-f), different types of artifacts develop as PSNR varies and the motion prediction methods are changed. Note the breakup of the white boundary line in (b) and especially (c). Compare the ghosting of static text in (d) with much clearer text in images (e) and (f). Images courtesy Ai-Mei Huang and Truong Nguyen, IEEE Transactions on Image Processing, Vol 18, No. 4, April, 2009.

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synthesize frames based on adjacent frames' information. At first, this was done by frame blending, which worked for broadcast TV but caused visible artifacts in still frame. Now, modern digital abilities allow better missing frame reconstruction accuracy.

The most complicated frame rate conversion I've worked with was a recent 3-D shoot of a classical pianist. Originally shot for European TV at 1920 x 50i, our job was to meet 3-D Blu-ray needs. Specification limitations require a 23.976 source due to the increased data rate required for simultaneous playback of two streams of 1920 x 1080 video. Pitch shifting the audio was not an option. Dropping video frames resulted in visible judder, unacceptable for the prestigious project. New frames had to be synthesized, and in sync for both the left and right eyes.

If duplication or deletion of frames is not an option, new frames need to be synthesized. How these frames (or fields) are generated is a trade-off

between time, money and accuracy. No matter the method (blending or interpolation), the number of frames needed is a primary factor. The smaller the frame-rate change is, the more new frames will be required per second. For example, going from 24fps to 25fps allows the reuse of only 1fps, whereas going from 24fps to 36fps allows for the reuse of three frames per second. This is only the case if frames have to stay in the same relationship. If the difference between adjacent frames is minimal, then more frames may be reused. This is a trade-off between spatial accuracy (reusing the original frame) and temporal accuracy (objects in the new frame are where they are supposed to be in time).

The simplest method for frame syntheses is blending. This can actually be done in the analog domain by using a delay with multiple taps equalling the number of frames you wish to blend. Digital frame memories have made this the basis for the low-cost standard convert-

ers available today. Add more memory and some processing to compare frames so original frames can be as often as possible. Results can be quite good. When the blending algorithm uses different percentages from adjacent frames, this is called adaptive motion interpolation.

The next step is to cut and paste from adjacent frames only changed portions. This is done by dividing each picture into a number of blocks and estimating change location in the new frame.

Algorithms that do this are a research topic at major universities worldwide. Commercial and non-commercial implementations of these algorithms are available. ASIC implementations are built into high frame-rate TVs under names like Motionflow, Motion Picture Pro, Perfect Pixel or HyperReal Engine. If render time isn't a criteria, then excellent results can be achieved using algorithm implementation software.

The best method of frame-rate conversion uses phase correlation to estimate motion, thus accurately defining missing pixels. By translating the picture into the frequency domain using FFT, it is possible to eliminate irrelevant information from the motion vector calculation. Manufacturers of real-time motion vector compensated frame-rate converters for production applications can be counted on one hand, and each of these excels when converting different material.

Underlying algorithms for frame-rate conversion are the same as those used for video compression. It is hoped that advancements in video compression, and the very real possibility of applying these advancements to frame syntheses, will result in more choices. More choices and falling prices will make for better programs as creative options provided by frame syntheses in post become available to a larger community of users. **BE**

Choosing workflow codecs

To avoid undue picture-quality deterioration, there are some rules to follow when designing a production workflow. The first rule is not to upconvert the resolution. Shoot, edit and archive in the highest-resolution format that will be used for distribution. The second rule is not to re-encode to a higher data rate; it is a waste of bandwidth and storage. The picture quality is limited by the lowest data-rate encode, and it is not going to improve.

Also, don't use interlace if the output is progressive, and don't upsample the color sampling (4:2:0 to 4:2:2). From these rules comes a pattern: The data rate decreases through the workflow. The only place that rule is broken is in the camcorder, where the signal is most likely more compressed than in the edit.

A broadcaster will have different demands from various departments. News will acquire, edit and archive in different formats than will entertainment. Things were simpler in the SD world. You could shoot, edit and deliver in one format, Digital Betacam or DVCPRD.

In the multiresolution world of HD-to-mobile, it is just not possible to use one format throughout the process chain. Rewrapping and transcoding have become an essential part of the video workflow. How and where this takes place in the broadcast chain must be carefully considered in order to avoid picture quality loss, yet still reduce the cost of storage and video networks. Overall, there is no single, best answer to picking a format, and the optimum choice is constantly changing as technology advances.

For more information, check out the "Video format conversion" article by David Austerberry on our website at <http://broadcastengineering.com/production/video-format-conversion/index.html>.

Christopher Walker is consulting engineer for SONY DADC Austria.



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Exhibit Hall Map



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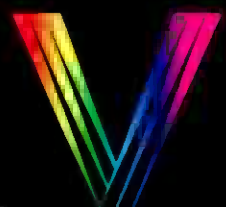
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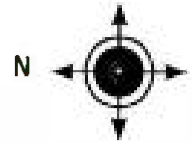
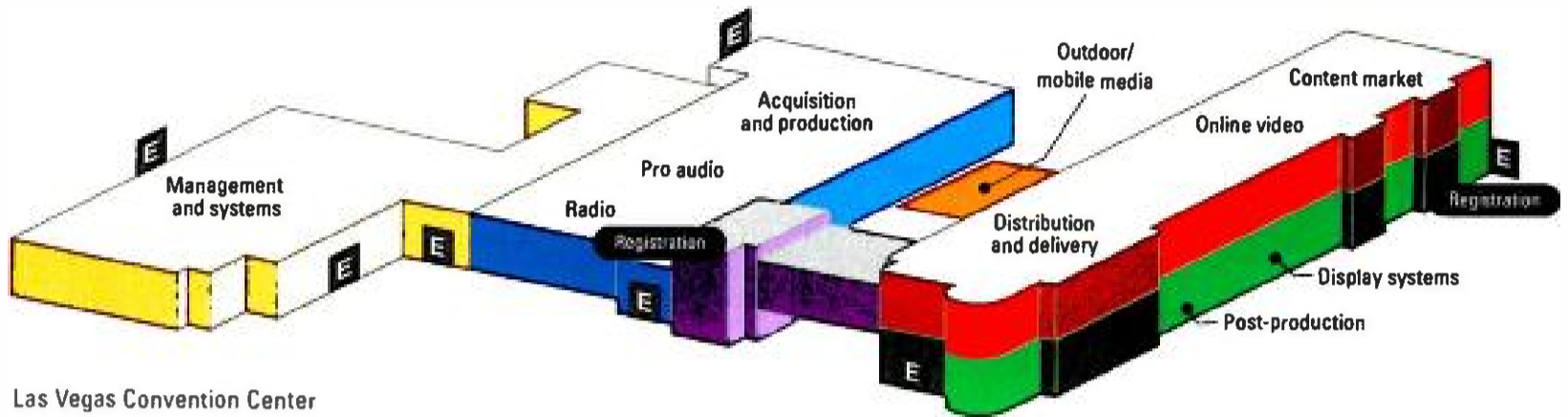


EXHIBIT HALL HOURS

Monday, April 16-Wednesday, April 18 9 a.m.-6 p.m.
 Thursday, April 19 9 a.m.-2 p.m.



Las Vegas Convention Center

Map information current as of Feb. 27, 2012

MAP INFORMATION

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

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

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

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

PRODUCT CATEGORIES

- Management & Systems** — Includes DAM, storage, 3G B/S, cloud computing, routers, master control, newsroom automation, servers, multicasting and workflow solutions.
- Acquisition & Production** — Includes cameras, lenses, motion capture, 4K and virtual production.
- Pro Audio** — Includes 5.1, editing, mastering, mixers, effects, encoding, recording and compression technologies.
- Radio** — Includes analog, digital and streaming technologies, antennas, transmitters, towers and microwave/RF accessories.
- Outdoor/Mobile Media** — ENG, SNG, DSNG vehicles, mobile production studios, outdoor signage, power generation and satellite uplink.
- Distribution & Delivery** — Includes HDTV, 4G, IPTV, cable equipment, test and measurement, fiber to the home, streaming, and Wi-Fi/Wi-MAX.
- Content Market** — Includes aggregators, syndicators, studios, publishers, advertising, news/weather/traffic, sports, stock footage and UGC.
- Online video** — Interactive television, OTT, content delivery networks, encoding, streaming, advertising platforms and VOD.
- Display Systems** — 4K, digital signage, TV sets, monitors, projectors, projection screens, video display and Ultra HD.
- Post-Production** — Includes animation and VFX, digital intermediate, editing software/hardware, 3-D technologies, motion graphics, subtitling and captioning, and encoding.

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See Videssence at booth #C6537 on page 6

NORTH HALL

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See Ensemble Designs at booth #N2524 on page 5

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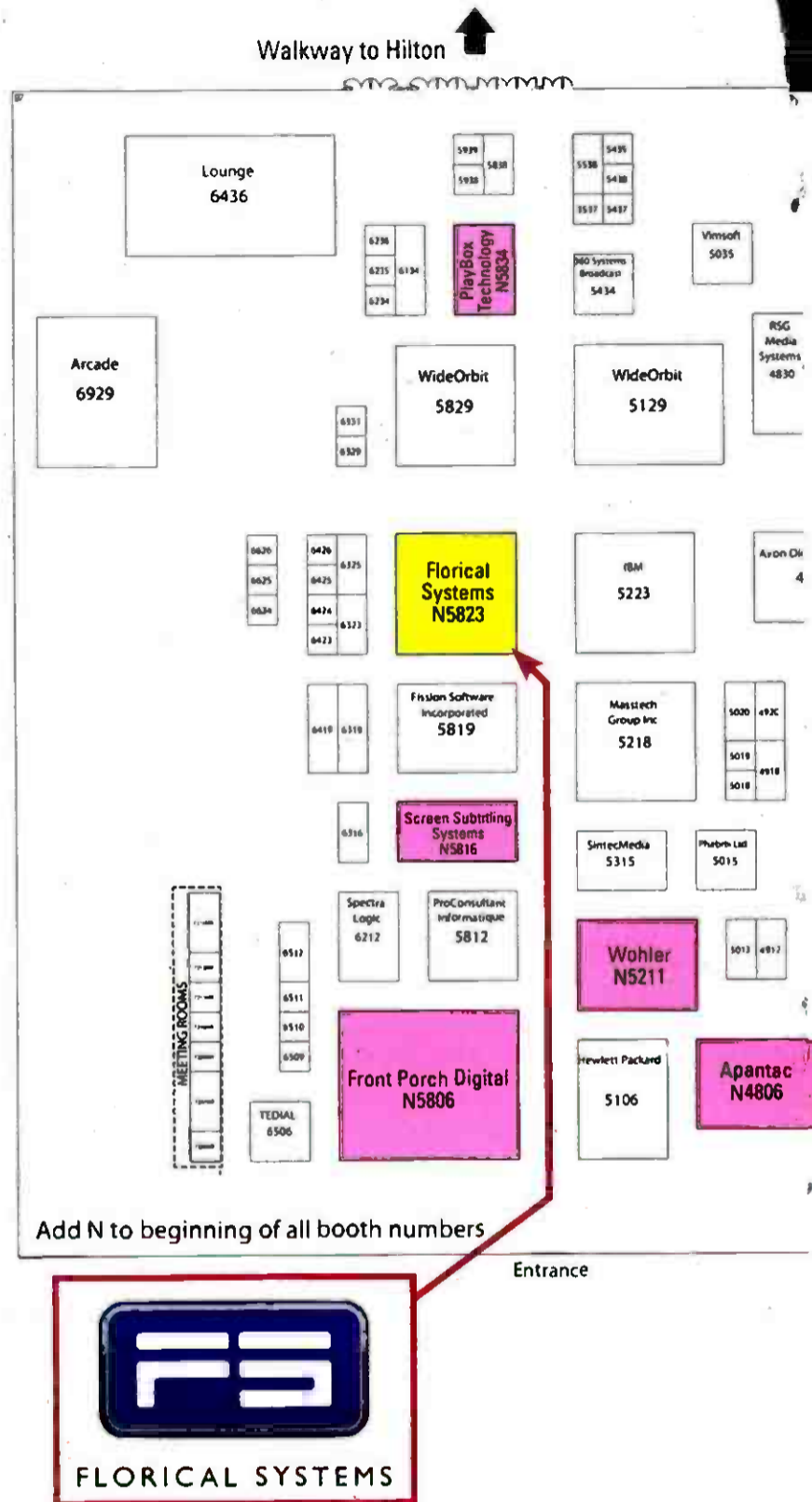
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See Evertz at booth #N1502 on page 5





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CENTRAL HALL with lobby and main entrance meeting rooms

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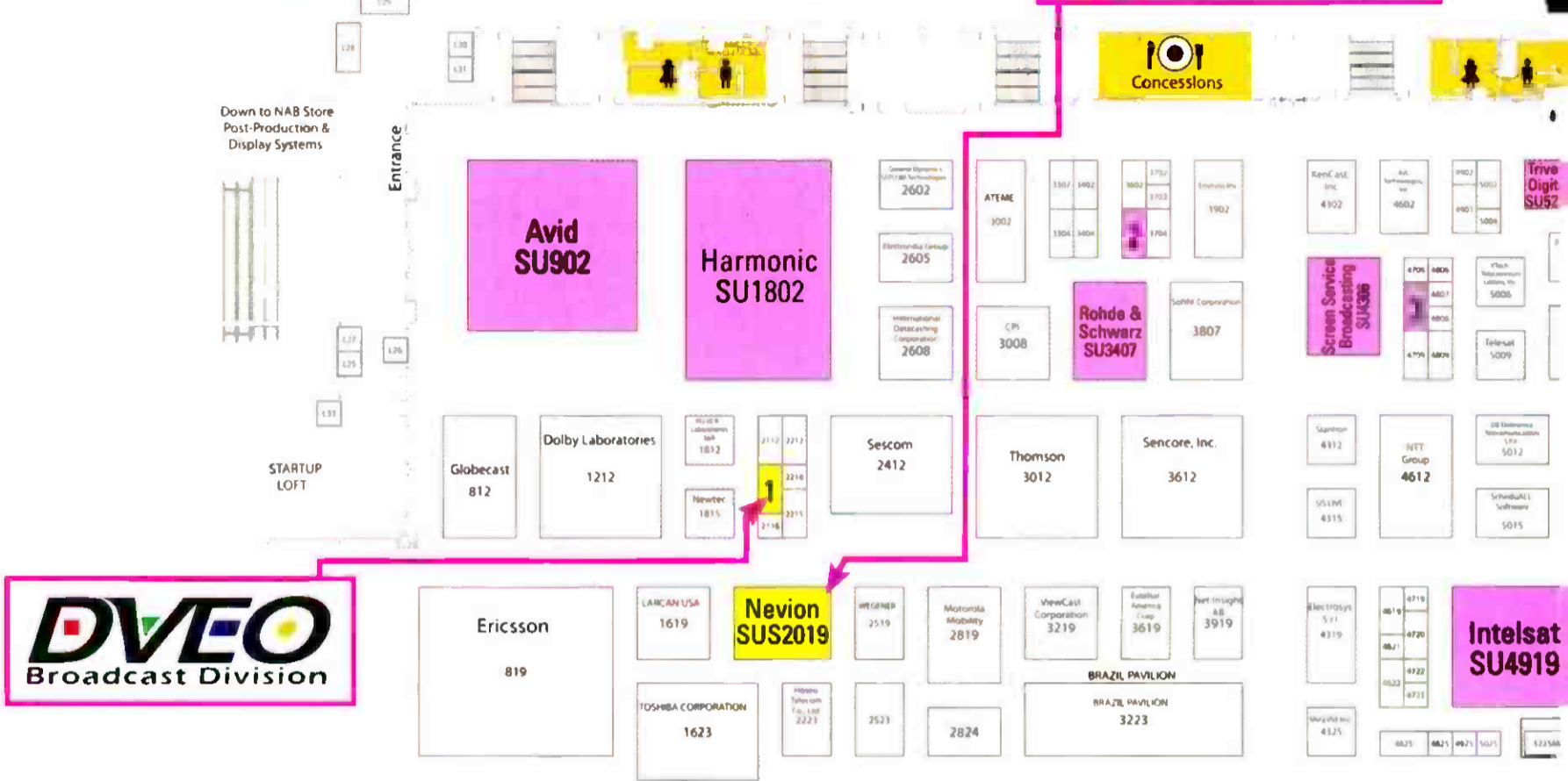
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| 6 | DK-Technologies | C9942 |

SOUTH HALL, upper level with bridge corridor meeting rooms

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★ ▲ Meeting rooms & Bridge Corridor to Central Hall



Add SU to beginning of all booth numbers

See Nevision at booth #SU2019 on this page

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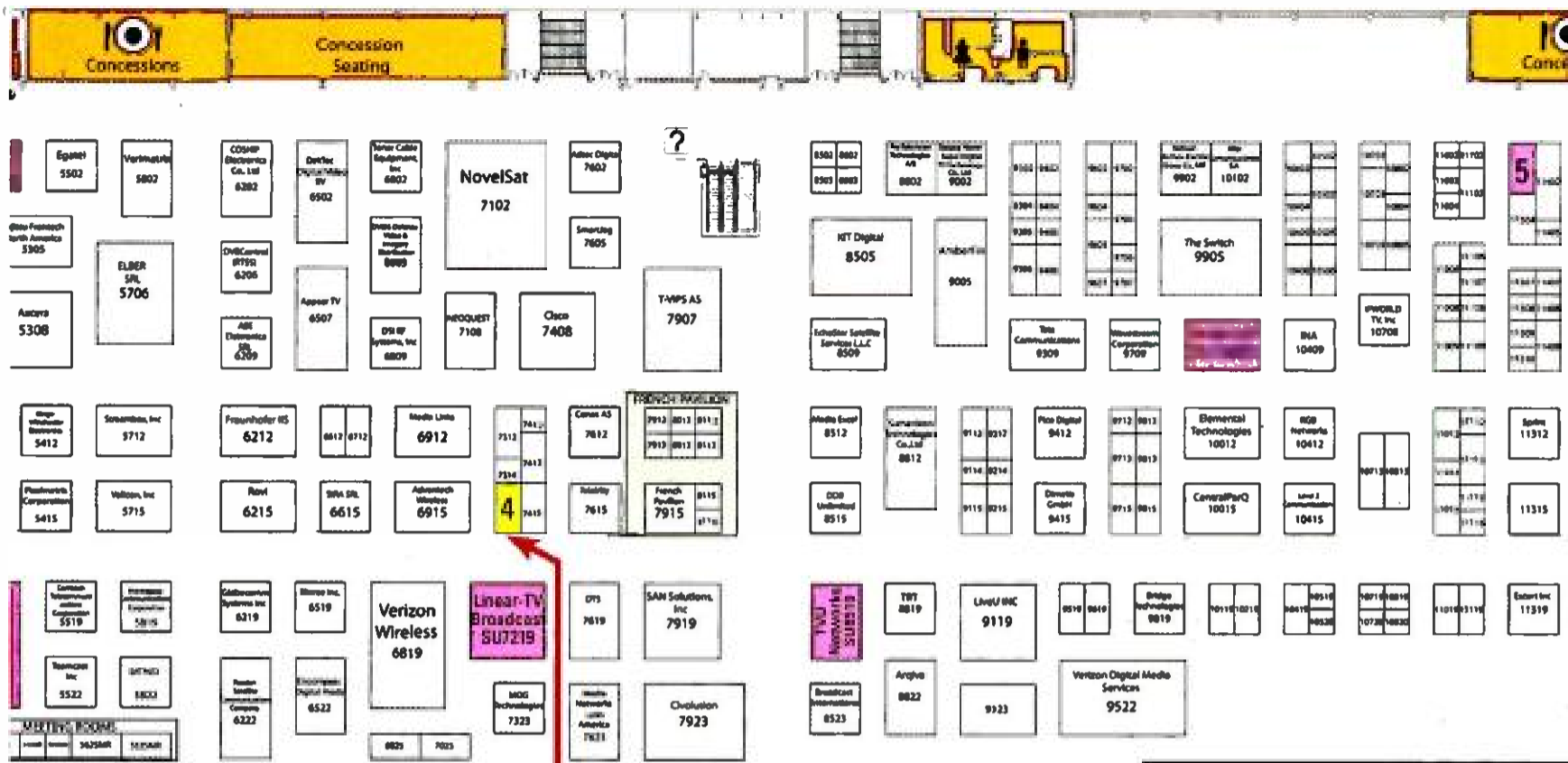
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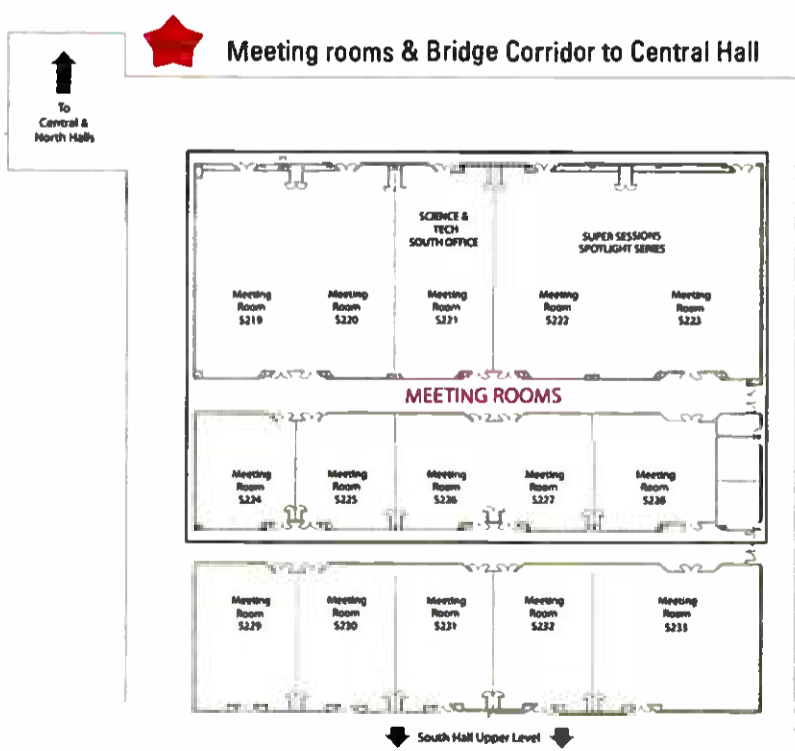


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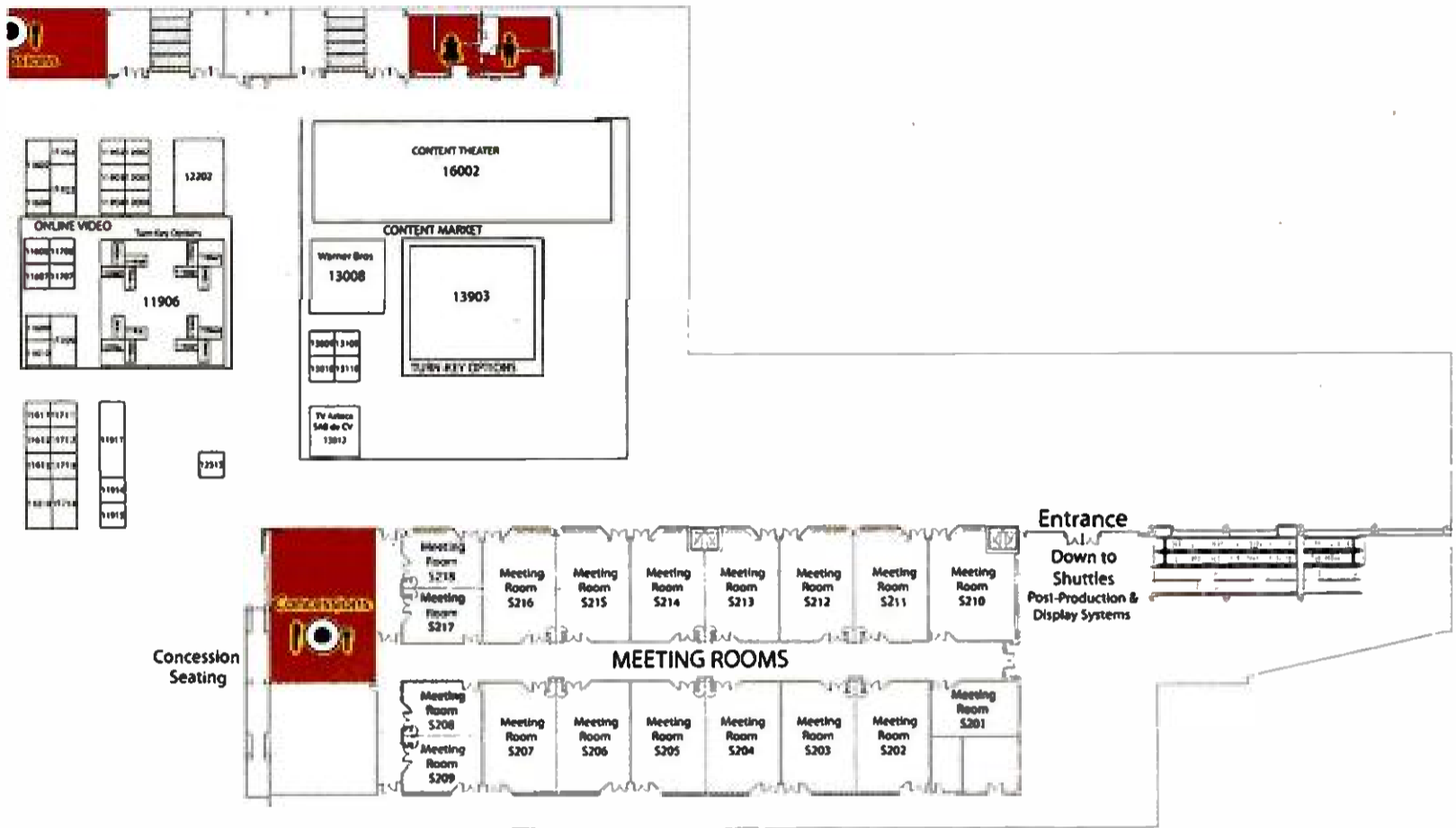
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South Hall (upper) continues on page 10

SOUTH HALL, upper level

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See Broadcast Engineering at booth #N724 on page 5



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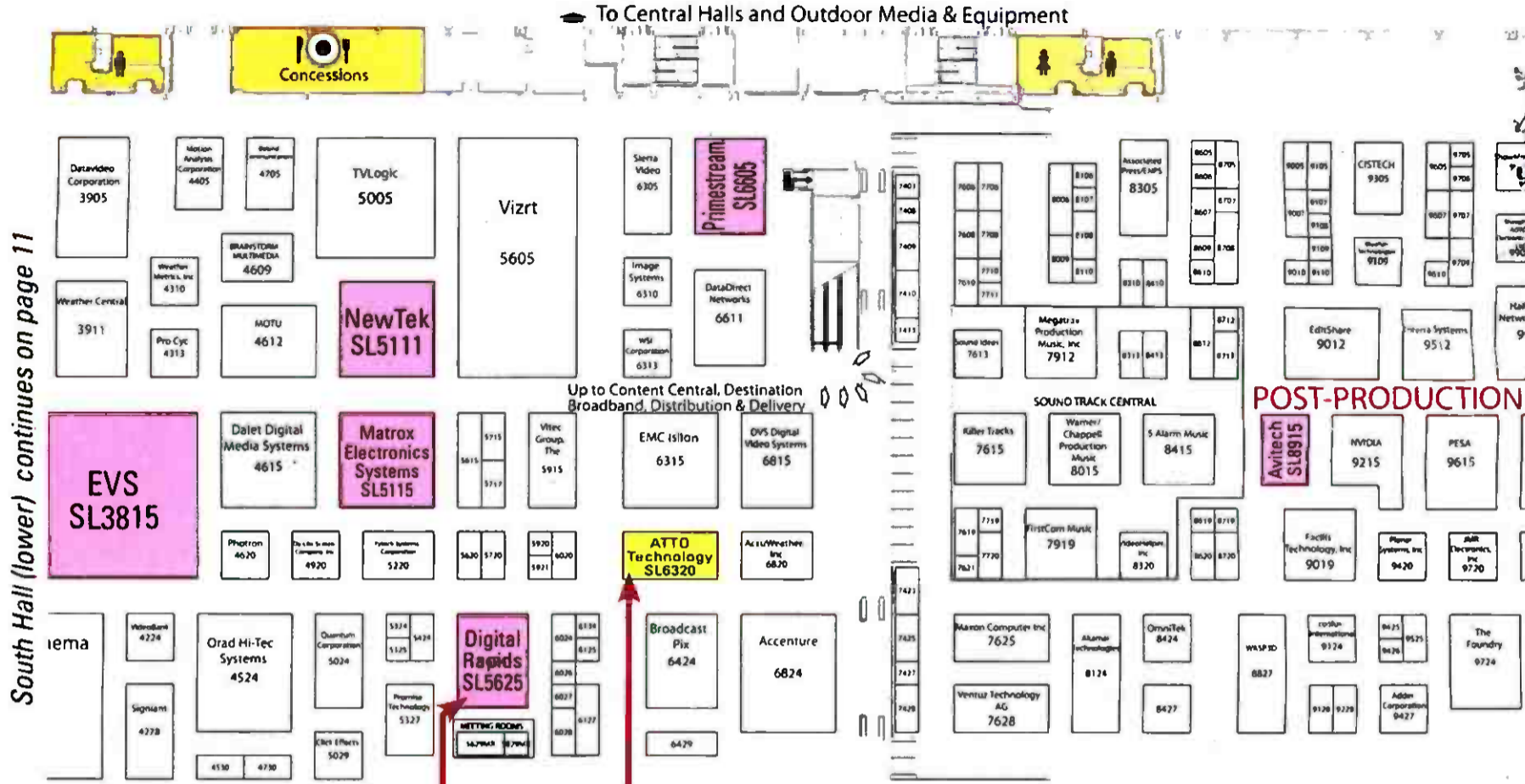
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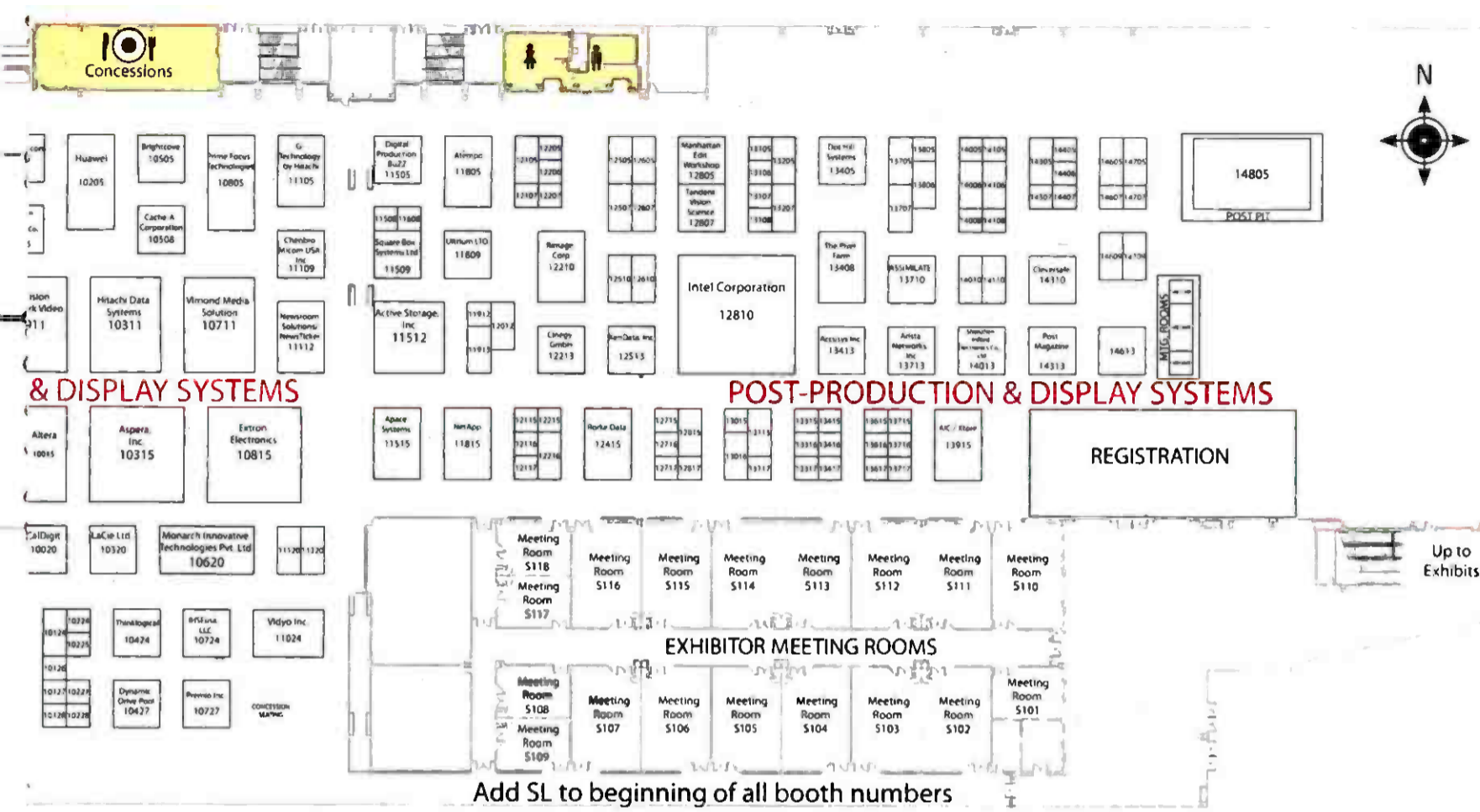


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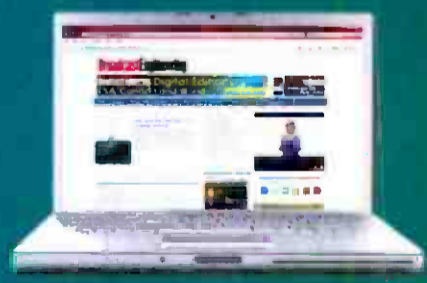


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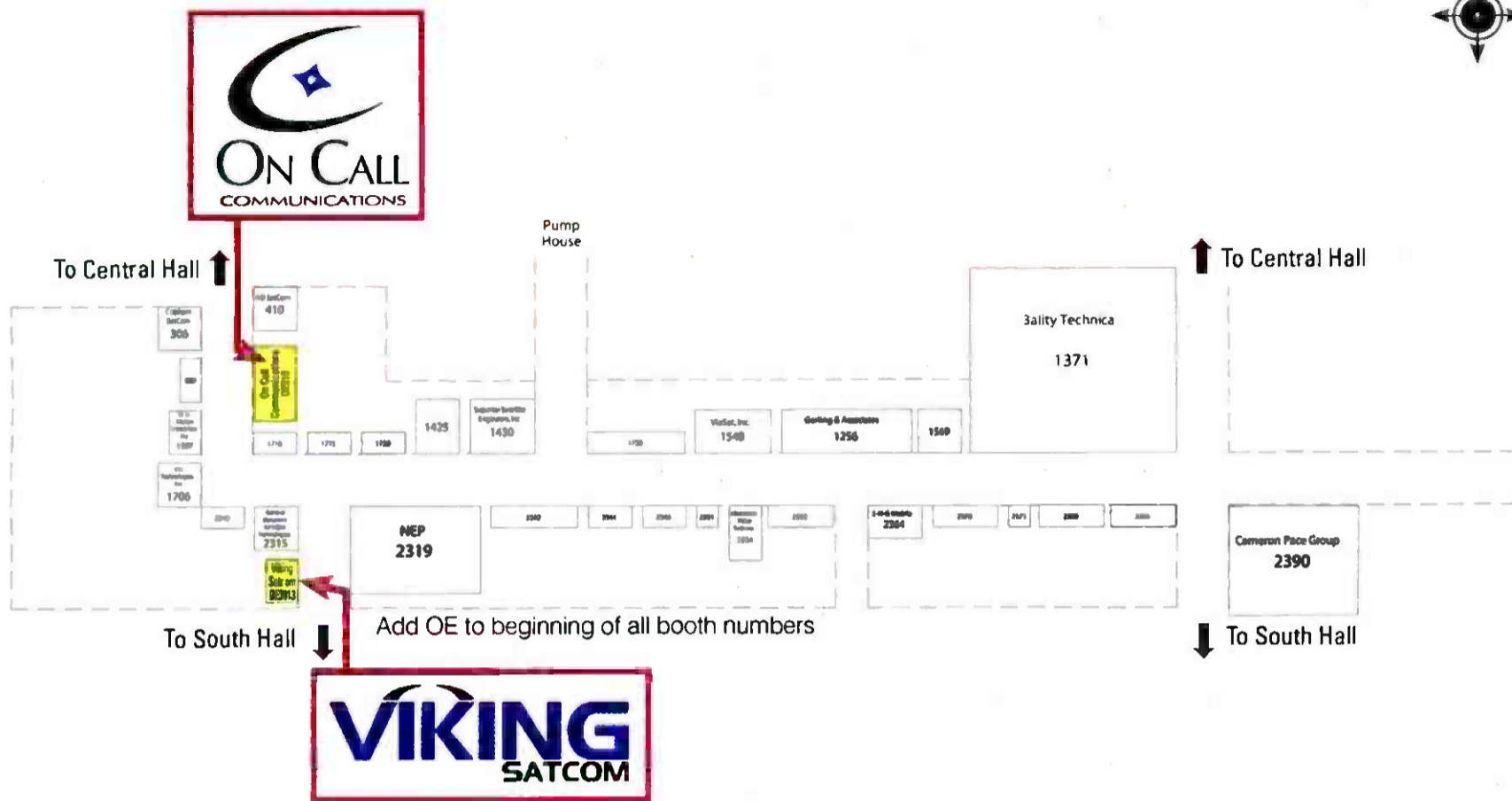
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Back cover: See Grass Valley at booth #SL106 on page 11

See Ensemble Designs at booth #N2524 on page 5



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Now you can look at your source before you do a take. The exclusive live thumbnail display in the 9430 Avenue Router panel shows you the source before you take it to air. And it does so without the need for external monitors or a monitor bus output on the router. Video monitoring plus indicators for synchronicity and timing, audio, closed captions and AFD give you confidence that your source is ready to use.

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grass valley

The BroadcastEngineering 11th annual Excellence Awards



New studio or RF technology – station

WINNER: PBS39 WLVT 36

Submitted by: The Systems Group



Runner-up: Christian Broadcasting Network (CBN)
Submitted by: Calrec Audio

New studio technology – network

WINNER: WABC Studio 77 36

Submitted by: The Systems Group



Runner-up: TV-3
Submitted by: Ross Video

New studio technology – HD

WINNER: KOMO-TV 38

Submitted by: Wheatstone

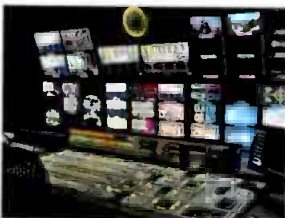


Runner-up: The Gayle King Studio
Submitted by: NEP Broadcasting

New studio technology – non-broadcast

WINNER: Microsoft Production Studios 38

Submitted by: Diversified Systems

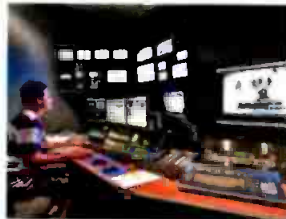


Runner-up: Austin City Limits
Submitted by: Sony

Station automation

WINNER: NHL Network 40

Submitted by: Comcast



Runner-up: WJLA-DT & NewsChannel 8
Submitted by: The Systems Group

Network automation

WINNER: The Switch 40

Submitted by: Beers Enterprise



Runner-up: Disney/ABC Television Group
Submitted by: The Systems Group

Newsroom technology

WINNER: KWQC 42

Submitted by: Grass Valley



Runner-up: Arqiva DSNG Fleet
Submitted by: Ericsson

Post & network production facilities

WINNER: CNN Washington Bureau 42

Submitted by: Lawson & Associates, Architects



Runner-up: Crawford Media Services
Submitted by: Harmonic

Note from the editor

This year there were 27 entries in Broadcast Engineering's Excellence Awards contest.

The winning entries reflect thousands of votes we received from our readers on the website.

Congratulations to all the entrants in this year's contest. You represent the highest quality in television, production and network technology in the industry. To see firsthand the equipment and solutions used by these leading facilities, visit the NAB booths of the vendors described in the stories.

For directions to each vendor's booth at NAB, check out our extensive Exhibit Hall map insert.

Brad Dick
Brad Dick,
Editorial Director

PBS39 WLVT

Winner of new studio or RF technology – station

Submitted by

The Systems Group

Runner-up

Christian Broadcasting Network (CBN)

Submitted by Calrec Audio



When civic leaders from Bethlehem, PA, decided to redevelop the old Bethlehem Steel mill into a new community center, it provided the town with a sorely needed reclamation project to boost the local economy. The new “Steel Stacks” arts and cultural campus also provided a new home for WLVT, the local PBS affiliate (channel 39), which would bring it closer to the local community and increase ratings for its local HD newscasts.

WLVT management called in veteran systems integrator The Systems Group (TSG) from Hoboken, NJ, to help it migrate from mostly tape-based SD operations to an IT-centric HD production and distribution environment.

A new two-story 29,000sq-ft building was constructed from the ground up, giving the station a chance to start from scratch and implement an end-to-end, file-based workflow.

TSG designed and implemented a networked production workflow including two HD-SDI production studios (“A” and “B”), a master control room, one production control room, an audio control room and six edit rooms (including three with Apple FCP and three featuring Avid Media Composers).

The new master control suite overlooks the street level of the new complex, where a large Panasonic LED display (15.54ft by 9.45ft) outside the building shows WLVT programming, announces upcoming community events and is a live feed when production is going on in the studios.

The building also features extra space in the form of an Educational and Cultural Center, which is open to outside clients to rent space and produce interviews in the production studio and distribute them via a 4.9m satellite dish on the roof. Clients can also finish programs in the FCP and Avid suites.

For the local community, the new building is a welcome addition, and the station’s newscasts ratings are sure to get a bit more competitive. ■



WABC Studio 77

Winner of new studio technology – network

Submitted by

The Systems Group

Runner-up

TV-3

Submitted by Ross Video



WABC recently unveiled its new flagship studio on the corner of 66th and Columbus streets in the heart of Manhattan. WABC requires a highly efficient, remotely controlled studio to support daily news and public affairs programming, as well as any special events that may arise. To accomplish this, Studio 77 is remotely connected to existing control room facilities located at 7 Lincoln Square, making these facilities accessible to all of WABC’s productions. WABC engaged The Systems Group (TSG) of Hoboken, NJ, to develop the conceptual design and launch the new operation under an aggressive project timeline.

To extend the capabilities of Studio 77 to each of three existing production control rooms, a considerable fiber-optic infrastructure was installed for most signal types. TSG deployed the BSS Soundweb London platform to handle all audio processing and transmission using a dedicated CobraNet audio network. To achieve a distinct on-air look, LCD monitors were used extensively throughout the set. To facilitate monitor control, WABC and TSG deployed a custom Crestron-based control system that is accessible locally and from each of the three remote production control rooms. The system allows individual control over each of the monitors, as well as the lighting, shades and exterior audio feeds. An extensive KVM infrastructure was deployed over WABC’s converged 10GigE network, including cloning all weather systems from the existing newsroom to a new weather center built into Studio 77.

The addition of eight new robotic cameras necessitated that the existing control system be replaced in a seamless, overnight cutover. Three cameras were added outside of the building to provide live video of the neighborhood, including one placed in the park across the street, fed back over an IP microwave link. To optimize the street-side experience for visitors, 14 outside-facing LCDs display a mix of the station’s air signal and real-time weather radar. ■



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KOMO-TV

Winner of new studio technology — HD

Submitted by

Wheatstone

Runner-up

The Gayle King Studio

Submitted by NEP Broadcasting



Photo courtesy Rob Purdy

Like many television stations, KOMO in Seattle had long been broadcasting using a fully HD-capable master control room. Its production facilities, used many times daily for its newscasts, were capable of 16:9 production, but not HD. That needed to change, said KOMO engineer John Reynolds.

That, combined with significant stability issues with audio and video equipment, necessitated an upgrade. The station chose an ELC newsroom automation system from Sony to streamline the news production workflow and a Sony MVS-7000X production switcher to handle video control. That left one key need unfilled: audio.

The existing audio console had long been considered rather complicated to operate; KOMO needed a stable, easy-to-use alternative. Several consoles were considered, but in the end, the need for more control flexibility and more mix-minuses led to the station's choice of the Wheatstone Dimension One, the latest network-based television audio console from that manufacturer.

Design work on the new control room began in April 2011. Construction began shortly thereafter with the assistance of Advanced Broadcast Solutions, an integrator that handled installation, wire management and documentation. The Sony ELC news production automation system's audio facilities are capable of controlling 48 logical faders, and the Dimension One was ordered to provide that exact number, an important consideration.

The upgraded news production control room is now in full-scale operation. Although the facility is occasionally used for commercial production, such sessions are difficult to schedule because of the need to produce newscasts throughout the day. The project's ultimate goal — to produce HD newscasts, important in today's competitive television market — seems to have been well satisfied. ■



Microsoft Production Studios

Winner of new studio technology — non-broadcast

Submitted by

Diversified Systems

Runner-up

Austin City Limits

Submitted by Sony



Diversified Systems completed an upgrade for Microsoft Production Studios (MSPS) in Redmond, WA. The project expands the existing phase, control room and distribution systems to enable 1080p60 HD multiformat production. The systems are designed around 3Gig progressive video formats, thus completing Microsoft's migration to a fully file-based workflow.

The HD upgrade is part of a multiphase series of projects. In this phase, the production control room was outfitted with a Sony MVS-8000X switcher, NEC S461 monitors driven by Miranda multiviewers and Sony PVM-2541 OLED monitors. Surround and stereo audio mixing employs live mixing consoles and Pro Tools for DAW editing and sweetening.

The technical center was updated with Evertz 5601MSC redundant sync generators, EVS XSDPH 3Gig video servers connected to the DataDirect Networks SAN, an Avocent HMX KVM matrix feeding into an Ensemble Designs BrightEye Mittos for 1080p screen captures, a Miranda NVISION FR8576 router, and Miranda terminal equipment. Additional services are enabled by the new Sony cameras, configured for use throughout the Microsoft campus and carried over a fiber-enabled network of bi-directional signal transports and control systems.

One key update involved outfitting the entire infrastructure to use high-resolution video and computer systems, provisioned through a centralized video monitoring system comprised of 3G screen-capture equipment. The facility now links and enables a full file-based workflow over GigE and Fibre Channel to numerous editing suites, the DDN SAN and an LTO-tape-based archive.

The design and implementation was completed in nine months while production operations continued. The facility now provides studio, editorial and related production services to clients needing full-service production/post-production, transmission and distribution services. ■





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NHL Network

Winner of
station automation

Submitted by

Comcast

Runner-up

WJLA-DT & NewsChannel 8

Submitted by The Systems Group



In late 2011, Comcast Media Center (CMC) launched the new NHL Network program origination operation in Comcast's Dry Creek facility. The NHL looked to employ the latest technologies and practices to enhance the on-screen experience and overall quality of its broadcast. It turned to the CMC to provide scheduled and live-event origination as well as distribution services.



The NHL Network's goals for the new origination operation included enhancements to the NHL Network ticker, in-game production-grade graphics, alternate-market programming and improved overall signal quality via a new compression platform that maintains native HD programming to the receiving affiliates.

In the facility, two MCRs are located immediately adjacent to each other within a short distance of the CMC central equipment room. The control rooms each include full-featured systems that offer advanced control over dynamic scheduling, as well as on-screen contribution elements.

The addition of a multi-protocol label switching (MPLS) terrestrial fiber network connects nearly all of the North American hockey arenas to both the NHL studio operations and CMC via terrestrial fiber, yielding significant inbound feed capacity.

CMC's in-house Software Solutions Group provided automated traffic log conversions that saved the NHL and CMC programming staff many hours of time. They also worked closely with Chyron and Reality Check Systems on logical placeholder-style graphics scenes to ensure on-air elements could be updated dynamically with minimal effort from in-room staff.

CMC leverages the multi-protocol label switching network to acquire content, graphics and ticker data, in addition to sourcing venue feeds, enabling cost-effective delivery of multiple elements over a single platform. ■

The Switch

Winner of
network automation

Submitted by

Beers Enterprises

Runner-up

Disney/ABC Television Group

Submitted by The Systems Group



In April 2011, The Switch announced an aggressive expansion plan to scale its current network from six cities to 50 cities. After soliciting requests for proposals for a network mesh solution from fiber transmission carriers in North America, the switching service selected AT&T.



The next step was to evaluate the providers of long-haul fiber mux/demux equipment. Ultimately, Net Insight's Nimbra solution was selected for its ability to transport video formats including uncompressed 3G and HD-SDI, compressed HD (JPEG2000), and 270Mb/s SDI. Additionally, the switching service chose Miranda Technologies to supply 3G video routing switchers and its iControl centralized control solution.

In phase one of the expansion, the fiber network uses 20 NVISION 8500 Hybrid routers to connect each of the new switching facilities. The system design and integration was performed by Beck Associates.

The next challenge was to incorporate elements that would allow for enhanced network automation. For resource allocation management and scheduling, the switching service used the ScheduLINK system from ScheduALL. This system, in tandem with the Nimbra Vision and iControl, gives customers the ability to book any media resources needed for transmission configuration, as well as the scheduling and management of occasional use fiber circuits and bandwidth.

Fifteen cities had become operational as of November 2011. The Switch will roll out the additional 29 locations in three phases, with five additional U.S. locations in 2011, and 24 locations in Canada and other top U.S. media markets in 2012.

The Switch also has invested in upgrades to its customer-controlled user interface, with plans to launch a next-generation, Web-enabled customer control system to be deployed on users' touch screens. ■



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KWQC

Winner of newsroom technology

Submitted by

Grass Valley

Runner-up

Arqiva DSNG Fleet

Submitted by Ericsson



In August 2010, independent station group Young Broadcasting decided to undertake an end-to-end HD news production upgrade, from the field equipment all the way to the production systems. This included the installation of Grass Valley HD digital news production technology at KWQC, its NBC affiliate in Davenport, IA, to help the station migrate to local HD news operations. The upgrade was done with the idea that the shared-storage system would improve efficiencies and get more news content to air faster.



Now that that system has been on the air for more than a year, station personnel there now collaborate more effectively, and stories get to air faster than ever — often beating the local competition. In fact, the news experiment has gone so well that the Young Broadcasting station group now has decided to upgrade the news departments of eight of its 10 stations to Grass Valley's networked, file-based, HD news production and distribution system.

At each station, a revamped news department will include 25 seats of Grass Valley EDIUS 6 multiformat editing workstations, two K2 Summit production clients, and Aurora Playout software modules and client computers for automated playout.

The EDIUS 6 nonlinear editing software running on standard PC workstations allows the stations to turn around news stories quickly. The Grass Valley Aurora Playout system offers highly coordinated news playback from the K2 Summit.

The stations involved will use the EDIUS NLEs to cut daily news packages while the Aurora Playout software, in tandem with the K2 Summit servers, will enable the stations' staff to automatically schedule their newscast rundowns while still retaining the ability to insert breaking news segments, or go live from the scene, at the last minute. ■

CNN Washington Bureau

Winner of post & network production facilities

Submitted by

Lawson & Associates, Architects

Runner-up

Crawford Media Services

Submitted by Harmonic



The CNN Washington Bureau expanded its operation onto a new floor of its building in April 2010. The D.C. Bureau's new 8th-floor operation will be used primarily as an open work area for the bureau's assignment desk, political coverage unit and show staffs. It also includes live stand-up positions, extensive RTS intercom connectivity and four robust video conference room facilities.



The new floor also offers an enhanced work environment for the staffs that migrated there. Previously, the shows, coverage beats, assignment desk and executives had been segregated on separate floors. Even the desk, which had occupied a single space before, was handicapped by poor acoustics and intruding structural columns.

With the opening of the new floor, the most dramatic innovation introduced was that the assignment desk, the beats, the situation room, "John King USA," the political unit and bureau management all share a single common floor. In a significant environmental change, offices were clustered around the building core, giving window views and natural light to the open workspace areas.

In bringing all the groups together, the designers focused on improving communication, even eye-to-eye contact. At the assignment desk, workstations, custom-made by dTank, are arranged in two large semicircles with a minimum of obstructions between desks, and attention has been paid to improved acoustics. Adjacent to the assignment desk is a robotic camera with low-profile LED lighting that allows for quick live reports with a minimum of interruption to the working desk. The desk is able to communicate with CNN headquarters in Atlanta, as well as studios and control rooms through RTS intercom panels.

On the opposite side of the floor, overlooking the network's political unit, is another stand-up position used for hourly updates on campaign developments. The 8th floor of the CNN Washington Bureau has flair, form and, most importantly, functionality. ■

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www.azdencorp.com

Booth: C1120

DIGITAL MIXING CONSOLE Studer Vista 5 M2

Now has an upgraded M2 version with the optional addition of a new, integrated TFT metering system introduced on the Vista 9 console; when the TFT meter bridge is fitted, the console's external GC screen becomes an integral part of the chassis; available in two frame sizes, 32 and 42 faders wide.

www.studer.ch

Booth: C2619

AUDIO CONSOLE Calrec Artemis Light



Introduces compact processing rack that delivers digital signal processing and routing capabilities in a 4U enclosure; can be fully integrated with any existing Hydra2 network; features same control surface used by Artemis Shine and Beam.

www.calrec.com

Booth: C1746

AUDIO MIXING CONSOLE Solid State Logic C10 HD



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

www.solidstatelogic.com

Booth: C2013

AUDIO LOUDNESS METER DK-Technologies DK3

New version features a 3G HD/SDI video input for de-embedding audio from a video stream; enables use with any 5.1 audio format, including analog, AES and SDI; ITU-, EBU R128- and ATSC-compliant; can be powered by USB port for on-location recording.

www.dk-technologies.com

Booth: C9942

LOUDNESS QUALITY MONITOR Linear Acoustic AERO.lite

Represents a compact, dual-channel system for loudness problems and CALM compliance; able to extract audio from applied SDI pairs, as well as from the AES and analog inputs; includes an AEROMAX processing engine processes audio with, and is available at the AES, analog, or SDI output with the ability to re-embed the signal into any or all SDI pairs.

www.linearacoustic.com

Booth: N3737

MULTICHANNEL LOUDNESS PROCESSING OVER IP

Cobalt Digital LMNTS

Ideal for MVPDs and MSOs where a large number of diverse programming sources must be simultaneously controlled; can operate with diverse audio codecs, extracting the packets from program streams, performing AEROMAX loudness management in the PCM domain, and then re-encoding and re-packeting the audio with its stream; all data connection is via GigE IP interfaces over an industry-standard IT hardware platform, with no intermediary breakouts.

www.CobaltDigital.com

Booth: N1929

AUDIO CONSOLE Wheatstone D-5.2



Intended for major market live news; each input fader strip includes seven alpha displays for quick visual feedback of current source, alternate page source, A & B pre-sets, bus-minus destination, channel mode and gain setting; features comprehensive IFB capability; includes 18 dedicated mix-minus buses with confidence feeds plus direct mix-minus (bus minus) feeds from every input channel; can be configured from 12 to 128 input faders.

www.wheatstone-tv.com

Booth: C2615

DIGITAL AUDIO PROCESSOR Jünger Audio D*AP LM4



Four-channel digital audio processor; features onboard AES/EBU digital I/O, along with optional 3G/HD/SD-SDI I/O or analog I/O; incorporates version 2 of the company's LEVEL MAGIC adaptive loudness algorithm, which is compliant with all current broadcast audio loudness recommendations, including ITU 1770 (versions 1 and 2), ATSC A/85, ARIB TR-B32 and EBU R128.

www.junger-audio.com

Booth: SU3604



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AUDIO CONSOLE Wheatstone D-8



Intended for live audio mixing in medium and small market stations, remote trucks, or secondary on-air/production rooms in larger facilities; features 30 motorized faders, 24 input channels, four submasters, two main buses and two aux buses; enables surround mixing; includes extensive on-board processing; incorporates touch-screens for metering and for lesser used, set-and-forget controls; offers up to 32 channels of mix-minus/N-1 outputs, surround panning and per-channel delay.

www.wheatstone-tv.com

Booth: C2615

AUDIO CONSOLE Calrec Apollo

Ergonomic design makes two layers of channels available simultaneously, providing users more control; uses Bluefin2 high-density signal processing system; has maximum capacity of 1020 channel processing paths, 128 program busses, 96 IFB/track outputs and 48 auxiliaries.

www.calrec.com

Booth: C1746

SOFTWARE UPDATE Lawo v4.16 software

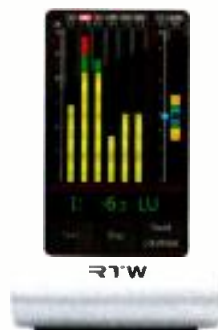


Doubles the available DSP channel count for mc2 series mixing consoles; after installation, the current DSP boards offer 96 channels instead of the 48 channels; new "broadcast channels" offer a feature set adapted specially for broadcast applications, using a simplified signal flow while maintaining sound quality.

www.lawo.de

Booth: C2046

LOUDNESS METER RTW TM3



Latest addition to the TouchMonitor range for pro-level loudness, true-peak and PPM metering for analog and digital stereo and 5.1 signals; includes the features of the larger TM7 and TM9 versions; controlled using a touch-sensitive display; instruments include single-channel and summing bar graphs, an LRA instrument and numerical displays; basic version handles analog and digital stereo audio, while the 5.1 option adds the support of six-channel digital input.

www.rtw.de

Booth: C1844

SOFTWARE UPDATE Solid State Logic V4

Software for the C100 HDS digital broadcast console offers new features and options designed to increase capability, productivity and connectivity; C-Play feature embeds a professional audio playout system into the console surface, delivering superior ergonomics for the operator and integrated recall of playlists with console projects; includes integration with Mosart Medialab newscast automation; adds existing support for Sony ELC and Ross Overdrive; full-duplex connectivity with Riedel RockNet audio networks expands compatibility with installed audio networks.

www.solidstatelogic.com

Booth: C2013

LOUDNESS METER TC Electronic

Native plug-and-play available for transporting audio in various formats; features Loudness Display, history in a single, easy-to-view; loudness history can be set from one minute to 24 hours; loudness and other key information can be exported as a standard formatted text file and imported into a spreadsheet.

www.tcelectronic.com

Booth: C2852

AUDIO LOUDNESS METER DK-Technologies DK Meter software update

Compact Audio Loudness Meter (CALM) has been upgraded with new software (V.2011-12-06), designed to enhance the user experience and improve the meter's performance; meter is no bigger than a smartphone; comes in two versions — the stereo DK1 and the 5.1 surround sound DK2; accepts digital inputs; supplied with all known loudness measurement recommendations, as well as the standard DK-Technologies meter scales.

www.dk-technologies.com

Booth: C9942

DIGITAL AUDIO PROCESSOR Jünger Audio T*APT V Audio Processor



Wideband eight-channel processor (8x1, 4x2 or 6+2) focuses on automatic and adaptive loudness control; handles digital inputs (AES) and, through interface slots, all other usual audio formats, including all SDI versions (SD, HD, 3G); offers dynamic equalization so that the sound can be "colored;" incorporates version 2 of the company's LEVEL MAGIC adaptive loudness algorithm, which is compliant with all current broadcast audio loudness recommendations, including ITU 1770 (versions 1 and 2), ATSC A/85, ARIB TR-B32 and EBU R128.

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Booth: SU3604



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AUDIO ROUTER Solid State Logic Alpha-Link LIVE-R



Adds a set of redundant MADI fiber-optic connections to the existing I/O unit; reduces the number of cables required for redundant fiber system installation and doubles the amount of audio signals that can be passed between the C10/C100 and the B-RIO I/O unit; features MADI I/O locked to C10 HD/C100 HDS stable clock, 24 balanced analog I/O, 12 pairs of AES digital I/O, embedded control data to simplify cabling and operation, analog I/O metering via 24 tricolor LEDs, 2RU enclosure, and redundant PSUs.

www.solidstatellogic.com
Booth: C2013

MADI ROUTER Lawo Nova29

Connects up to 16 MADI clients within a broadcast center, be it mixing consoles or external equipment; 1024 x 1024 I/O can be switched transparently; suitable for the transfer of proprietary formats, such as Dolby E; designed for use as a universal router for modern, mid-size broadcast facilities; 1RU size.

www.lawo.de
Booth: C2046

AUDIO ROUTER Calrec Hydra2 Operator (H2O)

Remote accessibility provides enhanced flexibility of the Hydra2 network router; allows user control of network independently from any console control surface including Tablets, laptops or PCs with a browser; ports can be arranged into folders for faster location; allows for central management of network synchronization; compatible with all major operating systems, including Windows, Linux and OS X.

www.calrec.com
Booth: C1746

AUDIO DISTRIBUTION AMPLIFIER Cobalt Digital 9257



Card-based system for AES10 MADI signal distribution; supports sampling frequencies up to 96kHz, with a 64-channel payload supported at industry-standard 48kHz sampling rate; also supports other sampling rates specified as valid per AES10-2003 at various payload capacities; reliably equalizes up to 250m of 1694A; features MADI audio embedder/de-embedder.

www.cobaltdigital.com
Booth: N1929

SIGNAL PROCESSOR Harman Soundweb London BLU-800



Features configurable I/O and signal processing, as well as CobraNet audio with primary and secondary ports for fault tolerance; a low-latency, fault-tolerant, 256-channel digital audio bus uses standard Cat-5e cabling to give a distance of 100m between compatible devices.

www.harmanpro.com
Booth: C2619 (Studer)

AUDIO ROUTER Riedel Communications MediorNet Compact



Provides a network bandwidth of 50Gb/s — enough capacity for bidirectional transport of 12 HD-SDI signals, dozens of MADI streams or GigE signals, and hundreds of audio channels or intercom ports; provides connectivity for four analog audio I/Os with mic preamps and a dynamic range of 117dB; additional features include an interface for Riedel RockNet digital audio networks, two DisplayPort outputs and three GigE ports.

www.riedel.net
Booth: C4337

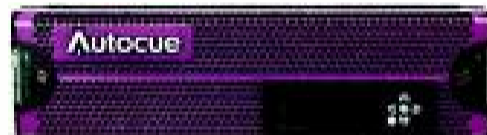
AUDIO PROCESSING Utah Scientific Embedded Audio Signal Processing

New line of I/O boards enable embedded audio signal processing for the UTAH-400 series digital routing switchers; boards rely on field-programmable gate array (FPGA) technology; boards deserialize and decode a signal into its component data streams without compromising the router's overall operational reliability; audio channels are shuffled automatically without an outboard device or manual intervention.

www.utahscientific.com
Booth: N4511

Automation, including news and master control

VIDEO SERVER Autocue/QTV Video server



New firmware provides additional support for Avid and Apple editing workflows, with new OP-Atom and ProRes formats and improved handling of QuickTime, DNxHd and XDCAM content; provides scheduled playout of clips sequences with both local and remote access to playlists; supports 608 and 708 closed captions; transcoding can be triggered on demand from a predefined list of encode profiles.

www.autocue.com
Booth: C8525

AUTOMATED CONTENT PLAYOUT PlayBox Technology AirBox MPO

Enables different video formats and different outputs to run at the same time from a single AirBox playout server; enables the running of two or more outputs so that broadcasters can easily provide parallel outputs in any combination needed to deliver the content; SDI in HD, SDI in SD (with real-time rescaling) and IP streaming is one example, or alternatively output in H.264 (MPEG-4) and MPEG-2 at the same time.

www.playbox.tv
Booth: N5834



The talk of broadcast.

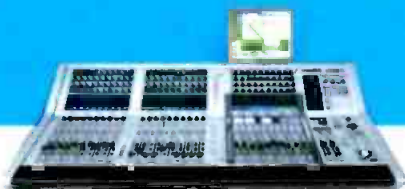
From local radio to large-scale live television productions, we provide powerful and intuitive digital mixing solutions that help to create the memorable events in broadcasting.

OnAir 1500
DIGITAL MIXING CONSOLE

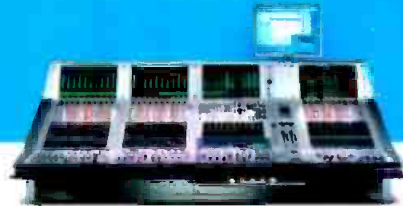


NEW

VISTA 5 M2
DIGITAL MIXING SYSTEM



VISTA 9
DIGITAL MIXING SYSTEM



More Info

Scan with your smartphone
for full details of Studer
broadcast consoles



NABSHOW
Where Content Comes to Life

NAB BOOTH C2619

usa.studer.ch

STUDER
by HARMAN

SCHEDULING SYSTEM

MediaGeniX WHATS'On Generation 4

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

www.mediagenix.tv

Booth: N6331

AUTOMATION SYSTEM

Myers Information Systems ProTrack TV

Comprehensive, scalable broadcast management system connects traffic, scheduling, sales, engineering and IT departments; serves as centralized unifying element within a broadcast operation; integrates seamlessly with existing infrastructure to optimize workflow and preserve existing investments.

www.myersinfosys.com

Booth: N4616

AUTOMATION SYSTEM

Miranda Technologies Enterprise Suite

Streamlines content preparation for broadcast playout and VOD publishing; enables playout operators to review, normalize and approve file-based content before it goes to air, lowering risks during playout; simplifies the normalization of program and advertising content for iTX customers, using automated workflows for analysis, review and fixing of the most important file issues; this normalization offers support for AFD tagging, high-quality up/down video conversion, audio loudness correction, channel tagging and downmixing, as well as support for closed captions/OP47 subtitles.

www.miranda.com

Booth: N2512

BRANDING, PROMO SYSTEM

Chyron Channel Box² (v4.6)



Features 2D/3D design with a complete data acquisition toolset for all branding applications; v4.6 software introduces an asset viewer that allows an operator to validate, package and query assets, as well as new data binding tools for improved panel control; additional new features include locking scenes and copy/paste/reverse functionality, all of which can be coupled with a scene list that allows groups of scenes to be created and stylized.

www.chyron.com

Booth: SL1510

SERVER CONTROL SYSTEM

HiTech Systems AViTA News



System controls video servers for clip or playlist playout; includes multiple hardware panels and software applications; interfaces via MOS to a newsroom computer system; status of each clip is fed back to the NRCS, including notifications of missing clips; allows multiple server port control from one panel; designed to interface with any video server using industry-standard professional control protocols.

www.hitechsys.com

Booth: N5020

AUTOMATION SYSTEM

NVerzion CLASS

Component Level Automation System Solutions ideal for stations with four or more channels; can be scaled up to accommodate hundreds of channels; provides system-wide control for ingest, traffic, graphics and playout; interoperable with all manufacturers and common traffic systems.

www.NVerzion.com

Booth: N4912

NEWSCAST AUTOMATION

Mosart Newscast Automation 3.0

Newest version features a redesigned graphical interface with full user configurability; story elements such as cameras, clips and graphics can be assigned to buttons for quick access; range of interface overviews also can be assigned to buttons, making the GUI a shot box for touch screens; story scripts are shown directly in the Mosart GUI; operators can store clips and graphical elements in a pool ready for on-request execution.

www.mosart.no

Booth: N1820

REDUNDANT REMOTE PLOUT

PlayBox Technology EdgeBox

Provides tapeless file-based operation with two parts: one integrated with the broadcast center and the other at the remote site; at the broadcast center, it is fully integrated into the current or preferred systems, including traffic, storage, MAM, ingest, transcoding and file transfer systems; this connects to the new remote EdgeBox site's playout equipment via the Internet, providing a cost savings over dedicated fiber or satellite links.

www.playbox.tv

Booth: N5834

CHANNEL IN A BOX

Snell ICE v3.0



New features include integrated 3D graphics and CG functionality with timeline control and the ability to populate fields from Morpheus automation schedule events, as well as external data sources; a new content validation feature analyzes source material as soon as it's available to prevent invalid formats or impaired content from reaching the on-air output; integrated SAN storage brings high-performance shared storage to the platform, as well as aids in optimizing system performance and overall broadcast workflows.

www.snellgroup.com

Booth: N1820

CONVERTERS FOR PROFESSIONALS

VERSATILE • AFFORDABLE • RELIABLE



matrox MC-100

Dual SDI to HDMI Mini Converter for 3G/3D/HD/SD
Monitor • Distribute • Switch • Multiplex • Converge

Matrox MC-100 lets broadcast engineers and AV professionals satisfy their diverse needs when it comes to managing SDI signals within their environments - for monitoring, distributing, switching, multiplexing, and processing 3D in real time. Until now, you have been forced to purchase different devices to perform these tasks. The new Matrox MC-100 solves all these challenges in one inexpensive, easy-to-use device. It is a dual SDI to HDMI mini converter that supports a wide range of display resolutions through 3G, Dual Link, HD, and SD-SDI. This single portable unit can be used as a HD-SDI switcher, a distribution amplifier, a multiplexer, and a 3D processing unit, making it the most versatile mini converter on the market. It should be in every video professional's toolbox.

matrox Convert[®] DVI Plus

HD-SDI Scan Converter with Genlock and Region-of-Interest Support

Matrox Convert DVI Plus lets broadcasters easily and economically take the computer-based content that is quickly becoming a key part of the nightly news to air. It's ideal for creating broadcast video from computer applications such as Skype, YouTube, Google Earth, video games, weather radar, maps, and web browsers, as well as citizen journalists' mobile phone videos.



NAB 2012 — Booth SL5115
www.matrox.com/video/converters/be
1.800.361.4903 (US and Canada), 514.822.6364

Matrox is a registered trademark. Matrox MC-100 and Matrox Convert DVI Plus are trademarks of Matrox Electronic Systems Ltd. All other trademarks are the property of their respective owners.

matrox[®]
Digital Video Solutions

2012 DTV MARKETPLACE

REMOTE AD INSERTION

AVECO Remote Ad Insertion



Cost-effective system to generate additional revenue by enabling higher priced ads that are specific to viewers in that region; various configurations enable ad selection to be controlled from the hub or provide shared control from the hub and the regional station; the company has teamed up with Thomson Video Networks to offer this system.

www.aveco.com
Booth: N2138

VIDEO SERVER

Floral Acuitas

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

www.floral.com
Booth: N5823

AUTOMATED PRODUCTION CONTROL SYSTEM

Ross Video OverDrive v12



New version offers HotSwap to switch between OverDrive servers, DeviceSwap to manage sync rolling of video servers, and FrameSwap to allow two Vision switchers to be operated synchronously from a single OverDrive system; provides support for traditional Chinese text, .5MLE Vision switcher models and device status indications in GlobalView.

www.rossvideo.com
Booth: N3807

Camera support, robotics, virtual sets, batteries

BATTERY

Anton/Bauer QRC-CA940 Gold Mount

Helps streamline battery management for Canon EOS C300 users; provides 7.2V power via DC connector and 14.4V on three PowerTap connectors; designed to be compatible with mounting brackets for 15mm or 19mm rod systems, the MATRIX Cheese Plate, or adapted to third-party support systems (15mm or 19mm clamp kits sold separately).

www.antonbauer.com
Booth: C7032

PHANTOM POWER SYSTEM

BHV Broadcast Video Ghost



Developed as a low-cost, reliable alternative to traditional batteries; provides 60W of power at 12V for camera head-ends and remote monitors using the existing serial digital video cable; can be used with SD and HD signals; can power composite to SDI converters at the camera, avoiding significant signal degradation suffered by composite video over distances.

www.bhvbroadcast.com
Booth: N4920

CAMERA CONTROL SYSTEM

Shotoku Gemini Pan Bar Control System

Merges two products from Shotoku's robotics and manual VR tracking ranges to provide a remote pan/tilt head that synchronizes with the manual head to act as one; allows operators to work remotely in comfort and safety while capturing events close-up and at almost any speed.

www.shotoku.tv
Booth: C8528

ELEVATOR PEDESTAL

Telemetrics EP5 Televator

Redesigned to offer greater speed and travel range, along with a wider range of installation options; the unit's floor, flex track and now ceiling-mountable configurations make it ideal for a range of production applications; features quiet operation; remotely controlled motorized telescoping tripod offers the benefits of pedestal height control, as well as an auxiliary control serial interface and positional servo control; is convergent-capable.

www.telemetricsinc.com
Booth: C9529

Cameras, lenses, accessories

DIGITAL CINEMA LENS

Canon CN-E30-300mm T2.95-3.7 LS

Designed to fulfill contemporary 4K production standards; 30mm to 300mm focal length; incorporates geared inner focusing to minimize focus-induced changes in the angle of view, reducing focus breathing; 11-blade aperture diaphragm for smooth out-of-focus areas; T2.95 from 30mm to 240mm, T3.7 at 300mm; weighs 12.8lb; available in PL mount.

pro.usa.canon.com
Booth: C4325

CAMCORDER

Sony NEX-FS100U Super 35mm

Uses Exmor Super 35 CMOS sensor that is almost twice the size of a Micro 4/3 sensor; records using AVCHD and shoots with maximum frame rate of 1920 x 1080/60p (28Mb/s); records to compatible memory stick Pro Duo media and SD/SDHC/SDXC memory cards; can be used with optional HXR-FMU128 flash memory unit for extended, continuous recording or instant backup; pixels are four times bigger than those in current digital SLRs.

www.sony.com/professional
Booth: C11001



See It. Take It.



See It

Now you can look at your source before you do a take. The exclusive live thumbnail display in the 9430 Avenue Router panel shows you the source before you take it to air. And it does so without the need for external monitors or a monitor bus output on the router. Video monitoring plus indicators for synchronicity and timing, audio, closed captions and AFD give you confidence that your source is ready to use.

Take It

It's the best of both worlds, a router and a clean switch all in one. The clean switch gives you full frame synchronization that locks to your house reference so it can even switch cleanly between asynchronous sources. Flawless audio sample rate conversion makes the 9430 truly Clean and Silent.

Choose Your Size. Then Choose Again. And Again.

Highly flexible matrix sizing lets you decide on your own configuration. The basic size is 8x2. Add user-configurable input or output ports all the way up to 28x2 or 8x22 – and any sizes in between. Maybe a 10x5 or a 15x15? You choose. It's a future-proof design that lets you easily reconfigure at your convenience.

And this router supports any signal you have or will have in the future – HD, SD, 3 Gb/s, ASI and 310M. Built-in black, bars and tone save you some router real estate. Plus you get a five-year warranty and free software updates forever.

Whether you need a bypass switcher for your master control, or if you have an off-site news bureau or radio show, or maybe you have a mobile truck or helicopter, this router is one you need to see.

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Visit us at NAB N2524

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TELEPHOTO LENS

Fujinon XA20xs8.5BERM



Features a 2X range extender, an ergonomic digital servo, Quick Zoom and inner focus, as well as improved corner resolution; designed for applications from newsgathering to in-studio use; can be used with rear controls for zoom and focus; suitable for tripod use.

www.fujinonbroadcast.com

Booth: C7525

LENS DATA SYSTEM

Thales-Angenieux ADS/i

Enables film and digital cameras to automatically record key lens data to be provided digitally to post-production teams; allows monitoring and transfer of key lens data such as focus distance, depth of field, focal zoom position and iris setting; DPs can also save and upload lens profiles onto memory cards for easy zoom lens swap, lens calibration, lens synchronization and post-production analysis; useful for many applications such as lens position monitoring, stereoscopic 3-D acquisition, virtual studios and special effects.

www.angenieux.com

Booth: C6019

SLOW-MOTION CAMERA

I-MOVIX X10



Delivers real-time, continuous extreme slow-motion in full HD at 300fps (or 600fps in 720p); used with an EVS XTE production server under LSM control; designed for continuous slow motion at frame rates in excess of existing systems.

www.i-movix.com

Booth: C4644

PTZ CAMERA

Camera Corps Q-Ball Pre-Set



Allows 18 shot settings to be stored prior to a live or real-time recorded shoot; all settings are saved in non-volatile RAM and remain safely stored even if the system is powered down between rehearsal and actual performance.

www.cameracorps.co.uk

Booth: C9046

COMPACT STUDIO SYSTEM

JVC ProHD Compact Studio



Configures the GY-HM150 ProHD handheld camcorder for a studio environment using two new accessories — the HZ-HM150VZR ProHD remote lens control and the DT-X71 ProHD monitor; HZ-HM150VZR plugs into the 3.5mm remote connector on the right side of the camcorder and offers professional-style zoom control via a wide sweep variable rocker; DT-X71 series of portable monitors includes three models with scaled I/O options and adjustable 16:9/4:3 display.

pro.jvc.com

Booth: C4314

CAMCORDER

Sony HXRNX70U

Uses Sony Ultra-wide Angle 26.3mm G lens to capture images out to the corners of the frame; lens has assignable lens ring that allows manual adjustment of focus, iris and zoom; records at 1920 x 1080 60p full HD at 28Mb/s; built-in GPS receiver allows viewing current location coordinates on the 3.5in, touch-screen XtraFine LCD display; IPX54 certification for shooting in rainy and dusty conditions.

www.sony.com/professional

Booth: C11001

PTZ CAMERA

Panasonic AW-HE100



Features pan/tilt head with a range of 350° pan and 250° tilt, three 1/3in CCDs, an f1.6 zoom lens, a 19-bit video processing DSP and a 14-bit A/D converter; standard configuration includes HD/SD analog component and composite video outputs, RS-422 and IR remote control; compatible with all of the company's current pan-tilt camera control systems.

www.panasonic.com/professional

Booth: C3607

CAMERA

Canon EOS C300



Features Super 35-size CMOS sensor (24.6mm x 13.8mm); records in 50Mb/s 4:2:2 long-GOP MPEG-2 codec; unique readout technique provides full-bandwidth individual RGB video components without de-Bayering; compatible with Canon's existing line-up of EF and new EF Cinema lenses as well as accessories from third parties; records to CF cards.

pro.usa.canon.com

Booth: C4325

VIEWFINDER

ViewZ VZ056F-3G

Features 5.6in LED screen with 1280 x 800 resolution; 3G-SDI input; 1:1 pixel mode; includes waveform, vector scope, UMD, jog dial; HDMI to SDI active loop through; 0.5W power consumption.

www.viewzusa.com

Booth: C3940



Calm. Cool. Collected.

The T*AP is an 8 channel processor (8x1, 4x2, 5.1+2) primarily designed for TV playout, ingest, production and post-production facilities.

Calm because I know we comply with the C.A.L.M. Act with the easy to set up T*AP Television processor. **Cool** because I know that my audio mix retains its original character, without artifacts or digital noise. **Collected** because I know I can rely on Junger Audio processors, with 20 years industry leading experience.

- Loudness control according to EBU R128, ITU.1770-2, ATSC A/85 (ITU.1770-1)
- Detailed loudness monitoring and metering with optional LoudnessLogger GUI
- Multi-Loop Wide Band Adaptive Algorithm Design
- 3G/SD/HD SDI Embedded Audio optional
- Level Magic II = Adaptive AGC + Transient Processor
- Dynamics Section (Compressor / Expander)
- Spectral Signature™
- Brickwall True Peak Limiter
- Front Panel Operation w/Preset Recall
- Browser Interface based Setup and Configuration
- 8 Channel Processing + Stereo monitor input
- AES 75 Ohm Digital In/Out
- Front panel loudness meter compliant to EBU R128

Jünger

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D*AP LM2 Digital Audio Processor

2-channel Digital Audio Processor incorporating Version II of Jünger Audio's renowned LEVEL MAGIC™ algorithm, which is compliant with all current broadcast audio loudness recommendations including ITU, EBU R128 and ATSC A/85.



D*AP LM4 Digital Audio Processor

4-channel Digital Audio Processor incorporating Version II of Jünger Audio's renowned LEVEL MAGIC™ algorithm, which is compliant with all current broadcast audio loudness recommendations including ITU, EBU R128 and ATSC A/85.

2012 DTV MARKETPLACE

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PRODUCTION VIEWFINDER TV Logic LVM-074W



7in viewfinder features WSVGA (1024 x 600) resolution and a 170-degree viewing angle; provides SDI/HDMI I/O with HDMI-SDI converted output and temperature-adaptive color; also features H/V image flip with automatic 180-degree pivot; tally-out with optional tally; solid magnesium body.

www.tvlogicusa.com

Booth: SL5005

**CGs, prompters,
captioning**

SUBTITLING SYSTEM

Screen Subtitling Systems 3DITOR

Adds new disparity mapping module; enables stereoscopic subtitler to view visual representation of object disparity in each frame by means of pin-graph; allows operators to precisely place the subtitle in a safe area within the frame, avoiding any detrimental occlusions; disparity pin-graph offers a view of the 3-D frame from any angle to assure accurate subtitle placement.

www.screen.subtitling.com

Booth: N5816

**Graphics, animation
products**

GRAPHICS SYSTEM

FOR-A SmartStudio

Provides real-time character generation, clip recording and picture-in-picture capability within a single unit; suited for use in live event production, studio production and webcasting; powered by the company's MBP-1244 video platform, which delivers 4:4:4 RGB signal processing and an improved PC-based, real-time graphics system; video I/O board supports one HD-SDI (1080i) or SD camera and three additional video sources.

www.for-a.com

Booth: C5219

GRAPHICS CREATION

NewTek LIGHTWAVE 11

Performance has improved for the IK rigs to speed up character animation; speed boost has been added to scene and object loading, up to 7X faster; improved workflow includes a node search function, a node tree list and faster access to the morph mixer interface; other key features include: instancing (mass duplication of objects), flocking (creating natural motions within large groups), fracture (pre-fracture objects ready for destruction), bullet dynamics, Goz interchange tool, render buffer enhancements and FiberFX enhancements.

www.newtek.com

Booth: SL5111

REAL-TIME MOTION GRAPHICS

Ross Video XPression v4.0

Upgrade allows users to load multiple projects simultaneously, or even single graphics, without disrupting on-air operation; in a MOS newsroom environment, XPression now can apply different styles to the same graphics in a rundown; features new animated text effects, more 3D primitives, new shader types, a 64-bit video codec, Spell Check, better data handling, a new custom keyboard and a new NLE plug-in for Grass Valley Aurora editing systems; supports Avid Command and Mosart production automation.

www.rossvideo.com

Booth: N3807

**Intercom, IFB
products**

WIRELESS AUDIO SYSTEM

Shure Axient

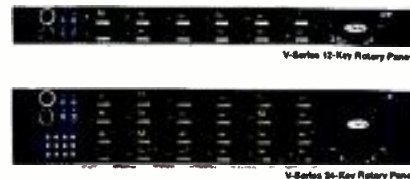
Wireless microphone system can automatically change frequencies — undetected by the user — to avoid interference; detects RF interference and moves to a clear and compatible frequency in milliseconds; has frequency diversity, which transmits full-bandwidth audio on two separate frequencies to ensure seamless, uninterrupted audio for mission-critical channels.

www.shure.com

Booth: C1610

INTERCOM CONTROL PANELS

Clear-Com V Series rotary panels



Available in 1RU, 2RU, desktop and extension panel variants; feature push-listen with mix control knob and a separate push-talk button for talk-and-listen monitoring; colored LEDs show keys that are active, who is calling and what the talk key is programmed to do; have dual use as intercom and/or assignment panels for IFBs, partylines and groups, even when using expansion panels.

www.clearcom.com

Booth: C8008

WIRELESS HEADSET

Eartec Digicom Digital Wireless

Allows up to four people to communicate simultaneously; operates in full duplex wireless mode, meaning transceivers send and receive signals concurrently; no hardware to install permanently as the system does not use a remote antenna or base station repeater; has range up to one-quarter mile; lasts eight hours on full battery; no FCC license is required.

www.eartec.com

Booth: C8230

INTERCOM BELT PACK

JK Audio Interloop



Works with industry-standard two-wire, party-line intercoms, connecting to the existing intercom system like any other belt pack; pairs to a Bluetooth headset for wireless operation; pairs to a cell phone to let others listen in; pairs to a notebook or laptop to provide remote voice access using communications applications such as Skype; powered by intercom with 9V battery backup; weighs 10oz.

www.jkaudio.com

Booth: C151

2012 DTV MARKETPLACE

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WIRELESS HEADSET Eartec ComSTAR

Full, duplex wireless intercom features self-contained wireless headsets that operate without belt packs or external antennas; each system is powered by rechargeable battery or AC power, and has a capacity of up to eight "all-in-one" headsets; public or private communication ranges up to 400 yards in any direction of Com-Center base, and operates FCC-license free within the UTAM-certified 1920MHz to 1930MHz band.

www.eartec.com
Booth: C8230

DIGITAL MATRIX INTERCOM INTERFACE CARD Clear-Com Eclipse MADI



Supplies up to 64 full channels of digital four-wire connectivity per card; offers full user set-up and can be configured through the Eclipse Configuration Software (ECS); routes talent and other incoming feeds across the intercom system for monitoring and insertion of IFB; offers sample frequency choices of 44.1kHz, 48kHz and 96 kHz, as well as selectable channel/port quantity of 32, 48, 56 and 64.

www.clearcom.com
Booth: C8008

INTERCOM INTERFACES Riedel Communications AVB series



Series of products includes the AVB-108 G2 Client, the Connect AVB and Connect AVBx8 panel interfaces; allow professional intercom users to connect intercom panels in IP-based LAN environments in real time; offers intercom applications over LAN infrastructures such as matrix-to-control panel connections, audio distribution, matrix-to-matrix trunking connections or distribution of digital partylines.

www.riedel.net
Booth: C4337

Lighting equipment

LIGHT FIXTURE Videssence ExceLED 25W Kit

Fixtures generate concentrated beam of light with even coverage of 3200K or 5600K; can mount in tight quarters for ENG or OB lighting; short or long throw possible depending on which spread lens is used; each kit contains six lenses and one flight case; available in 120V or 230V non-dim, and On Board dimming in 120V; fully loaded case weighs 58lb.

www.videssence.tv
Booth: C6537

Media storage, archive systems, asset management

QC SYSTEM AmberFin Unified Quality Control update

Latest version features improved user experience, new third-party plug-ins to add new levels of quality control, new integrated ingest capabilities and a streamlined workflow interface; provides unique file conversion to multiple formats; implements appropriate levels of automated and manual quality control within a unified software environment.

www.amberfin.com
Booth: SU9005

HOST BUS ADAPTER ATTO Technology Celerity FC-84EN



Leverages PCIe 2.0 interconnect and 8Gb/s Fibre Channel storage technologies; supports HD video, rich-content databases and other high-bandwidth environments; includes SFPs and three-year standard product warranty.

www.attotech.com
Booth: SL6320

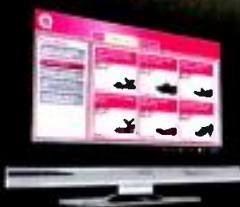
Connect with Screen at NAB

for a rapid solution to connected TV service delivery



CONNECTED TV

Screen's new solution, **ScreenConnect**, addresses the key connected TV deployment barrier - delivering services to the multitude of platforms in the market without having to redevelop for each one.



SCREEN

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www.screensystems.tv

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ARE YOU A PERFECTIONIST? If you demand the most in features and flexibility from your video system, then one of the products in the CORIOmax family is for you. CORIOmatrix goes beyond traditional matrix router functionality, by adding independent video scaling to the outputs. CORIOmaster handles switching, edge blending, video wall processing, windowing and many other functions, all in one unit. The CORIOmax product family levels the video format playing field. Take your next video system to the max - CORIOmax. Contact your TV One Sales Rep for all the answers.



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The **StreamZ Live™** family of live encoders is renowned for its superior visual quality, outstanding reliability and revenue-expanding, multi-screen output flexibility.

- Rich adaptive streaming (ABR) support and multi-screen output for devices from TVs and PCs to tablets, game consoles and mobile phones
- Superior encoding and streaming quality for engaging audience experiences
- Enterprise-class management and automation with **Digital Rapids Broadcast Manager®**

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See us at the NAB Show or visit our website to learn more:
www.digitalrapids.com/live

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Where Content Comes to Life™

See us in booth SL5624



www.digitalrapids.com

905-946-9666 x212

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AUDIO CONSOLE Wheatstone D-8



Intended for live audio mixing in medium and small market stations, remote trucks, or secondary on-air/production rooms in larger facilities; features 30 motorized faders, 24 input channels, four submasters, two main buses and two aux buses; enables surround mixing; includes extensive on-board processing; incorporates touch-screens for metering and for lesser used, set-and-forget controls; offers up to 32 channels of mix-minus/N-1 outputs, surround panning and per-channel delay.

www.wheatstone-tv.com

Booth: C2615

AUDIO CONSOLE Calrec Apollo

Ergonomic design makes two layers of channels available simultaneously, providing users more control; uses Bluefin2 high-density signal processing system; has maximum capacity of 1020 channel processing paths, 128 program busses, 96 IFB/track outputs and 48 auxiliaries.

www.calrec.com

Booth: C1746

SOFTWARE UPDATE Lawo v4.16 software

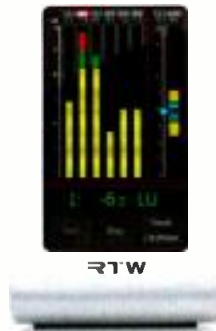


Doubles the available DSP channel count for mc2 series mixing consoles; after installation, the current DSP boards offer 96 channels instead of the 48 channels; new "broadcast channels" offer a feature set adapted specially for broadcast applications, using a simplified signal flow while maintaining sound quality.

www.lawo.de

Booth: C2046

LOUDNESS METER RTW TM3



Latest addition to the TouchMonitor range for pro-level loudness, true-peak and PPM metering for analog and digital stereo and 5.1 signals; includes the features of the larger TM7 and TM9 versions; controlled using a touch-sensitive display; instruments include single-channel and summing bar graphs, an LRA instrument and numerical displays; basic version handles analog and digital stereo audio, while the 5.1 option adds the support of six-channel digital input.

www.rtw.de

Booth: C1844

SOFTWARE UPDATE Solid State Logic V4

Software for the C100 HDS digital broadcast console offers new features and options designed to increase capability, productivity and connectivity; C-Play feature embeds a professional audio playout system into the console surface, delivering superior ergonomics for the operator and integrated recall of playlists with console projects; includes integration with Mosart Medialab newscast automation; adds existing support for Sony ELC and Ross Overdrive; full-duplex connectivity with Riedel RockNet audio networks expands compatibility with installed audio networks.

www.solidstatellogic.com

Booth: C2013

LOUDNESS METER TC Electronic LM6

Native plug-in makes the company's radar available for DAW platforms supporting audio units, RTAS or VST plug-in formats; features the company's Radar Loudness Display, showing loudness history in a single, easy-to-read, radar-like view; loudness history can be set from one minute to 24 hours; loudness history and other key information can be logged as a standard formatted text file that can be imported into a spreadsheet.

www.tcelectronic.com

Booth: C2852

AUDIO LOUDNESS METER DK-Technologies DK Meter software update

Compact Audio Loudness Meter (CALM) has been upgraded with new software (V.2011-12-06), designed to enhance the user experience and improve the meter's performance; meter is no bigger than a smartphone; comes in two versions — the stereo DK1 and the 5.1 surround sound DK2; accepts digital inputs; supplied with all known loudness measurement recommendations, as well as the standard DK-Technologies meter scales.

www.dk-technologies.com

Booth: C9942

DIGITAL AUDIO PROCESSOR Jünger Audio T*AP TV Audio Processor



Wideband eight-channel processor (8x1, 4x2 or 6+2) focuses on automatic and adaptive loudness control; handles digital inputs (AES) and, through interface slots, all other usual audio formats, including all SDI versions (SD, HD, 3G); offers dynamic equalization so that the sound can be "colored;" incorporates version 2 of the company's LEVEL MAGIC adaptive loudness algorithm, which is compliant with all current broadcast audio loudness recommendations, including ITU 1770 (versions 1 and 2), ATSC A/85, ARIB TR-B32 and EBU R128.

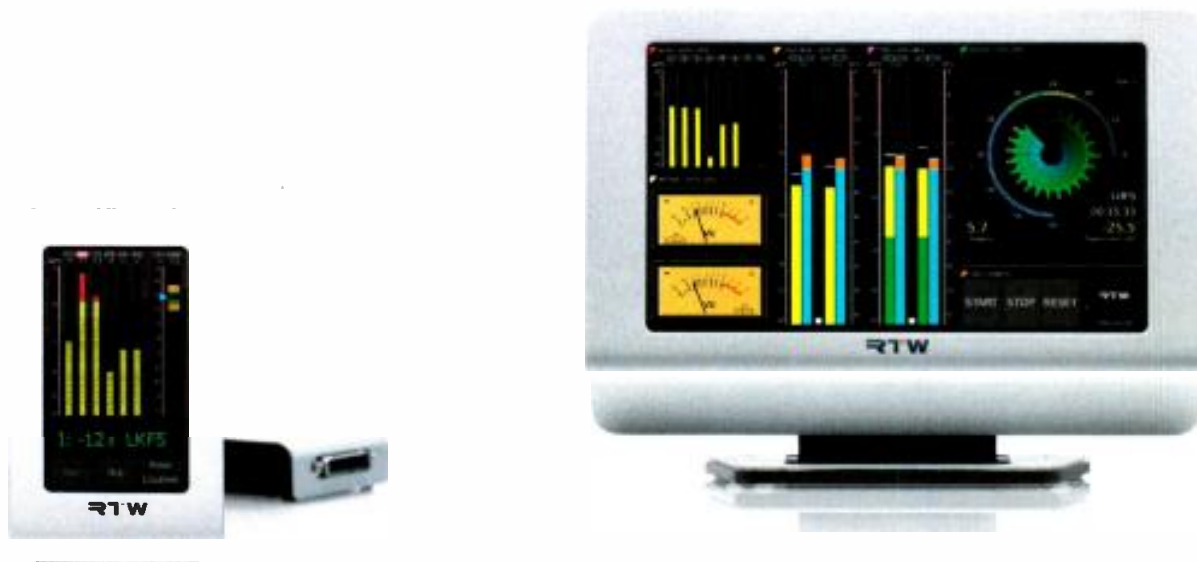
www.junger-audio.com

Booth: SU3604



www.rtw.de

Loudness Simplified



TouchMonitor TM3

TouchMonitor TM3 provides professional Loudness, True Peak and PPM metering at an affordable price with easy and flexible preset control.

- Display unit with 4.3" touch screen and flexible display layout
- Separate interface box with audio I/O, USB, GPIO
- Audio: analog bal. and unbal., S/PDIF, AES3
- ATSC A/85 Loudness and True Peak measurement
- 2-ch. stereo and 6-ch. (5.1) versions available

TouchMonitor TM9

TouchMonitor TM9 sets a new standard of professional audio metering in terms of precision, performance, efficiency and flexibility.

- 9" touch screen, easy-to-use GUI
- Highly flexible screen layout with scalable instruments
- Software licenses for flexible configuration
- ATSC A/85 Loudness and True Peak measurement
- 16-ch. audio interface options: analog, AES3, AES3id
- 3G/HD-SDI interface option available
- Ethernet/LAN, USB, VGA, GPIO ports

About RTW

Based in Cologne, Germany, RTW has more than 40 years of experience in designing and manufacturing high-quality instruments and technologies for visualizing audio signals with the most up-to-date technology.



Ask GROUP ONE Limited, our U. S. distributor about RTW's simplified Loudness measurement products. | Phone 516-249-1399 | www.g1limited.com



In Canada, ask SONOTECHNIQUE P.J.L. Inc. | Phone Montreal 514-332-6868 | Phone Toronto 416-947-9112 | Phone Vancouver 604-461-2202 | www.sonotechnique.ca

Win a TM3 at **NABSHOW** on booth C1844!
Where Content Comes to Life



Audio routing, distribution

AUDIO ROUTER Solid State Logic Alpha-Link LIVE-R



Adds a set of redundant MADI fiber-optic connections to the existing I/O unit; reduces the number of cables required for redundant fiber system installation and doubles the amount of audio signals that can be passed between the C10/C100 and the B-RIO I/O unit; features MADI I/O locked to C10 HD/C100 HDS stable clock, 24 balanced analog I/O, 12 pairs of AES digital I/O, embedded control data to simplify cabling and operation, analog I/O metering via 24 tricolor LEDs, 2RU enclosure, and redundant PSUs.

www.solidstatellogic.com
Booth: C2013

MADI ROUTER Lawo Nova29

Connects up to 16 MADI clients within a broadcast center, be it mixing consoles or external equipment; 1024 x 1024 I/O can be switched transparently; suitable for the transfer of proprietary formats, such as Dolby E; designed for use as a universal router for modern, mid-size broadcast facilities; 1RU size.

www.lawo.de
Booth: C2046

AUDIO ROUTER Calrec Hydra2 Operator (H2O)

Remote accessibility provides enhanced flexibility of the Hydra2 network router; allows user control of network independently from any console control surface including Tablets, laptops or PCs with a browser; ports can be arranged into folders for faster location; allows for central management of network synchronization; compatible with all major operating systems, including Windows, Linux and OS X.

www.calrec.com
Booth: C1746

AUDIO DISTRIBUTION AMPLIFIER Cobalt Digital 9257



Card-based system for AES10 MADI signal distribution; supports sampling frequencies up to 96kHz, with a 64-channel payload supported at industry-standard 48kHz sampling rate; also supports other sampling rates specified as valid per AES10-2003 at various payload capacities; reliably equalizes up to 250m of 1694A; features MADI audio embedder/de-embedder.

www.cobaltdigital.com
Booth: N1929

SIGNAL PROCESSOR Harman Soundweb London BLU-800



Features configurable I/O and signal processing, as well as CobraNet audio with primary and secondary ports for fault tolerance; a low-latency, fault-tolerant, 256-channel digital audio bus uses standard Cat-5e cabling to give a distance of 100m between compatible devices.

www.harmanpro.com
Booth: C2619 (Studer)

AUDIO ROUTER Riedel Communications MediorNet Compact



Provides a network bandwidth of 50Gb/s — enough capacity for bidirectional transport of 12 HD-SDI signals, dozens of MADI streams or GigE signals, and hundreds of audio channels or intercom ports; provides connectivity for four analog audio I/Os with mic preamps and a dynamic range of 117dB; additional features include an interface for Riedel RockNet digital audio networks, two DisplayPort outputs and three GigE ports.

www.riedel.net
Booth: C4337

AUDIO PROCESSING Utah Scientific Embedded Audio Signal Processing

New line of I/O boards enable embedded audio signal processing for the UTAH-400 series digital routing switchers; boards rely on field-programmable gate array (FPGA) technology; boards deserialize and decode a signal into its component data streams without compromising the router's overall operational reliability; audio channels are shuffled automatically without an outboard device or manual intervention.

www.utahscientific.com
Booth: N4511

Automation, including news and master control

VIDEO SERVER Autocue/QTV Video server



New firmware provides additional support for Avid and Apple editing workflows, with new OP-Atom and ProRes formats and improved handling of QuickTime, DNxHd and XDCAM content; provides scheduled playout of clips sequences with both local and remote access to playlists; supports 608 and 708 closed captions; transcoding can be triggered on demand from a predefined list of encode profiles.

www.autocue.com
Booth: C8525

AUTOMATED CONTENT PAYOUT PlayBox Technology AirBox MPO

Enables different video formats and different outputs to run at the same time from a single AirBox playout server; enables the running of two or more outputs so that broadcasters can easily provide parallel outputs in any combination needed to deliver the content; SDI in HD, SDI in SD (with real-time rescaling) and IP streaming is one example, or alternatively output in H.264 (MPEG-4) and MPEG-2 at the same time.

www.playbox.tv
Booth: N5834



The talk of broadcast.

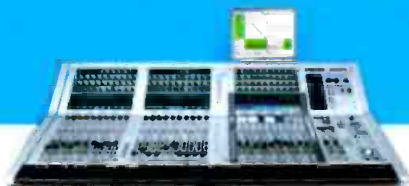
From local radio to large-scale live television productions, we provide powerful and intuitive digital mixing solutions that help to create the memorable events in broadcasting.

OnAir 1500
DIGITAL MIXING CONSOLE

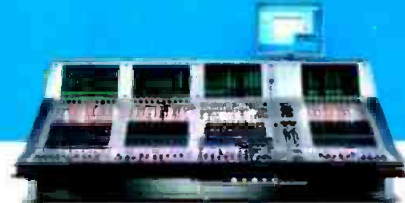
NEW



VISTA 5 M2
DIGITAL MIXING SYSTEM



VISTA 9
DIGITAL MIXING SYSTEM



More Info

Scan with your smartphone
for full details of Studer
broadcast consoles



NABSHOW
Where Content Comes to Life™

NAB BOOTH C2619

usa.studer.ch

STUDER
by HARMAN

SCHEDULING SYSTEM

MediaGeniX

WHATS'On Generation 4

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

www.mediagenix.tv

Booth: N6331

AUTOMATION SYSTEM

Myers Information Systems ProTrack TV

Comprehensive, scalable broadcast management system connects traffic, scheduling, sales, engineering and IT departments; serves as centralized unifying element within a broadcast operation; integrates seamlessly with existing infrastructure to optimize workflow and preserve existing investments.

www.myersinfosys.com

Booth: N4616

AUTOMATION SYSTEM

Miranda Technologies Enterprise Suite

Streamlines content preparation for broadcast playout and VOD publishing; enables playout operators to review, normalize and approve file-based content before it goes to air, lowering risks during playout; simplifies the normalization of program and advertising content for iTX customers, using automated workflows for analysis, review and fixing of the most important file issues; this normalization offers support for AFD tagging, high-quality up/down video conversion, audio loudness correction, channel tagging and downmixing, as well as support for closed captions/OP47 subtitles.

www.miranda.com

Booth: N2512

BRANDING, PROMO SYSTEM

Chyron Channel Box² (v4.6)



Features 2D/3D design with a complete data acquisition toolset for all branding applications; v4.6 software introduces an asset viewer that allows an operator to validate, package and query assets, as well as new data binding tools for improved panel control; additional new features include locking scenes and copy/paste/reverse functionality, all of which can be coupled with a scene list that allows groups of scenes to be created and stylized.

www.chyron.com

Booth: SL1510

SERVER CONTROL SYSTEM

HiTech Systems AViTA News



System controls video servers for clip or playlist playout; includes multiple hardware panels and software applications; interfaces via MOS to a newsroom computer system; status of each clip is fed back to the NRCS, including notifications of missing clips; allows multiple server port control from one panel; designed to interface with any video server using industry-standard professional control protocols.

www.hitechsys.com

Booth: N5020

AUTOMATION SYSTEM

NVerzion CLASS

Component Level Automation System Solutions ideal for stations with four or more channels; can be scaled up to accommodate hundreds of channels; provides system-wide control for ingest, traffic, graphics and playout; interoperable with all manufacturers and common traffic systems.

www.NVerzion.com

Booth: N4912

CHANNEL IN A BOX

Snell ICE v3.0



New features include integrated 3D graphics and CG functionality with timeline control and the ability to populate fields from Morpheus automation schedule events, as well as external data sources; a new content validation feature analyzes source material as soon as it's available to prevent invalid formats or impaired content from reaching the on-air output; integrated SAN storage brings high-performance shared storage to the platform, as well as aids in optimizing system performance and overall broadcast workflows.

www.snellgroup.com

Booth: N1820

NEWSCAST AUTOMATION

Mosart Newscast Automation 3.0

Newest version features a redesigned graphical interface with full user configurability; story elements such as cameras, clips and graphics can be assigned to buttons for quick access; range of interface overviews also can be assigned to buttons, making the GUI a shot box for touch screens; story scripts are shown directly in the Mosart GUI; operators can store clips and graphical elements in a pool ready for on-request execution.

www.mosart.no

Booth: N1820

REDUNDANT REMOTE PLOUT

PlayBox Technology EdgeBox

Provides tapeless file-based operation with two parts: one integrated with the broadcast center and the other at the remote site; at the broadcast center, it is fully integrated into the current or preferred systems, including traffic, storage, MAM, ingest, transcoding and file transfer systems; this connects to the new remote EdgeBox site's playout equipment via the Internet, providing a cost savings over dedicated fiber or satellite links.

www.playbox.tv

Booth: N5834

HD/SD 2 M/E - 3M/E Digital Video Switcher
HVS-4000HS
"HANABI"

HD/SD Frame Rate Converter
FRC-8000

HD/SD/Analog/PC Mixed High Resolution Multi Viewer
MV-3200

FOR-A ALL STARS

LTO-5 Video Archiving Recorder
LTR-100HS/120HS

VRCAM2
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Sensorless Virtual Studio System
VRCAM2

3G/HD/SD Multi Purpose Signal Processor
FA-9500

HD Variable Frame Rate Camera
VFC-7000
"Flash EYE"



Featured Product is

HD/SD 1.5 M/E Video Switcher

HVS-350HS
"1.5M/E HANABI"

HVS-350HS Main Unit



HVS-350RU
1.8 M/E Rack Size Control Panel



The New Innovations to The Video Switcher Genre

Announcing a 1.5M/E model in the FOR-A HVS-300 Series of portable video switchers noted for plentiful functions and excellent cost-performance. The HVS-350HS is the video switcher pushing functionality and operability to new heights. Like the HVS-300HS, it offers a full range of functionality.

www.for-a.com

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- China (Beijing) Tel: +86 (0)10-5170-9870

Continuous Innovation

MEDIA MANAGEMENT SYSTEM

Avid Interplay MAM 4

Designed to increase the value of media by making it easier to find, repurpose and distribute while coordinating and automating production processes; lets users interlink media operations and workflows, control movement of media between Interplay MAM and storage systems, configure metadata, and leverage an SOA structure to integrate in-house and third-party applications; key features include Interplay Common Playback Service, graphical workflow management and MAM-production integration.

www.avid.com

Booth: SU902

MEDIA PRODUCTION PLATFORM

Primestream FORK Production Suite

Able to edit and play out ingesting materials for the fast turnaround; customized metadata schemes and workflows designed for each broadcaster's workflow; export and integration tools for exchanging media and metadata with external systems and Web publishing; integrated transcoding engine with support for MXF and MOV wrappers; runs on off-the-shelf IT hardware; proxy editor with XML interchange for sharing projects with Final Cut Studio and Adobe Premiere Pro.

www.primestream.com

Booth: SL6605

CLOUD-BASED ASSET MANAGEMENT

Front Porch Digital LYNX

Manages assets on a global scale, from any device and any location; tightly integrated with the company's DIVA technology; offers rapid infrastructure deployment on demand; leverages the latest cloud and Web service technologies; underpins a range of networked and distributed systems, including a hosted disaster recovery service for existing DIVA customers and a private/hybrid cloud service allowing global media enterprises to centralize critical assets and consolidate operations.

www.fpdigital.com

Booth: N5806

MULTIMEDIA SERVER

Harmonic Omneon Spectrum

MediaCenter SSD

Features integrated storage plus Spectrum MediaPort modularity and scalability; offers a choice of solid-state drive or hard-disk drive storage; ideal for broadcasters and remote playout facilities requiring from four to 12 channels in a single video server configuration; 2RU chassis offers up to 4TB of usable storage in several SSD configurations; supports up to 12 channels at 50Mb/s, with 600Mb/s total real-time bandwidth available.



www.harmonicinc.com

Booth: SU1802

ARCHIVE SERVER

Cache-A Power-Cache

Offers a separate SSD driver for its operating system to ensure peak archiving and restore performance and reliability; offers flexibility for staging content; 1RU unit can control up to four LTO-5 drives with up to two concurrently at full speed; product is launching with latest 2.1 software release; also features a new RAID manager, SSD OS capabilities, multiple tape drive support and reporting functionality.

www.cache-a.com

Booth: SL10508

MAM CLIENT

Tedial Tarsys

Features redesigned interface; enhances operator experience and provides additional features for cataloging, editing and exporting media to third-party systems; new GUI designed to simplify collaborative work between professionals in any media enterprise.



www.tedial.com

Booth: N6506



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World-leading Audio Monitoring Solutions now available in the USA

TSL Professional Products Ltd. introduces the new Touchmix
The world's first Touchscreen-based rackmount audio monitoring solution.

NEW Audio Monitor AVM-T-MIX

AVM-T-MIX is the worlds first Touchscreen based rackmount audio monitor. Designed for use in creative operational locations throughout the TV Station or Outside Broadcast Truck; Now Producers, Directors, Editors, VT Operations, Production Assistants, Journalists and Talent have instant access to multiple audio sources at their fingertips.

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- Instant Snapshot Recall
- Snapshot 'Save and Clone' via USB Memory Device
- Audio Channel Mixing and Routing
- SDI, AES and Analog inputs
- Mono, Stereo and Multichannel Format Compatible

www.tsl.co.uk/download/AVM-T-MIX.pdf



Precision Audio Monitoring - PAM Product Family

With more than a thousand PAM units in use around the globe, the PAM 1-3G8, PAM1-3G16 and PAM2-3G16 have become the audio confidence monitor of choice for many of the worlds leading Broadcasters. Now available with a common feature set across all three models, PAM delivers both the technical analysis tools and audio fidelity required to ensure that your program content complies with local and international regulations.

- ITU-R BS1770-2 Loudness measurement as standard
- 8 or 16 Channel Bargraphs
- User Selectable Video Monitoring
- Dolby E, D and DD+ decoding option with Metadata
- Downmixing
- SDI, AES and Analog Inputs
- Multichannel Audio Outputs



Audio Monitoring, Tally Systems and Power Management solutions

All products available from stock in the USA. Email: prosales@bexel.com

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To speak to TSL direct, please contact us: Email products@tsl.co.uk Tel: +44 (0)1628 676 221



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MAM SYSTEM Dalet Enterprise Edition



Built-in production modules manage ingest, logging, production, distribution and archiving across systems and workgroups; multimedia content catalog, customizable metadata forms and enterprise search engine make content readily available; integrates easily with nonlinear editors.

www.dalet.com
Booth: SL4615

VIDEO ARCHIVE SYSTEM XenData SX-500

Scale to manage over 100TB of RAID, multiple petabytes of near-line LTO storage and an unlimited capacity of offline LTO-5 data tapes; offered in three models; each is a 2U rackmount unit that manages an LTO data tape library and RAID, providing a network file system interface; creates scalable network attached storage (NAS) device where files are written to LTO tapes and disk.

www.xendata.com
Booth: SL12513

SSD VIDEO SERVER Seachange MediaServer 1200XD



Equipped with flash memory-based drives; offers multi-resolution and multi-format operations, with a software codec configuration for SD, HD, and MXF and QuickTime interoperability; designed for channel expansion, TV broadcast, content production, live entertainment and sports applications; allows broadcasters to choose both their preferred broadcast automation system and their edit controller.

www.schange.com
Booth: N2830

ARCHIVING SYSTEM FOR-A LTR-120HS

LTO-5 tape drive (1.5TB) supports AVC-Intra 100, AVC-Intra 50, DVCPRO HD, DVCPRO 50 and DVCPRO files; designed to enable "archive at ingest" systems; records video footage as an MXF file in real time by simply pressing record and play on the front panel controls; doubles as a material/program exchange media server; features HD/SD-SDI I/O, GigE interface for file-based I/O, and RS-422 for external VTR control; 3RU half-rack chassis; built-in LCD screen for convenient monitoring.

www.for-a.com
Booth: C5219

TRANSCODING SOFTWARE Digital Rapids Transcode Manager 2.0

Provides efficient management, automation and performance for media transformation between acquisition, production, archive and distribution formats; supports multiscreen distribution opportunities with output format support for viewing platforms from mobile phones and tablets to game consoles and connected TVs; v2.0 features adaptive, logic-driven process automation with rich metadata support to reduce effort, errors and processing time; .

www.digital-rapids.com
Booth: SL5624

MEDIA SERVER EVS XT3



Features eight-channel SD/HD and six-channel 3-D/1080p configuration; offers complete media control from ingest to playout, including live editing, slow-motion replays, multichannel playback and transfer to third-party systems such as craft editors, automation, archiving or storage; supports a wide range of codecs without require hardware changes, allowing production teams to easily select different compression schemes they want to use throughout the entire edit process.

www.evs.tv
Booth: SL3815

CONTENT MANAGEMENT SYSTEM NETIA CMS

New user-friendly interface allows users to manage all processes from editing through post production and distribution through easy-to-manage workflows and task automation; GUI includes a greater number of fields that can be personalized; metadata template can be customized.

www.netia.com
Booth: SU812

SHARED PRODUCTION STORAGE EditShare XStream and Energy series



Fully integrated with EditShare Flow, Lightworks, Geevs and Ark; shared storage systems are scaled to petabytes; new features include advanced project sharing with Adobe Premiere Pro and support for FCP X; networking configurations have been enhanced to increase throughput across the EditShare tiered-storage platform.

www.editshare.com
Booth: SL9020

RECORDING TECHNOLOGY BrightTechnologies BrightClip SA



Can be incorporated into every metadata controller, ensuring the underlying storage system doesn't lose performance due to scattered file layout; eliminates disruptive and productivity-damaging factors for a studio workflow process, including high latencies, dropped frames and stuttering video.

www.4bright.com
Booth: SL8410

MEDIA MANAGEMENT

Signiant Media Manager

System-to-system solution is designed to handle the administration, control, management and execution of all system activity, including workflow modeling, from a single platform; handles batch transfers of large numbers of media files; users interact with the Manager through a Web-based interface for system configuration, task automation and reporting; agents on the sending and receiving ends monitor content movement.

www.signiant.com

Booth: SL4228

SHARED STORAGE SYSTEM

Small Tree

GraniteSTOR Titanium



Ethernet-based video-editing shared storage system features advanced file-sharing capabilities enabling real-time collaboration; configurable up to 14GbE ports or eight 10GbE ports; offers storage capacity from 16TB to 48TB; storage can be made available to users within minutes of initial start-up; can be managed from anywhere with an Internet connection using a Web-based browser.

www.Small-Tree.com

Booth: SL7425

MEDIA ASSET MANAGEMENT SYSTEM

Front Porch Digital DIVAdirector v5.0



Enables operators to search, locate and retrieve stored media assets directly from their desktops using their Web browsers; enhancements include HTTP-based adaptive streaming support, whereby client Internet browsers can seamlessly and dynamically switch between different video and audio bit rates depending on available network conditions and CPU power; enables portability across operating systems (Windows 7 and Mac OS), browsers (Internet Explorer, Safari, Chrome and Firefox), proxy formats (WMV and H.264), and an increased number of concurrent users.

www.fpdigital.com

Booth: N5806

INGEST SYSTEM

Harmonic ProMedia Capture



Enables real-time ingest of live and tape-based HD/SD video for file-based production and multiscreen workflows; captures files at the highest resolution directly into the formats needed for production or for distribution to multiple screens; provides time-savings in workflows that require real-time ingest from multiple sources such as video mastering, repurposing, archiving and video-on-demand workflows.

www.harmonicinc.com

Booth: SU1802

ARCHIVE SYSTEM

SGL FlashNet

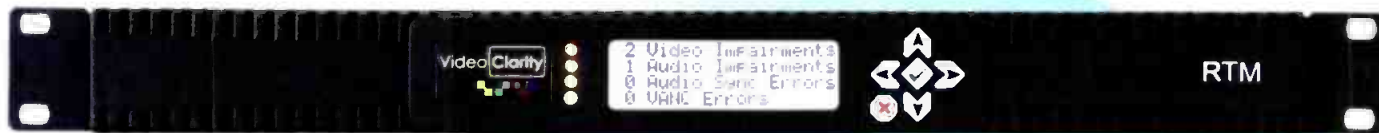
Adds support for writing AS02-wrapped files (part of the MXF standard) to LTFS tape; provides instant content portability between systems and streamlines file-based workflows; AS02 files written to LTFS tape allow the simple transportation of primary video/audio content and the related metadata; can now receive AS02 content directly that has previously not been held in the archive; adds Web-based interface for managing content held within archive.

www.sglbroadcast.com

Booth: N1520

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New IP Monitoring for OTT Quality Testing



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SERVER

Sonnet Technologies Xmac mini server



1U rackmount PCIe 2.0 expansion system with two Thunderbolt ports mounts a Mac mini inside an enclosure; contains two x16 (x4 mode) PCIe 2.0 slots, a 150W power supply and installed GigE card; enables users to plug in to PCIe 2.0 adapter cards (one half-length, one full-length) to slots connected to the Mac mini via locking Thunderbolt cables.

www.sonnettech.com

Booth: SL8713

**New media,
streaming products,
multimedia/Internet**

TS-OVER-IP SWITCH

T-VIPS TNS544

Provides intelligent redundancy switch-over between MPEG transport streams delivered over IP networks; continuously monitors all inputs, switching seamlessly to the backup stream if errors are detected, or services or components are lost; allows network operators to monitor and handle multiple transport streams and configure multiple switches.

www.t-vips.com

Booth: SU7907

MULTICAMERA STREAMING VIDEO SYSTEM

EVS Sports360° CCast



Allows instant distribution of multiple camera angles on Web-connected screens during live productions; suitable for any sport; with fully modular and service-oriented architecture, the system offers integration with third-party Web systems and data import such as statistics, commercials and tweets.

www.evs.tv

Booth: SL3815

CDN MANAGEMENT SYSTEM

Broadpeak OperatorCDN

Based on the company's BkM100 Mediator CDN management platform, which provides an advanced statistics display tool that references all the sessions per content, per region and per format; system enables network service providers to manage a CDN on their own networks; also features live and on-demand applications and support for Microsoft Smooth Streaming, Apple HTTP Live Streaming, Windows Media streaming, and Adobe Flash RTMP formats.

www.broadpeak.tv

Booth: SU8012

ENCODER

Harris Selenio

New networking features include a 10-bit contribution encoder and the new MDX2 multiplexer module; MDX2 allows DVB-T2 broadcasters to connect gateway functionality to the output of eight-channel multiplexer, which creates completely integrated DVB-T2 gateway that can support up to eight physical layer pipes and T2MI stream creation for local, regional and national DVB-T2 broadcasting.

www.broadcast.harris.com

Booth: N2502, N3400

ENCODER

Digital Rapids StreamZ Live Broadcast



Carrier-grade hybrid live encoder combines multiscreen output versatility with robust features for broadcast, cable, telco and satellite television operations; features simultaneous H.264 or MPEG-2 encoding for traditional television applications and multiformat encoding, including ABR streaming for "any-screen" delivery to devices such as mobile phones, tablets, PCs, IPTV, OTT services and more.

www.digital-rapids.com

Booth: SL5624

SERVER

Wowza Media Server 3

Latest edition makes formerly hard-to-implement features such as adaptive bitrate streaming, time-shifted playback and integrated rights management simple and cost-effective; supports multiple studio-approved DRM platforms; has unconstrained per-server capacity with no CPU core limitations; has capability of any-screen, time-shifted delivery of live streams with Wowza nDVR AddOn.

www.wowza.com

Booth: SU9702

STREAMING VIDEO SYSTEM

DVEO MultiStreamer IP/IP Brutus



Real-time, multichannel streamer can sit in the cloud as a cloud encoder; supports HTTP adaptive smooth, live and dynamic flash streaming protocol for output to mobile devices; input or output format can be MPEG-2 or H.264; capable of near real-time FTP output of segmented TS streams with I-Frame boundaries; supports M3u8 playlist files (standalone and through HTTP live); transcodes up to 12 720p HD streams, six 1080i/p HD streams or 20 SD streams from MPEG-2 to H.264 in each module.

www.dveo.com

Booth: SU2114

CLOUD-BASED ENG SYSTEM

TVU Networks TVUPack Cloud

Enables production crews to broadcast live in SD or HD to any size Web audience without the need of traditional receiving infrastructure; is a cost-effective cloud-based alternative to traditional satellite or microwave broadcasting hardware that enables broadcaster to bring live broadcast content to TV stations or Web audience with minimum infrastructure investment.

www.tvupack.com

Booth: SU8519

PORTABLE LIVE PRODUCTION SYSTEM

NewTek Tricaster 850 EXTREME

Can record up to eight channels of live video regardless of input or output; records multiple formats, including QuickTime, H.264, AVI and MPEG-2, with adjustable audio headroom; delivers video in up to 1080p; can stream live to the Internet and other digital media in up to 720p; also has ability to deliver wireless with Apple AirPlay support for iPad, iPod and iPhone.

www.newtek.com

Booth: SL5111

TRANSCODER

Haivision KulaByte Internet Transcoder 4.0



Delivers multiple-bit-rate HLS and RTMP streams for streaming; supported by Linux; is available as an on-site appliance or as a cloud-based system; allows content to be streamed from on-site to the cloud with efficiency and uses computing power and bandwidth available directly within the cloud; offers highest quality per bit (QP/B) streaming, maximizing video quality over restricted networks.

www.haivision.com

Booth: SL9911

Production switchers, video effects, keyers

SWITCHER

Grass Valley Kayenne Video Production Center

Fully digital 10-bit 4:2:2 switcher with up to 96 inputs and 48 outputs; ranges from 1.5 to 4.5 M/Es; each full-function keyer has two pages of video and key storage to free up Image Store outputs; integrated macro editor allows users to edit online or offline on a PC running Kayenne menu application; any partition can be placed into layered mode, providing composited video and key outputs.

www.grassvalley.com

Booth: SL106

MEDIA AND LOGO INSERTER SOFTWARE

Evertz OvertureRT LIVE

Includes an HD/SD multi-input switching device, internal H.264/MPEG-2 video playback server, advance branding capabilities and DVE effects; designed for cost-effective multichannel payout with integrated master control and advanced channel-branding features; offers 1TB of local storage for storing video and real-time graphics branding content; all Evertz Logo-enabled keyer products ship with the software suite.

www.evertz.com

Booth: N1502

HD/SD SWITCHER

Panasonic AW-HS50

Half-rack width, multiformat live HD/SD switcher offers 10-bit processing, four HD/SD-SDI inputs and one HD DVI-D input, as well as a built-in multiviewer, chroma keyer, aux bus and 1080/29.94PsF support; designed for such applications as mobile production, AV facilities and event video; also offers an IP link to the new AW-RP50 remote camera controller, enabling remote switching of the remote-controlled camera video.

www.panasonic.com/professional

Booth: C3607

VIDEO CREATION SOFTWARE

Broadcast Pix Video Control Center 3.0

For the Granite and Mica Video Control Centers; features optimized production control on a touch-screen, voice-automation control of switching and graphics, customizable virtual sets and automated dual-channel graphics that include Daktronics scoreboard integration; enables eight cameras to have virtual backgrounds, plus three key layers on top for picture-in-picture, titles and animated logos; built-in image editor can crop and blur an image to simulate depth of field.

www.broadcastpix.com

Booth: SL6424

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PRODUCTION SWITCHER

Snell Kahuna 360 Compact



Offers the same functionality as the full-size Kahuna 360, including seven keys per M/E, resource sharing with Make M/E technology, and FormatFusion3 which allows for any format in and any format out; 6U chassis gives users the ability to support SD, HD and 1080p (single link) functionality for a cost-effective migration from HD to 1080p; ideal for trucks and studio-based productions; designed to be easy to deploy.

www.snellgroup.com

Booth: N1820

Recording media

RECORDER

Blackmagic Design HyperDeck Shuttle

blackmagic_HyperDeckShuttle_0223
Features Avid DNxHD record and playback; when using HyperDeck 2.5 software, adds option to record and playback DNxHD QuickTime as well as DNxHD MXF format files; recognizes professional camera start/stop flag embeds within their SDI video output to record in sync with the camera.

www.blackmagic-design.com

Booth: SL220

DIGITAL VIDEO RECORDER

Cinedeck RX v3.1

Rack-mountable, multichannel, solid-state recording, monitoring and playback system, for broadcasters and mobile OB; v3.1 supports record/playback of footage from popular Sony and Panasonic HD cameras; records and outputs in the native format of each camera (Sony XDCam 50 and XDCam EX 35, and Panasonic AVC-Intra class 50 and 100), or to a range of Avid and Apple editorial standards — including Avid DNxHD (wrapped as MXF OP-Atom or QuickTime), JFIF for proxies, and all Apple ProRes codec formats.

www.cinedeck.com

Booth: SL13417

DIGITAL VIDEO RECORDER

Fast Forward Video sideKick HD



Camera-mountable recording solution records at 220Mb/s, providing higher image quality; straight-to-edit DVR records to off-the-shelf, removable 2.5in SSD drives in native ProRes (for Apple Final Cut Pro) or DNxHD (Avid) NLE formats; bringing files into NLE environment means moving the disk from the SideKick to the computer.

www.ffv.com

Booth: C6313

PORTABLE DIGITAL RECORDER

Sound Devices PIX 240 v2.0

Enables users to monitor images in varying exposures through exposure assist, a feature that allows for false-color and zebra-stripes viewing; equipped with focus assist, which includes a peaking filter and one-to-one pixel zoom; features SD recording (NTSC and PAL) and support for using simultaneous analog and SDI/HDMI audio inputs.

www.sounddevices.com

Booth: C2546



Video converters with scalers
Video and USB extenders
MPEG-4 AVC encoder

Seneca

Powerful products to facilitate your monitoring needs.

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RECORDING SOFTWARE

Blackmagic Design HyperDeck 2.5 public beta

New update adds embedded timecode support, DNxHD recording to QuickTime and SDI camera record triggering to HyperDeck SSD recorders; is compatible with Mac OS X and Windows; timecode can be preserved from incoming video stream based on the standard RP-188 HD protocol and playback recorded files with the original timecode information; update also includes a new rolling timecode record trigger feature; any device that outputs RP-188 timecode can be used to start and stop HyperDeck Shuttle recording.

www.blackmagic-design.com

Booth: SL220

DIGITAL RECORDERS

AJA Video Systems v3.0 firmware for Ki Pro, Ki Pro Mini



Can now be configured for data transfer to FireWire 800-equipped Apple computers; allows transfer of files through standard Ethernet networking for both units; both units can now burn timecode and transport state into the video signal, providing at-a-glance status to users monitoring output; enables HDMI timecode support in Ki Pro Mini for Sony NEX-FS100 and other Sony NXCAM cameras; Ki Pro now supports ExpressCard/34 (34mm wide) memory cards (not ExpressCard/54); adds 1080 variable frame rate support for certain Canon camcorders; adds an option for continued recording upon video input loss.

www.aja.com

Booth: SL3305

Satellite equipment, services

SNG NETWORK

Inmarsat BGAN X-Stream

Offers guaranteed, on-demand streaming data rates from a minimum of 384kb/s up to approximately 450kb/s; no external antenna or additional hardware required; higher bandwidth allows camera operators to pan in for close-ups and pan out for panoramic views, or capture the action as it unfolds behind the reporter, giving viewers an enriched experience.

www.inmarsat.com

Booth: SU10009

ON-DEMAND BANDWIDTH SERVICE

On Call Communications QuickSPOT

Uses both completely automated mobile satellite antennas or fixed antennas; gives clients access to dedicated satellite space, available on-demand and from any location in the continental United States; no minimum usage commitments are required, and offers unlimited space usage; operates on Intelsat's Horizons I and Horizons II Ku-band satellites.

www.occsat.com

Booth: OE910

RECEIVER/DECODER

Sencore MRD 5800



Designed to support today's highest quality contribution video feeds; provides H.264, 4:2:2 and 10-bit decoding; support for up to eight audio PIDs gives operators the flexibility to tackle all of their multilingual, multichannel and multiformat delivery challenges; decodes and outputs full HD 1080p60 video.

www.sencore.com

Booth: SU3612

RIEDEL

MediorNet Compact

50G Real-Time Media Network

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NAB
Central Hall
Booth C4337



- Synchronized 50G real-time network for 3G/HD/SD-SDI video, audio, data & intercom at the price of multiplexing point-to-point fiber products
- Flexible signal routing incl. point-to-multipoint
- Integrated Frame Store Synchronizer, Embedder/De-Embedder, Test Pattern Generator, On-Screen Display & Timecode Insertion at every port
- Fully compatible with Artist Digital Matrix Intercoms, RockNet Digital Audio Networks and modular MediorNet systems

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Studio and support products, multi-image displays

MULTIVIEWER

Apantac LE-32 HD

Features 32 auto-detect HD/SD-SDI/composite inputs (3G ready); has single-frame processing delay; each input can hold up to four channels of discrete audio (optional); supports full 10-bit HDMI 1.3 outputs; has built-in CATx extenders allowing 1080p (DVI/HDMI) up to 115ft with optional active receivers; field upgradable to allow discrete audio; designed with front panel buttons for quick preset recalls.

www.apantac.com

Booth: N4806

VIDEO SERVER SUPPORT

Harris NEXIO Studio Suite

Aids in the transition to tapeless studio production and more efficient, file-based workflows; designed for live, multicamera studio productions such as news and magazine formats, entertainment and reality TV shows; offers familiar videotape recorder functionality while adding operational benefits of multichannel, nonlinear video servers; provides users of Harris Velocity ESX or Apple Final Cut Pro editors with instant access to content.

www.broadcast.harris.com

Booth: N2502, N3400

MULTIVIEWER

Miranda Technologies Kaleido-XQUAD



Quad-split multiviewer for truck and studio monitoring; offers tally support via direct serial interface; uses a 1RU, half 19in frame chassis; available with four 3Gb/s HD inputs and a single multiviewer output or eight 3Gb/s HD inputs and two multiviewer outputs.

www.miranda.com

Booth: N2512

EQUIPMENT MANAGEMENT SYSTEM

Obor Digital Zeus Broadcast

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

www.zeusbroadcast.com

Booth: N1202

MULTIVIEWER

FOR-A MV-42HS

Supports up to four asynchronous or mixed HD-SDI and SD-SDI inputs, including 1080i, 1080p and 720p sources at a variety of frame rates; half-rack size and simple user interface make it ideal for OB trucks and master control facilities; offers high-resolution HD-SDI and DVI-D output as either a full-screen picture or four-image split view; has an auto resize engine for SD input.

www.for-a.com

Booth: C5219

KVM EXTENDER

Matrox Avio



Allows users in graphics-intensive design, visual effects and editing applications to separate the computer from the working environment and place it in a secure, climate-controlled machine room; transmitter and receiver pair captures dual digital video, keyboard, mouse, analog stereo audio and USB from the host system and extends them uncompressed up to 1.24mi. over a single fiber-optic cable.

www.matrox.com

Booth: SL5115

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The new **GuideBuilder Mobile** builds on the ease of use and flexibility of the GuideBuilder platform, the broadcast industry's clear choice for metadata and schedule generation for more than ten years.

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DIGITAL

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INSTANT REPLAY SYSTEM

Telestream Pipeline Replay



Multichannel video player combines with video capture system to provide instant capture and display of 18 HD 720p camera feeds; acquires multiple camera feeds in Apple ProRes 720p, as well as other HD and SD formats; video feeds are delivered to shared storage, where they are available for immediate playback, editing during capture or transcoding to other file formats.

www.telestream.net

Booth: SL1405

TECHNICAL FURNITURE

TBC Consoles SmartTrac V2



Provides the ability to gang individual workstation components together to form complete master control and production control consoles; other features include optional electric height adjustment, multi-tiered monitor beam systems, a newly designed cable core with front access, power management, extended monitor Trac, and all new legs and feet.

www.tbconsoles.com

Booth: C6516

LCD PRODUCTION MONITORS

JVC DT-X71 series



Ideal for field and studio applications; 7in AC/DC monitors offer 1024 x 600 resolution with a 16-degree viewing angle; can display 480i, 480p, 720p, 1080i and 1080p video signals at a variety of frame rates; series consists of three models; DT-X71C offers one HDMI and one composite video input, while the DT-X71H adds two HD/SD-SDI inputs and an HD/SD-SDI loop through output; DT-X71F (shown here) includes an additional HD/SD-SDI loop through output and one HDMI converted to SDI output.

pro.jvc.com

Booth: C4314

VIDEO PROCESSING SYSTEM

TV One C3-540

CORIOmaster



Designed to offer a more efficient approach to building video systems; uses the company's latest CORIO3 technology to give users access to new levels of video processing power; combines edge blending, video wall processing, multiviewing, windowing, image warping and video processing with up/down/crossconversion in a 4RU device; features a built-in modular video matrix using CORIO softswitch, which provides a firmware-based video routing, switching and video conversion and effects platform using multiple canvases and layouts, along with PC- and Apple-compatible control software.

www.tvone.com

Booth: C5647

STUDIO CONTROL

OradTD Control

Allows users to select different video box compositions with a click of a button on their video switchers; technical director control is based on a touch-screen user interface that resides in the switcher; allows technical directors to select the different video box compositions and assign different video sources to each of the video boxes; this enables tasks that could not have been achieved before, such as switching on-air from six video sources to completely different video sources with one click of a button.

www.orad.tv

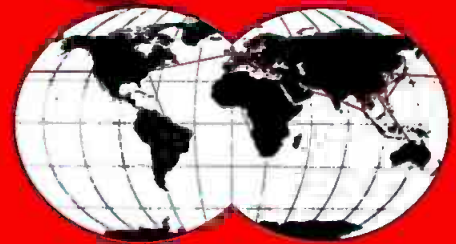
Booth: SL4524

RIEDEL

RiLink

Global Fiber Service

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Booth C4337



The alternative to satellite uplinks: RiLink is the new way to broadcast live signals from remote event locations or foreign studios to the home facility. Bi-directional, unaffected by weather conditions and with significantly shorter latency. Based on Riedel's own global backbone, the RiLink Global Fiber Service transports not only HD/SD-SDI video signals but provides additional features like integrated intercom and telephone communication, secure connections to corporate networks or access to digital archives. RiLink is charged at a flat rate allowing for precise budget planning and more live pre and post-event features or news reports at no extra costs.

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MULTIVIEWER

Miranda Technologies Kaleido-Solo

Compact, standalone 3Gb/s HD/SD-SDI video-to-HDMI converter allows low-cost LCD displays to be used for monitoring; brings together multiple QC tools in a tiny form factor, including loudness metering, level meters, aspect ratio markers, AFD metadata, time code and video monitoring; provides two audio connectors to output S/PDIF and analog stereo of a 5.1 downmix, or any audio pair; provides automatic video input format detection; supports a wide variety of video resolutions, including 525i, 625i, 720p, 1080i and 1080p; provides CC 608/708 and Teletext/OP47 support.

www.miranda.com

Booth: N2512

TALLY SYSTEM

TSL TallyMan Virtual Panel

Designed to simplify control of multiple router I/Os with an easy-to-use user interface; software-based control platform removes the need to install individual hardware panels each time a router is added, expanded or upgraded; able to interface with a variety of third-party routers, vision mixers and multiviewers; straightforward to install for existing TallyMan users; can be switched on and off remotely.

www.tsl.co.uk/products

Booth: N1119

**TBCs, frame syncs,
conversion
equipment**

HDMI-TO-SDI CONVERTER LYNX Technik CHD 1812



Features a built-in frame sync; supports SD/HD/3G-SDI formats, as well as 3-D; a flexible reference input allows the unit to be cross-locked between formats; allows facilities to convert HDMI to HD or SD-SDI, such as sources coming from broadcast video cameras, as well as PC and MAC computers.

www.lynx-technik.com

Booth: N4433

HD-SDI SCAN CONVERTER

Matrox Convert DVI Plus



Allows broadcasters to take computer-based content to air easily and economically; creates broadcast-quality video from computer applications such as Skype, YouTube and Google Earth, as well as video games and Web browser sessions; can also be used to drive projectors and large displays at live events.

www.matrox.com

Booth: SL5115

SIGNAL CONVERTERS

Avitech International Seneca-C SHS and HSS

Convert signal sources from 3G/HD/SD-SDI/CVBS to HDMI/DVI; feature a compact, standalone converter with scaler; provide automatic video input format detection and OSD, which includes audio metering, video source labels and video safe area graticule; HSS model converts signal sources from HDMI/DVI/VGA/SDI/CVBS to SDI; are ideal for production, mobile trucks, post production and television broadcast.

www.avitechvideo.com

Booth: SL8915

The multi-platform world revolves around metadata management



Traffic and scheduling connected full-circle with sales, engineering, IT, and accounting — it's a whole new world for efficient workflow. Integrate your existing systems to finally get a handle on the business end of end-to-end.

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PROTRACK 

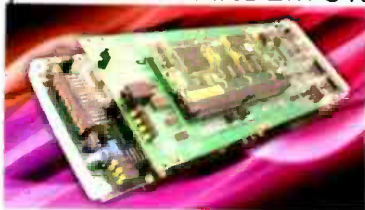
PROTRACK 

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MyersInformationSystems 

EMBEDDER

Crystal Vision TANDEM 310



Combined embedder/de-embedder for 3G, HD and SD sources has the ability to handle mixture of up to eight AES and analog audio channels simultaneously; can embed up to four groups of external audio by fitting up to two audio piggybacks to the main board; adjustable audio delay of up to 80ms can be used to compensate for any delay between incoming video and audio signals caused by processing.

www.crystalvision.tv

Booth: N1815

MULTICHANNEL AES SWITCH/CONVERTER

Digital Alert Systems R198

For facilities looking to upgrade their existing analog EAS systems to operate in a multichannel AES digital audio world; makes it easy to convert any unbalanced stereo audio signal and present it as the common "B side" of four independent A/B (2x1) balanced AES audio channels; uses synchronous electronic switching for glitch-free performance with no pops or clicks; each AES channel ensures seamless program switching of any AES audio stream.

www.digitalalertsystems.com

Booth: C3346

SIGNAL CONVERTER

Matrox MC-100



Allows users to manage SDI signals within their environments, whether for monitoring, distributing, switching, multiplexing or converging 3D; supports a wide range of display resolutions through 3G, Dual Link, HD and SD-SDI; can be used as an HD-SDI switcher, a distribution amplifier, a multiplexer and a 3D processing unit.

www.matrox.com

Booth: SL5115

TBC AND FRAME SYNC

Ensemble Designs BrightEye 1

Equipped with analog component, analog composite S-Video (Y/C) and SDI video inputs, can take on any video source; built-in TBC/frame sync provides steady output even with marginal inputs; front panel controls select input source, format and adjust video gain; simultaneous SD SDI (electrical) and optical outputs are provided; both color bars and SD SDI checkfield (pathological) test patterns are included to facilitate transmission path testing.

www.ensembledesigns.com

Booth: N2524

SIGNAL PROCESSING PLATFORM

Snell KudosPro



Performs 3Gb/s, HD and SD standards conversion (frame rate conversion), as well as up/down/crossconversion; supports a range of audio options, including Dolby E, closed captions, time code and AFD, as well as management and monitoring via SNMP or Snell's RollCall system; platform offers a cost-effective range of converters to suit all applications — international program exchange; content repurposing for Internet, TV and Blu-ray distribution — and high-density teleport and satellite distribution.

www.snellgroup.com

Booth: N1820

Telco, IPTV and mobile video equipment

VIDEO COMPRESSION SOFTWARE

Broadcast International CodecSys

Patented software cuts bandwidth requirements more than 30 percent over satellite, cable, IP and wireless networks to enable a new generation of cost-effective rich-media applications; software-based encoder/transcoder for live, file-based, cloud video content and assets offers an open framework and robust set of APIs to allow seamless integration with core video management systems across the video distribution network.

www.brin.com

Booth: SU8523

Connect AVB

Intercom goes

Real-Time Ethernet

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Connecting intercom panels over an Ethernet-based LAN environment has been the dream of many system planers. Riedel's AVB product line provides a communication solution fulfilling the demands of professional intercom users. Based on official IEEE next generation Ethernet standards AVB makes it possible to utilize facility and enterprise LAN data infrastructures for real-time intercom applications. This allows for new approaches in system and facility design providing significant savings in infrastructure investments.

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COFDM HD TRANSMITTER Broadcast Microwave Services NT5723SDHD



Features include low power consumption, one-frame latency (end to end) and a frequency range of 5.725GHz to 5.850GHz; 1920 x 1080i (HD); Part 15 license free (U.S.); measures 3.35in x 1.19in x 5.6in (without brackets); weighs 1lb (0.45kg).

www.bms-inc.com

Booth: C9545

VIDEO RF LINK IMT RF Central microLite HD Elite



Compact MPEG-4 COFDM digital transmitter can deliver up to 200mW from a package of less than 6cu in; features superb H.264 HD and SD encoding capabilities while operating in the standard 2k DVB-T COFDM mode; H.264 video encoder supports main profile of the H.264 standard, providing a 30 percent bit-rate reduction or video quality improvement compared to H.264 baseline profile; receiver and transmitter are available in the 5.8GHz unlicensed or 2GHz licensed bands.

www.imt-broadcast.com

Booth: C6423

CELLULAR VIDEO UPLINK

AviWest DMNG Pro

Bonds up to 10 cellular connections (eight 3G/4G-LTE internal modems with high-efficiency custom antennas array and two USB interfaces for additional USB modems) plus a Wi-Fi connection; features an integrated H.264 video encoder; streams live HD video to receiver with sub-second delay; weighs less than 2.2lb; connects to cameras via SD/HD-SDI, analog or HDMI; unit configures itself automatically based on real-time network capability; touchscreen interface; can be controlled by receiver (DMNG Studio) or any device connected to the unit through the network.

www.aviwest.com

Booth: SU4707

FIBER NETWORK

Intelsat Video Fiber Network

Built for broadcasters to provide full flexibility and options for both SD and HD transmission; ideal for unidirectional, long-haul intercity transport of sports, entertainment and news events; 100-percent fiber network uses latest MPEG-2 compression encoding with data rates ranging from 4Mb/s up to 80Mb/s; end-to-end signal is always first generation.

www.intelsat.com

Booth: SU4919

VIDEO CAPTURE AND TRANSMISSION BACKPACK

TVU Networks TVUPack



Portable, lightweight video capture and transmission backpack enables broadcasters to deliver live news and events to audiences with a professional-quality picture; rather than relying on traditional satellite and microwave remote broadcast products, the unit broadcasts live video in HD or SD using multiple 3G/4G/WiFi/WiMax connections; enables broadcasters to cover live breaking news from locations that are costly or difficult to reach with traditional methods.

www.tvupack.com

Booth: SU8519

it's the Camera Control System that controls expenses.

Our Coax/Fiber Link transmits power with full CCU functionality... up to 3000' using standard field repairable coax and Neutrik optical CON DUO Cable. And for distances less than 500', you can just use two coax cables. The Coax/Fiber link controls expenses... and increases reliability... replacing heavy camera batteries, local power supplies, expensive cables and connectors.



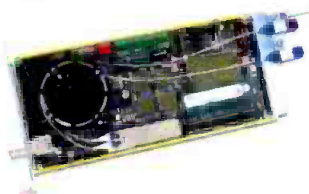
Telemetrics Inc

CAMERA CONTROL SYSTEMS

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VIDEO COMPRESSOR

Nevion Ventura VS901-IED-GEP



JPEG 2000 system provides mathematically lossless compression for HD-SDI transport supporting bit rates up to 800Mb/s; using JPEG 2000 lossless filters, it can now achieve mathematically lossless compression with some video content; with highly complex content, significant gains in video quality have been attained; even with highly complex content, the use of lossless filters results in up to 10dB of PSNR increase over the use of lossy filters at intermediate bit rates.

www.nevion.com

Booth: SU2019

CELLULAR VIDEO UPLINK BACKPACK

LiveU LU60

Bonded 3G/4G LTE backpack with proprietary RF technology for superior resiliency; transmits up to 1080 HD video with sub-second latency; capable of up to 14 cellular connections; includes IFB (return audio channel from studio); capable of store and forward modes; integrates with all industry-standard power supply systems, including Anton Bauer, IDX and Sony V-Mount.

www.liveu.tv

Booth: SU9119

TRANSCODER

Sencore TXS

Product line has been updated with features such as audio transcoding and PIP (small format video) generation; provides multiple channels of transcoding or transrating in a 1RU chassis; transcodes video services from an MPEG transport stream to or from MPEG-2 or H.264 and can format convert from HD to SD; newest version also supports audio format conversion between common formats, including Dolby Digital and Digital Plus, MPEG-2, HE-AAC and AAC-LC, and linear PCM.

www.sencore.com

Booth: SU3612

CONTRIBUTION PLATFORM

Thomson Video Networks ViBE CP6000



Multiformat, high-performance platform for contribution of live video; offers modular implementation of the optimal MPEG-4 contribution codecs and eight HD channels per 1RU chassis; MPEG-4 and MPEG-2 codecs can be enabled as required with software licensing; high-density support simplifies the infrastructure and saves energy costs; its support for XMS control and telecom transmission streamlines large deployments.

www.thomson-networks.com

Booth: SU3012

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hear (and you like the FCC not
hearing from them).

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www.LinearAcoustic.com

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FIBER-OPTIC TRANSPORT SYSTEM

Telecast Fiber Systems Thunder

Fiber optic audio, intercom and data transport system uses just one or two strands of fiber and 1RU of space; transports up to 80 bi-directional channels of audio, data and/or intercom signals; configurable in up to 10 eight-channel blocks; can be equipped with a portable, throwdown "Stage Box" offering 32 analog inputs, eight analog outputs and two intercom channels in a hardened, ruggedized enclosure.

www.telecast-fiber.com

Booth: C8925

PORTABLE LIVE VIDEO TRANSMISSION SYSTEM

TVU Networks TVUPack Mini

Ultra-small, lightweight camera-mountable portable live video transmission system uses one or more wireless data cards to broadcast live events from virtually any location direct-to-Web with HD or SD broadcast quality; its lightweight design and small form factor gives broadcasters, production crews, news agencies and independent videographers a professional-quality tool to capture live video and broadcast high-quality images directly to the Web.

www.tvupack.com

Booth: SU8519

WIRELESS TRANSMITTER

VidOvation In-Net GoalCam



Transports uncompressed HD video wirelessly using 60GHz RF technology with no bit or resolution manipulation; incorporates the RF transmitter and camera in a ruggedized housing, which includes an extruded aluminum tube with Lexan shock-resistant domes on each end, mounted on a quick-release, adjustable positive registration bracket; internal Li-Ion batteries support up to five hours of operation per charge.

www.vidovation.com

Booth: SU11012

Test & measurement equipment

AV QUALITY MONITOR

Video Clarity RTM

Measures audio and video quality and delay, as well as VANC data lines integrity; alarms and records the AV sequences if any of these levels have fallen below a degradation threshold that can be pre-configured by the engineering team; detects fine detail issues such as blur and blockiness; includes reference test patterns.

www.videoclarity.com

Booth: SU11302

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2012 DTV MARKETPLACE

HD/SD SDI PATTERN GENERATORS ESE DV-229, DV-230



DV-229 offers two identical outputs, while the DV-230 provides four identical outputs plus a genlock input, all of which are located on rear-panel BNC connectors; front-panel LCD and push buttons allow for quick and easy setup; alternatively, a software control panel and USB port may be used to configure the units; color bars as well as many other patterns are provided; supports NTSC and PAL, in addition to DVITC/RP-188; also offer closed caption insertion, embedded audio tones and onscreen time code/user text insertion.

www.es-web.com

Booth: C6437

MPEG VIDEO MONITOR Wohler Technologies DVM-2443



Four-screen monitoring system offers advanced test and measurement features in a stand-alone 2RU configuration; incorporates four 4.3in 16:9 ratio LED backlit displays for at-a-glance monitoring of program content from MPEG-2/4 ASI streams, as well as PID table metadata, waveform and vectorscope overlays, and audio-level meters; accepts two 3G/HD/SD-SDI loop-through inputs, as well as composite video, component video, DVI-I and analog stereo inputs.

www.wohler.com

Booth: N5211

TS ANALYZER Triveni Digital StreamScope MT-40 4.7

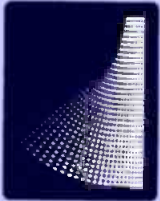


New version offers integrated real-time, mobile-DTV-analysis capabilities; allows users to verify ATSC, MPEG, A-78, SCTE, DVB-SI, ISDB, and ATSC M/H standards and protocols; enables monitoring of mobile video frame timing and structure, parade and ensemble usage, required SCC tables, and ESG data from one GUI; ongoing software updates are provided.

www.trivenidigital.com

Booth: SU5202

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N4806



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DISTRIBUTION AMPLIFIER

ESE ES-210

Quad 1 x 6 1MHz/5MHz/10MHz distribution amplifier provides four independent 1 x 6 frequency DAs in a single rack-mount enclosure; each DA has loop-through inputs and six isolated outputs, which are all accessible via BNC connectors; uses screwdriver-adjustable gain controls that are located on the front panel; the gain controls provide an overall signal level adjustment of -1.5db to +3.4db.

www.es-web.com

Booth: C6437

MEDIA MONITORING PROBE

Bridge Technologies VB330



Based on the company's new 10GB architecture; able to deliver 60GB monitoring capability in high-density applications at points of maximum data throughput in today's 10GB core networks; offers telcos, network operators and digital media organizations a scalable monitoring solution.

www.bridgetech.tv

Booth: SU9819

MULTICHANNEL DECODER

Evertz 3480 Media eXchange Platform

Combines six PRO MPEG-2 decoders in 1RU; designed for monitoring applications or pro signal contribution; capable of reconstructing in the most flexible way all VANC and HANC data in the SDI/HD-SDI outputs; other options include 4:2:2 video decode, Dolby AC-3 decode, audio-video monitoring and audio-video level adjustment; controlled by the VistaLINK PRO.

www.evertz.com

Booth: N1502

IP TRANSPORT STREAM MONITOR

Rohde & Schwarz R&S DVMS-B40 IP option

New option for the R&S DVMS family of compact monitoring systems is designed to help network operators achieve maximum operational reliability when feeding transport streams over IP networks; depending on the model, up to four signals can be measured simultaneously; monitors all relevant quality parameters in the IP transmission; if one of the transmitted transport streams is faulty, the new option can extract this stream and transmit it to the central monitoring station, also over IP.

www.rohde-schwarz.com

Booth: SU3407

VIEWER SOFTWARE

Harris QuiC

Software family minimizes the workload for video server operators through easy-to-use tools designed to analyze ingested files; offers scalability to enterprise-levels; ideal for use after content editing, during automated ingest and on-the-fly video transcoding; features ready-to-go test templates and an intuitive Web-based user interface; provides easy integration into workflow solutions featuring NEXIO AMP servers, Invenio, digital asset management software and other third-party workflow systems.

www.broadcast.harris.com

Booth: N2502, N3400

QUALITY CONTROL

PlayBox Technology QCBox

Provides automatic monitoring of media files; delivers verification of whether legal and technical obligations are met; analyzes the relevant media files in a playlist, folder or selected files; basic tests include checking for correct duration of streams, continuity, and frozen and black frames; also performs audio tests, including loudness, phase and audio level measurements; test results are stored in a metadata file that accompanies the media file and prior to the program playout on AirBox.

www.playbox.tv

Booth: N5834



Multiviewers with integrated mouse and keyboard control.



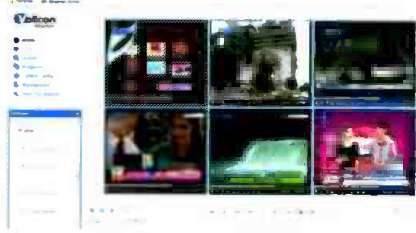
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MPEG TS LOGGING AND MONITORING

Volicon Observer TS 7.0



Enhanced version of the Observer TS accommodates an even broader array of inputs, including ASI, QAM, 8-VSB and DVB-T MPEG TS interfaces; additional enhancements include improved system density for HD and SD programs, and simpler ease-of-user interfaces; system allows users to record (log) MPEG transport streams continuously and monitor the A/V content, including BS.1770-2 loudness, NAVE and other correlations of data and video; also allows users to remotely stream and export content to all stakeholders in the media enterprise.

www.volicon.com

Booth: SU5715

TEST PATTERN GENERATOR

Apantac HDMI Test Pattern Generator

Supports 48 possible output resolutions (up to UXGA/1080p); operates up to eight hours on portable, rechargeable batteries; releases KHz tone (at 4 KHz); features 34 different patterns; LCD display with buttons; automatic power-off is enabled while in battery mode; includes 12 VDV power supply and HDMI cable.

www.apantac.com

Booth: N4806

OSCILLOSCOPE

Tektronix MDO4000

One of the first oscilloscopes that allows users to capture time-correlated analog, digital and RF signals for a complete system view of their devices; features a built-in spectrum analyzer; allows users to view both time and frequency domains in one glance and view the RF spectrum at any point in time to see how it changes with time or device state.

www.tektronix.com

Booth: N1023

PORTABLE BROADCAST TESTER

Video Clarity Clearview Shuttle

Includes a 1080i broadcast-quality AV analyzer that comes pre-loaded with Video Quality Experts Group (VQEP) and EBU video test sequences; also features a multiformat file decoder, perceptual audio and video metrics (JND and difference mean opinion score) and objective audio and video metrics (PSNR and amplitude/frequency), and side-by-side viewing modes; GUI-controlled or command line scriptable with examples for python, perl, etc.

www.videoclarity.com

Booth: SU11302

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| Matrix | 4 inputs, 4 outputs |
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| Standards | SMPTE 259M(C), 292M, 424M |
| Input cable length, m | 270 Mbps – 400, 1.475 Gbps – 200, 2.97 Gbps – 110. |
| Ethernet | 10/100Base-T(X), HTTP/Telnet |
| Serial | RS-422/485, 9600-N-8-1 |
| Dimensions | 10.0 (W) x 1.72 (H) x 4.4 (L) in |
| Power | 8 W (5 V DC) |

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VIDEO TESTER

Rohde & Schwarz R&S VTE

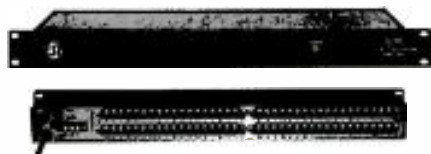
Universal platform for testing video and audio interfaces on consumer electronics equipment during development and quality assurance; modular platform accommodates up to three test modules and can be equipped with additional software options to optimally suit the requirements of specific applications; features source, sink and dongle testing on MHL 1.2 interfaces; real-time difference picture analysis for testing video transmissions over LTE; localized touchscreen user interface; integrated test automation and report generation.

www.rohde-schwarz.com

Booth: SU3407

ISOLATION/DISTRIBUTION AMPLIFIERS

ESE ES-250, ES-251



Units are designed to improve the distribution capabilities of RS-232C or provide isolation between users of RS-232C; three 1 x 8 amplifier circuits allow the incoming signal to be distributed via 24 outputs; units receive RS-232C and buffer the signal so that each of the 24 outputs can drive a single user at a distance of up to 50ft (per output); all inputs and outputs for the ES-250 (shown here) are via rear-mounted terminal block connectors; inputs and outputs for the ES-251 are via rear-mounted 9-pin D-sub connectors.

www.esweb.com

Booth: C6437

16-CHANNEL SDI AUDIO MONITOR

Wohler Technologies

AMP1-16M

Dual-input SDI unit de-embeds and provides metering and monitoring of any or all of the 16 audio channels in the selected 3G/HD or SD-SDI stream; offers intuitive operation and clear display of levels and other critical information using bright 2.4in LED-backlit LCD displays, enabling one-touch monitoring and summing of any selected pair(s) via built-in speakers, headphones or XLR balanced outputs; features include remote access for setup and storage of user-defined presets via Ethernet and USB connections, gain adjustment/trim on individual audio channels and pass-through of both SDI inputs.

www.wohler.com

Booth: N5211

**TV transmitters,
feedline, antennas,
towers, services**

TRANSMITTER

Larcan Cool-Dock

Features "Cool-Dock" technology, which means no coolant disconnect is required for servicing; available in power levels from 1.5kW and up; 10kW transmitter is available in a single cabinet; uses ASI or SMPTE310M interface; runs at 19.39MHz bit rate; dimensions are 78in x 27in x 42in.

www.larcan.com

Booth: SU1619

ANTENNA

Jampro Antennas JAT-U



Broadband batwing IV/V 470MHz to 860MHz antenna; radome-enclosed unit can be either top- or side-mounted on a tower; minimum windloading while providing broadband response makes it ideal for applications where either one channel is defined or multiple channels are combined.

www.jampro.com

Booth: C2307

500W TRANSMITTER

Linear Industries

AT71-500-11

4RU x 19in x 26in drawer size reduces installation footprint; nine temperature controlled cooling fans provide optimal performance and longer life for critical components; features include scheduler software to run corrections/measurements at scheduled times, internal GPS receiver, selectable timebase reference and proprietary bandwidth reduction technology; operates in VHF and UHF.

www.linear-tv.com

Booth: SU7219

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www.aviwest.com

DTV EXCITER

Thomson Broadcast ATSC-8000

Available in a 1RU platform; supports VHF or UHF operation; allows broadcasters to transmit both fixed ATSC (A/53) and ATSC-M/H (A/153), delivering mobile DTV services to viewers; also available with optional A/110:2011 configuration; features Digital Adaptive Pre-correction, providing pinpoint correction of both linear and nonlinear distortions; additional features include an internal GPS receiver, dual transport stream inputs, front-panel MMI for user configuration and a built-in Web GUI for remote access.

www.thomson-broadcast.com

Booth: SU3012

ANTENNAS

Viking Satcom VS-180NAV, VS-240NAV



Feature a dual-axis motorized Az/El navigator mount, as well as 1.8m and 2.4m reflector options; capable of inclined-orbit tracking; offer motorized C-band and Ku-band feed options.

www.vikingsatcom.com

Booth: OE3013

Video editing systems

I/O DEVICE

AJA Video Systems Io XT



Supports capture, playback of 4:2:2 and 4:4:4 HD and SD formats, and can unify disparate formats via 10-bit real-time up/down/crossconversion; provides compatibility with most popular NLE programs, newest codecs, video formats and stereoscopic 3-D workflows; includes dual Thunderbolt ports; two 3G/HD/SD-SDI inputs and outputs; single-link SDI 4:2:2 support, single- and dual-link SDI 4:4:4 support; HDMI input and output (including support for 3-D).

www.aja.com

Booth: SL3305

MEDIA PRODUCTION SUITE

Adobe Creative Suite 5.5

New version includes the Production Premium package, which serves many mobile TV production needs; offers updated version of the Premiere CS editor, which features a merge clips command for mixing audio from different cameras shot in the field and support for RED and Canon/Nikon DSLRs; also includes an update of After Effects CS, which features stereoscopic 3-D workflow; additional features include new effects such as Camera Lens Blur and an advanced warp stabilizer.

www.adobe.com

Booth: SL2624

VIDEO EDITOR

Bitcentral Create

Browser-based system has no installed applications; is a timeline-based editor with two independent audio channels; users can manage, log/screen and edit live sources in real-time; story video can be saved directly to its position in a news rundown; collaborative project workflow enables easy video and note sharing; certified with Adobe Premiere Pro and Grass Valley Edius workflows; multiple, simultaneous, live H.264 streams provide proxy preview on all desktops.

www.bitcentral.com

Booth: SL2405

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MULTIFORMAT NONLINEAR EDITING SOFTWARE

Grass Valley EDIUS 6

Comes with support for new proxy-based workflow and MXF formats to servers and file-based devices such as P2/SDCAM/GF and Canon XF; includes 10-bit editing support, 2K/4K support, free shape mask filter and 16-camera multicam editing; is WYSIWYG, seeing the full image preview while preserving original image quality, with no loss of resolution or frame rate; enables real-time playback of three or more streams without special hardware.

www.grassvalley.com

Booth: SL106

NEWS EDITOR

EVS Xedio

Offers journalists an integrated, file-based toolset for immediate news field editing operations; allows them to review, select, log and edit media recorded on ENG solid-state camcorders; Xedio's virtual media processing engine offers instant media reviewing and operations without cumbersome physical file transfers.

www.evs.tv

Booth: SL3815

NLE

Sony Creative Software Vegas Pro 11

Features GPU-accelerated video processing using OpenCL compatible hardware, improving timeline playback performance and render times; adds New Titles & Text plug-in; "per-parameter" keyframing for many video plug-ins; adds Floating Windows masking tool in the Stereoscopic 3D Adjust plug-in, to compensate for screen-edge violations; supports NVIDIA 3D Vision on single-display systems; adds support for RED EPIC clips.

www.sonycreative.com

Booth: C11001

INGEST TOOL

Adobe Prelude

Ingests and logs video; facilitates easy addition of metadata during import; enables rough cuts before sending footage to craft editor; works directly off media; can perform proxy generation during import; builds simple cuts-only timelines; exports directly to Premiere Pro or Final Cut Pro 7 XML.

www.adobe.com

Booth: SL2624

Video routing

ROUTER

Ensemble Designs Avenue Signal Integration System

For use in master control bypass, QC monitoring, off-site news bureaus, mobile trucks and helicopters; has exclusive real-time video thumbnail display for every SDI source and destination in the router; clean and quiet switch option has full-frame sync; control choices include router control panel, Web browser and Avenue router iPad app; serial protocols via TCP/IP, RS-232 and SNMP; supports HD, SD, 3G, ASI and 310M signals.

www.ensembledesigns.com

Booth: N2524

SIGNAL MODULE

Utah Scientific FLEX I/O

UTAH-400 routers and UTAH-100/XFD fiber distribution frames are now available with the FLEX I/O signal module; users can now easily configure systems to implement coax and fiber I/Os on a port-by-port basis; provides enhanced ability to customize use of signals according to an application's specific needs; for the UTAH-400 router, option consists of input/output cards that carry eight or 12 signals and updated rear-panel assemblies to provide converter block access.

www.utahscientific.com

Booth: N4511

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AMP1-16M 16 Channel Audio Monitor With Trim



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VIDEO ROUTER Axon SynCross



Synapse-based modular video routing system capable of switching 3Gb/s, HD and SD-SDI signals; also can switch compressed domain signals such as ASI/DVB and SSI/SMPTE-310; able to populate Synapse frames from one slot with eight inputs and outputs — up to five slots for a 40 x 40 routing system; can be expanded both in electrical or fiber or a mix; can be controlled over the Ethernet, Cortex control panels or Cortex; ACP and an Ethernet port are available for control with automation systems.

www.axon.tv

Booth: N4624

ROUTER CONTROL SOFTWARE PESA Catrax Web



Uses a Web browser to monitor and control routers in locations around the world; ASP.net application runs inside most popular Web browsers; compatible with the full line of PESA routers and switchers from 8 x 8 to 1024 x 1024; Web-enabled server PC and an Ethernet port connection to a PESA PERC2000 control system required; supports up to 10 simultaneous clients with license packs available to expand in groups of 25 or 50 users.

www.pesa.com

Booth: SL9615

ENCODER Screen Service Broadcasting ENC 334

Provides up to four SD channel encoding capacity; creates new line-ups or transcodes existing analog channel line-ups to digital for either DVB-T, DVB-S, IPTV or cable delivery; also provides stereo audio encoding in MPEG-1, Layer II (MP3) and AAC (HE and LC) formats for each video channel; elementary streams are multiplexed in MPEG-2 transport stream for output over an ASI link; separate ASI input provides support for an external PSIP/SI table data generator.

www.screen.it

Booth: SU4306

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calrec.com



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Screen Service Broadcasting ENC 333

High-definition system encodes multiple HD and SD formats; H.264 and MPEG-2 video encoding technique guarantees low output bit rate with flexible ranges from 2Mb/s to 25Mb/s; audio stream is coded using MPEG-1 Layer II, AAC-HE and AAC-LC, or Dolby Digital Pro; A/V elementary streams multiplexed in an MPEG-2 transport stream for output over an ASI link; next to PAT and PMT, PSIP support includes MGT, TVCT and CVCT; while SI support includes NIT, SDT, CAT and TDT.

www.screen.it

Booth: SU4306

CONTROL PANELS

Utah Scientific UCP-LP

Family of menu-based router control panels feature high-resolution, full-color LCD displays and buttons to provide user-friendly operation for increasingly complex routing systems; panels offer 16 or 32 buttons in a compact 1RU package, as well as an innovative 3RU panel with dual-touch-screen LCD displays; all of the new panels are based on a completely new, user-definable menu system that provides a completely open platform for defining all panel functions on a panel-by-panel basis.

www.utahscientific.com

Booth: N4511

Weather/data services

WEATHER PRESENTATION TOOL

Weather Central Fusion Studio



Designed to bring weather presentation to life with graphics created in a 3D environment, featuring multiple light sources, shadows, customizable animations and transitions, and 3D object support; Magic-TRAK interactivity allows meteorologists to deliver a nonlinear presentation and improves workflow with an easy-to-create, renderless presentation; integrated social media functionality ensures a consistent, dynamic weather presentation.

www.wxc.com

Booth: SL3911

Wire, cable, connectors

CABLE REELS

Hannay Reels AV Series

Constructed of rugged steel with a non-reflective matte finish; feature welded channels for stacking that promotes maximum transport and storage efficiency; direct rewind allows for easy set up and teardown; removable side-mounted connector panel allows for complete customization of XLR and BNC connector patterns; adjustable friction brake prevents cable overrun and damage during operations.

www.hannay.com

Booth: C4939

DIN CONNECTORS

White Sands Engineering 1023

One-piece 1.0/2.3 DIN connectors available for 1855A, 1505A, 1694A; and 179DT cables; easy install for wiring Miranda, Evertz and other router equipment; features one-piece design for fast, reliable assembly with no parts to lose.; includes female 1.0/2.3 connectors for 1855A type cable and female feed-through panel mount connectors.

www.whitesandsengineering.com

Booth: SU7315

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NABSHOW

N1929

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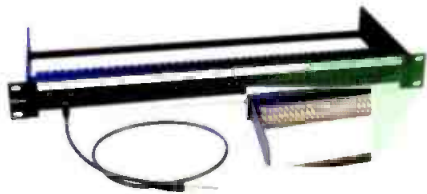
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PATCHBAY

Bittree Micro-Video Patchbay



Provides a 2 x 48 format in either a 1RU or 1.5RU size; ideal for use in mobile production, OB vans and any other video application in which space and weight are at a premium; supports 3Gb/s and 3-D productions, HD/SDI, SD/SDI, AES and high-resolution computer graphics; features a rear lacing bar and DIN 1.0/2.3 rear terminations; unique design offers the ability to recess the front panel to prevent cord protrusion.

www.bittree.com

Booth: SU6519

FIBER-OPTIC CONNECTOR

Optical Cable Corporation MHC II



Mini hermaphroditic fiber-optic/hybrid connector is designed to inter-connect fiber-optic channels in a small, yet effective, package; uses a bayonet-style, mechanical coupling interface to easily mate to receptacles by a simple twisting motion; provides flexibility by allowing many combinations of fiber-optic termini and electrical contacts to coexist within the same hermaphroditic connector system; available in 2-, 4-, 6- and 8-CH versions.

www.occfiber.com

Booth: C10345

CABLE AND ACCESSORIES

Markertek featured products



Several new interface solutions will be presented for the Red One, Epic and Scarlet digital cinema world, including Laird precision cables; will also feature Delvacam HD loop-thru HDMI monitors, new MADI interface technology and extended height production trailers.

www.markertek.com

Booth: C5334

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Integrated playout workflow



A simplified workflow enables broadcasters to focus on branding VOD.

BY STEPHANE BLONDIN

Over the last several years, the broadcast industry has made a concerted effort to simplify the content playout workflow with better integrated systems. Using what has become commonly known as IT-based playout, or “channel-in-a-box”

systems, many in the community have become comfortable with managing even complex, multichannel playout scenarios that include rich graphics, multiple audio tracks, and a mixture of live and recorded content. The development of advanced automation technology for content

playout, switching, signal processing and graphics has greatly simplified the back end of the playout workflow.

Although use of advanced automation removes much of the complexity from the back end of the playout, a long list of concerns must still be addressed. This is particularly true in the front end of the workflow. Here, a large number of file formats, codecs and content contribution methods, as well as the need to prepare files for multiple types of nonlinear (VOD) content consumption, continue to create major challenges. Engineers now must shift their focus to upstream processes in order to ensure efficiency across the complex workflow

Advanced automation technology for content playout has greatly simplified the back end of the playout workflow.

Advanced automation technology can streamline playout and allow broadcasters to focus more of their resources on developing nonlinear branding and capturing incremental revenues.

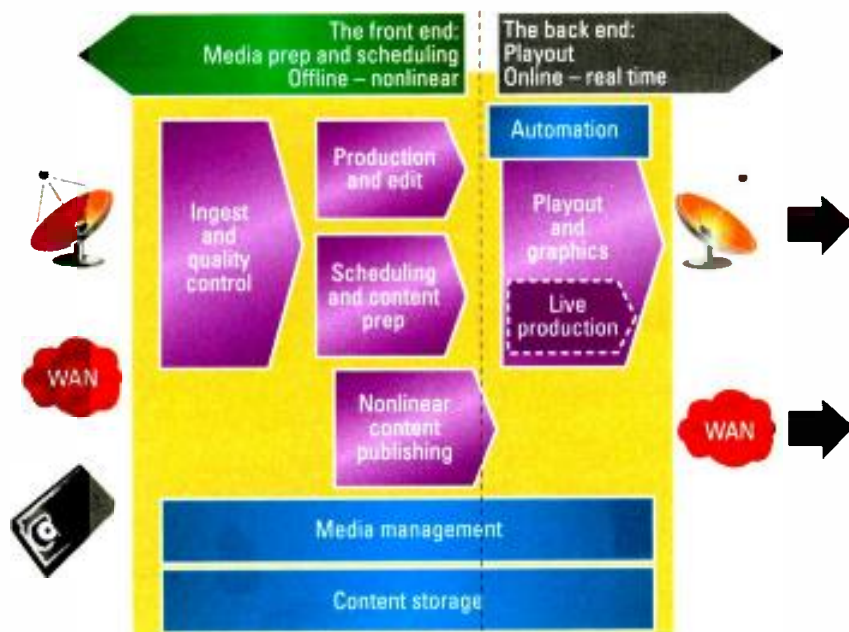


Figure 1. The back-end playout processes have been streamlined substantially, and this is turning attention to the front-end content reception and preparation processes.

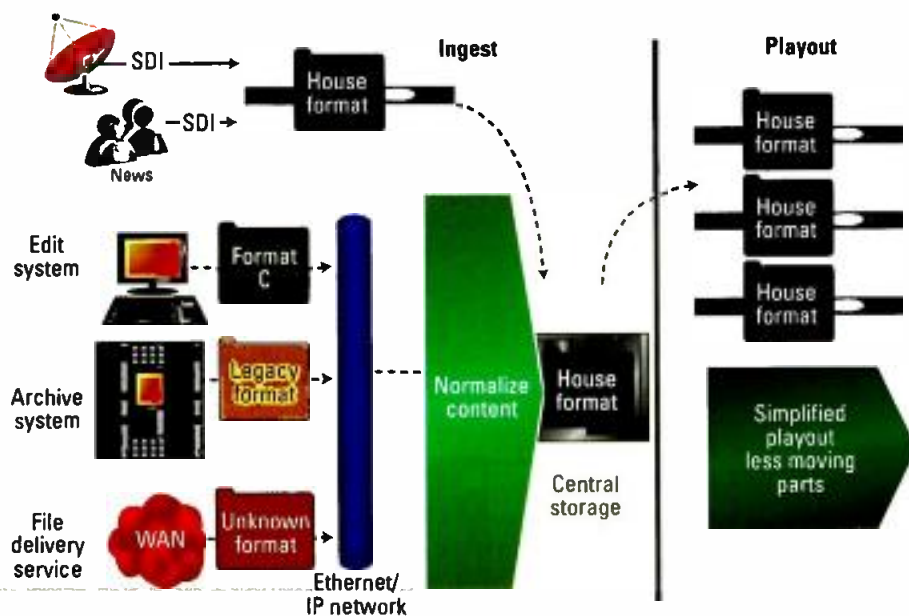


Figure 2. Content normalization works for files received from known and unknown senders.

that drives content to an ever-growing number of edge devices. These front-end processes represent a huge undertaking for broadcasters today, and they consume a growing percentage of a facility's available resources — often without providing additional revenues. (See Figure 1.)

The increased complexity in content ingest and preparation, combined

with the growth in the demand for nonlinear content, represents a key opportunity for broadcasters — to simplify and automate portions of the workflow to stay ahead of the curve, while remaining lean. A new generation of tools can help broadcasters manage this situation to stay efficient and remain ready to scale as the complexity continues to increase.

Managing all the file formats

Today, nearly all content arrives at a typical broadcast facility in files, and broadcasters need to manage dozens of formats, including multiple codecs and file wrapper formats. All this content needs to be ingested, checked and normalized to match the broadcaster's specific standard and to ensure that all the appropriate information and metadata is present. From there, it has been customary to perform many of the routine signal processing tasks in real time, during playout, such as correcting aspect-ratio errors and avoiding excessive loudness.

As more and more content has been added to the mix, however, this live process has become increasingly more complex to manage and therefore more risky. Using file-based processing, offline, during the front end of the workflow (i.e., before live playout) minimizes the risk and greatly simplifies the workflow. Processing incoming content in this way enables faster-than-real-time monitoring of content, reducing resources necessary for QC and improving overall QoS.

A big key to the success of a file-based system is creating an effective content normalization process to quickly ascertain necessary information about content that is entering the workflow, from both known and

Any "wild" files must go through a careful file-assessment process before entering the facility workflow.

unfamiliar sources. For example, files created internally or received via a station's parent network will typically demand a different processing requirement to those received from one of the many file delivery services, such as Pathfire. Any "wild" files must go through a careful file-assessment

process before entering the facility workflow. (See Figure 2.) This can be performed efficiently by checking key parameters such as loudness, format and audio configuration to determine the types of processing required to bring the file into the desired format and then automatically transferring this requirement to the processing grid. This file-based normalization process can improve profitability by lowering operating costs. It can also eliminate concerns over errors that are not spotted until they go to air.

Nonlinear content handling

The need to deliver content to the ever-increasing range of VOD, catch-up and OTT television services stretches the bandwidth of broadcasters, who often do not even have the luxury of incremental revenues to offset the additional costs. This makes production of these nonlinear

services a huge drain on resources for many broadcasters.

It has become the norm for nonlinear content workflows to operate almost fully independently from the traditional content workflow. This approach worked for a time, but the recent growth in the number of platforms and content that needs to be managed to compete in the nonlinear world has made an independent workflow scenario a nightmare to maintain. VOD programming is no longer something that is just nice to have. It is critical that broadcasters provide this type of value-added service to maintain viewership and compete against the long list of available alternates and Internet-enabled services. The complexity of generating all the necessary multi-platform content — not to mention managing multiple languages, captioning requirements and other issues — have left some broadcasters

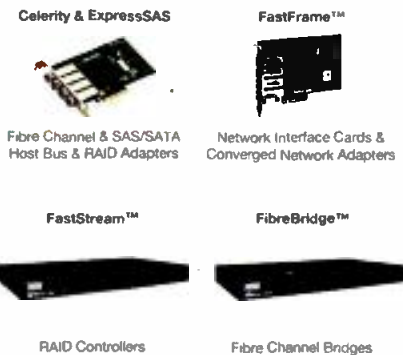
with inefficient workflows containing an awkward mixture of automated and manual processes.

The fact that most of the content prepared for VOD does not generate large revenues has been a big issue, for obvious reasons. However, some broadcasters are able to capture revenues thanks to ratings services that are now tied to viewership of recorded content. For example, Nielsen C3 enables broadcasters to earn credit for a spot that is viewed as part of recorded content up to three days after the programming was viewed initially. The C7 format goes even further, enabling the broadcaster to substitute different ads from four to seven days after the original broadcast to create additional revenues. This sort of revenue opportunity is a benefit for broadcasters and provides significant incentive to tie the preparation of nonlinear content to the



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traditional playout process. Using a single, unified system to manage the preparation and playout of all multi-platform content results in not only more efficient operations but also in incremental revenues.

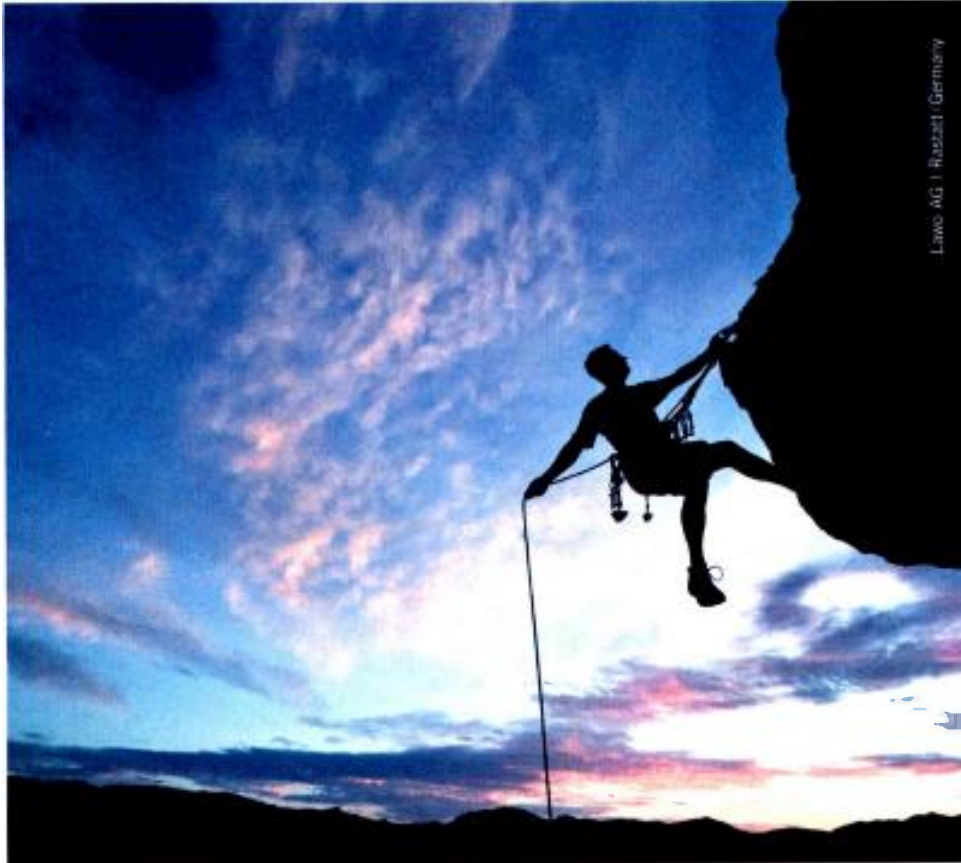
VOD branding

Another challenge of managing the

wide range of nonlinear content has been effectively branding the content and using graphics for time-sensitive promotions. Broadcasters are just as eager to brand this material as their live programming to promote viewer loyalty and drive eyes to new programming. The obvious problem, though, is that VOD content is not consumed

at a specific time — so tried-and-true tactics such as “up-next” promos are basically worthless. Because broadcasters have tried to be as efficient as possible in processing VOD content, they have often avoided the additional workflow steps required to create separate branding schemes for the nonlinear content, choosing instead to post this content with little, if any, branding. This obviously leaves opportunities on the table.

By using automated VOD mastering and cross-platform branding, this vexing problem is relatively easy to address. A VOD content-preparation system, with tight integration between linear and on-demand content preparation, can improve the flexibility and speed of the production, minimize costs, and enable new capabilities. (See Figure 3.) When a broadcast operation can share content and



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Networking Audio Systems



A smarter process also avoids unnecessary duplication of effort, such as transcoding the same content multiple times.

processes across all workflows, it gains full visibility across the organization of schedule requirements. This means that VOD promo graphics can reference schedule information, such as when new episodes play on the linear channel each week. A smarter process also avoids unnecessary duplication of effort, such as transcoding the same content multiple times.

By using the most modern VOD content generation techniques, broadcasters can satisfy all their needs without taking on additional manpower costs. The technology exists to provide integrated support for cross-platform preparation and branding

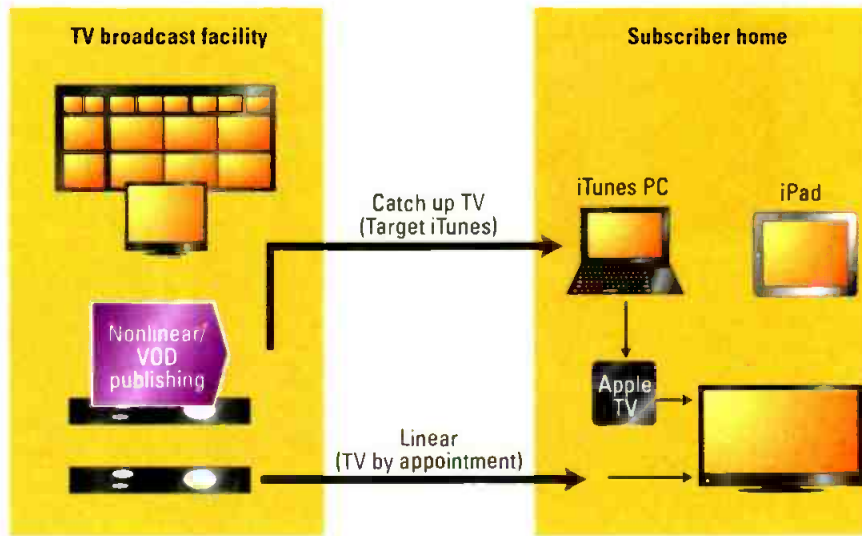


Figure 3. Automated mastering of VOD content, driven by the linear television playlist, creates a much more scalable television model.

that can handle even the most complex requirements, such as closed captioning, Nielsen watermarking, AFD and V-chip metadata. Support

for BXF to enable smooth integration with traffic systems is also available, as is integration with asset management systems that grab content from

generic storage, servers, editing systems and other potential locations.

Integrated workflow

Broadcasters face many challenges when determining the best ways to manage the huge array of content they now are tasked with preparing and providing to viewers. The challenge of managing a completely separate workflow to process nonlinear content does not have to be one of them. By using unified, automated content preparation for linear and VOD content, a broadcaster can operate a playout workflow that is better suited for present needs — and for the future. With no end in sight to the need to keep doing more to attract viewers, creating an integrated playout workflow that incorporates nonlinear content delivery represents a smart decision. **BE**

Stephane Blondin is senior product manager at Miranda Technologies.

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BUILDING an IP-based facility

Find out how to merge IP technology with traditional SDI technology in today's fast-paced environments.

BY GARY OLSON

There are changes in the design and planning of a broadcast and production facility for IP- and file-based production and distribution technologies. Whether it is a new build or renovating an operating one, the new design considerations and changes are in both bricks and mortar (physical) and technology. And while the IP-based broadcast environment is IT-centric, the design and planning is different for the media-centric IP facilities in comparison to a conventional datacenter.

Of course, it's always better if you happen to be building a new facility. In an upgrade or renovation to an existing facility, there are usually restrictions and limitations based on legacy technologies, infrastructure, architecture and mechanical systems.

Core systems

There is a common core of technology systems and technical operations areas in all broadcast and production facilities that moving to an IP infrastructure does not change. The production, broadcast and technical

operations systems and infrastructure are core systems, including creation, acquisition, craft production and distribution. (See Figure 1.)

Prior to an integrated IP environment, many business operations that operated in silos with limited integration are now closely tied together. These include traffic, scheduling, library management, finance, legal and business intelligence.

In the transition to IP, all of these areas now tightly integrate, and where the IT department historically only supported business operations, they

now play a significant role in the IP-based media world.

In planning the IP infrastructure, there is cross over and integration to business IT systems. The IP media infrastructure has different demands and is bandwidth-intensive. While business and media networks require integration, care must be taken to keep these systems separate with tightly managed integration points. When upgrading an existing facility, there are additional considerations to maintain connections to legacy systems and how to integrate IP-based technology and operations.

Let's look at the changes in the core systems. The evolution from analog to HD/SD-SDI did not require as significant a change in the technology infrastructure that the transition to IP demands. HD/SD-SDI technology (wideband) uses a similar topology for video, audio, communication and

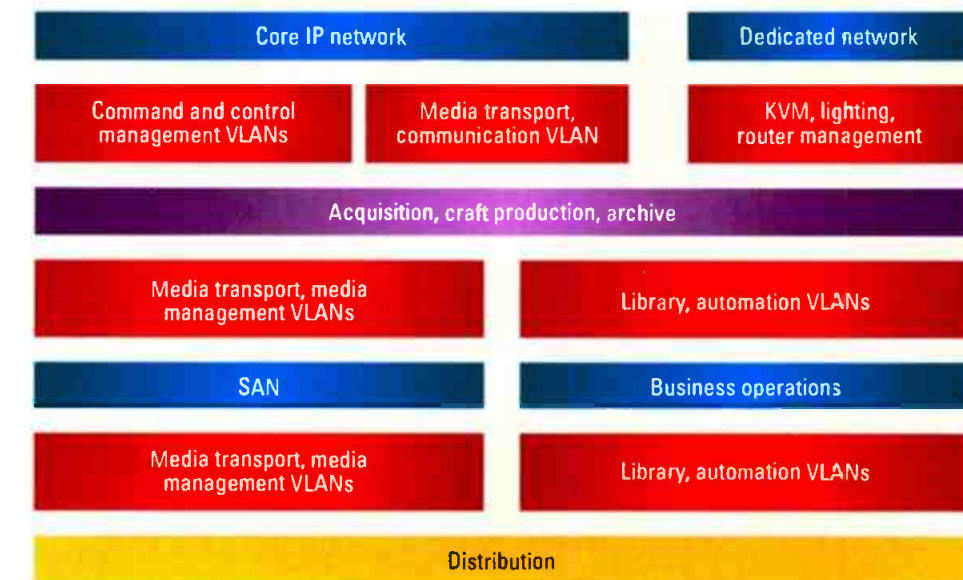


Figure 1. Shown here is a typical network architecture with core systems, including creation, acquisition, craft production and distribution.

control as analog did. There are separate signal paths, each with their own requirements for routing, distribution and equalization.

IP has changed all that. Each of these

different signal types is now IP-based. Media is in streams or file-based, communication is VoIP, control is IP, and integration to business systems in the enterprise is all IP. While these

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Figure 2. Shown here is an IP- and file-based architecture.

processes have become IP-based, HD/SD-SDI and AES are still a critical part of real-time production for switching and mixing. The design considerations

for IP begin in planning content creation systems and will impact all technical areas as media moves through the infrastructure from acquisition to

craft production, distribution and archive. (See Figure 2.)

The technology infrastructure for the IP workflow is made up of multi-layered and multi-tiered networks. Even the HD/SD-SDI infrastructure is managed and controlled using an IP layer. The IP and file-based infrastructure is largely based on Ethernet architecture with storage arrays using a different architecture between disks. However, media transport and control all travel over Ethernet.

The move to Ethernet switching topology changes the type, and in some cases quantities, of distribution and routing equipment. The cable traffic in the core equipment areas, as well as out to operations and production control spaces, is now mostly on Ethernet cable and fiber, resulting in lower density compared to using serial digital and analog baseband wiring. The interconnections from the core equipment area to technical operation areas are IP over Ethernet as well.

In addition to SDI technology, the core equipment room now houses the encoders and decoders, network switches, media servers, management servers, storage, and removable media transports (robots) that are used for archive. The IP workflow and technology systems are separate systems from the business network. This network must be high availability and with low latency to meet the demand of bandwidth-intensive media services. In the past, audio, video, control and communication had their own routers and distribution schemes; in IP, they use the same switches, cables and infrastructure. The IP protocols allow an Ethernet switch to be segregated into different segments for media transport, command and control, and communications. SANs use Fiber Channel and iSCSI between disk arrays and Ethernet for access to the production servers and workstations.

VLANs

In designing for IP, it is important to understand the use of VLANs and when it is necessary to have discreet

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physical networks. While a VLAN is physically within the same Ethernet switch, the switch can be programmed to direct the traffic only to those devices enabled for that segment of the network. These segments can be controlled and managed individually or connected.

The planning of the IP- and file-based infrastructure needs to consider the bandwidth requirements between systems and devices. There could separate VLANs for media transport, asset management, command and control, intercom, test and measurement, production, and distribution. Some network segments should be either private or physically separate — for example, edit, graphics, KVM, router control and CCU.

Some of these processes and applications may need to use or access the business (enterprise) network — traffic, scheduling, media browsing

and business intelligence, for example. The integration between the enterprise and media networks needs to be carefully planned and managed to avoid network congestion and manage bandwidth control.

Acquisition and ingest

SDI program content is encoded to IP, or IP is captured and transcoded. In this stage, the number of different files based on different bit rates will affect the load on a server and processor. In a typical IP environment, content is managed in three layers or bit rates. There is the high-resolution copy for archive and retention, the production bit rate, and a proxy copy for browsing and management.

On the distribution side, there can be a wide variety of bit rates, file types and formats to meet the delivery requirement of VOD, Web, tablets and smartphones. The decisions on bit

rate will be used in determining the encoding and transcoding requirements and the amount of processor power needed.

Craft production uses workstations networked in a VLAN with server-based management and integration to the SAN. File-based editing and graphics are comprehensive software packages needing fewer outboard devices. Studio production encodes direct to storage and accesses files as packages for play to air. Program contribution and distribution are SDI and IP. In contribution, incoming IP streams are captured as files and transferred to the production network. Or, files are uploaded to the facility, where they are transferred to the production network. Where the contribution is SDI, it is encoded to IP and then moves through the infrastructure for craft, archive or distribution. On the distribution side,

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program playlists are assembled within a server and controlled with automated systems, and files are played out in multiple formats.

Critical components

Metadata is a critical component. It's what enables the content to be identified, tracked, managed and moved through the infrastructure. A key process during content creation is naming the project and building the information set (metadata) that will stay with the file in its entire lifecycle. When program content enters the acquisition process, the metadata is what enables tracking, searching and associating more content that become elements of the program. This process is called asset management.

Command and control is another major part of the IP architecture. Most devices will use a browser interface or connected keyboard, video

and mouse for control, configuration and management. Since it is impractical to have a keyboard, mouse and screen in a control room for each device that needs managing, a KVM matrix is used. By using extenders, any keyboard, pointing device and monitor placed throughout the facility can access and manage all the servers and systems in the facility. The designer needs to consider the number of screens with keyboards and pointing devices in addition to the dedicated surfaces when planning for control rooms and technical operation spaces.

While the core IP switch is the heart of an IP infrastructure, the storage network handles all the media. There are different storage arrays for ingest, production and distribution. In planning for storage, growth is an important consideration. Storage has three tiers: online, nearline and of-

line, which is also archive.

In the file-based world, asset management tools allow browsing and searching all content, even if moved to offline. With search and browsing tools, ready access to the actual media is not always necessary if a producer can see the material needed for a production, create an EDL or even create a quick storyboard with images and sound.

Conclusion

The planning and design of the media-centric IP production and broadcast facility requires an understanding of IP network topology, file transfer, servers and storage management. Moving an SDI facility to IP needs to include all technical and business operations, as well as technology groups as stakeholders. **BE**

Gary Olson is the managing director at GHO Group.

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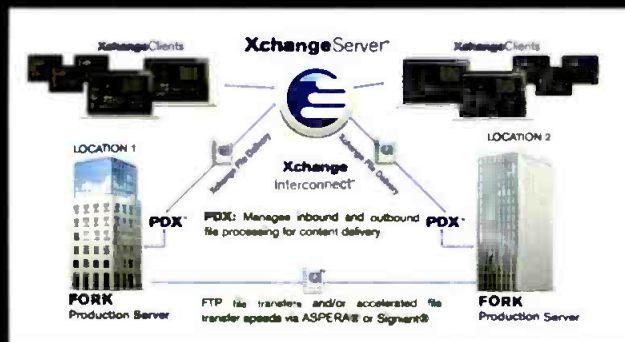
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AmberFin's iCR

TVT uses the system for ingest, transcoding and quality control.

BY JAKE ROBBINS

Being the engine room of a channel is our business. First established in 1994, TVT offers versioning, localization and media supply services spanning every part of the broadcast workflow. Between program planning and playout, we provide all the components to build channels: sourcing tapes and scripts, ingesting and transcoding, complying, editing, subtitling, translating, and then sending off by fibre optic. TVT is an automated engine room that SD and HD channels flow out of, day after day, to schedule.

Built in 2008, our Chiswick Park facility in London was created from the bottom up as a tapeless environment, for flexibility and for cost-effective control, to act as a single integrated system. So from the moment a program is scheduled, a trackable process takes place to a predetermined timetable, until that program joins hundreds on the conveyor belt, awaiting transmission.

At first glance, the facility resembles a high-tech factory. The original tapes go in one end; out the other end come re-versioned broadcaster files, each frame tailored to its chosen market — one small part of yet another channel. We're one of the only companies doing mass delivery of complete channels in long-form media file delivery to a variety of broadcasters. And, we're the only third-party company that deals with the bulk of material we do.

File-based workflow efficiency

About four years ago, we started working with AmberFin. We needed an integrated ingest, QC and transcoding system in which all the

parts "talked to each other." When the company's CTO, Bruce Devlin, demonstrated an early version of the company's iCR file-based ingest system at IBC in 2007, it was the first product we had seen that came close to what we were trying to achieve.

Selecting the solution was a no-brainer. The company was prepared to work closely with us because no one had really used the product in the way we were planning to use it. Often, because we're doing things on a global delivery scale, there were things we'd come up with that you can't test against. For example, formats of tapes come from the BBC that no one really uses anymore. For AmberFin, it was an interesting test bed.

As our two companies have grown up together, so have the ways that we integrate the file-based ingest system within our operations. Today, we employ nearly every aspect of the system, from ingesting incoming broadcast material, which is on tape; auto-QC'ing that material; performing a manual review of the auto-QC; and transcoding into different formats at various stages of the production line.

With the way we've set up the system, we can load up the Flexicart, and AmberFin will ingest material. The Flexi control enables us to capture everything. The company has taken our interface and integrated it with the system, which gives us an additional buy-in to the services. Due to the way the QC process works, we've

ingested everything. The entire process is expedited through automated ingest and QC. I can have one-hour HD programs QC'd in five to 10 minutes. Without it, I'd need to employ more staff and technically have longer days. It has enabled us to have a slick workflow.

A useful element of the system is the timeline, which shows the user



The addition of Unified Quality Control (UQC) to iCR enables TVT to create a high-quality file-based HD/SD master, provide unique file conversion to multiple formats, and implement appropriate levels of automated and manual quality control.

a thumbnail picture of the actual problem. Other systems I've used show a piece of black in the middle of the picture. Then I'd have to go to the original to see what the problem was. By doing the reverse of that, the iCR has sped up the process. As a media factory, efficiency is a key requirement for us. We wouldn't have invested in the system if it didn't significantly increase our efficiency.

Our aim is to streamline the entire operation, so we have gone even further and automated ingest using iCR (a development that Amberfin has bought from us to add as an option to its product line). This and the auto-QC particularly expedite our workflow.

Today, the system is the only way in which we ingest tapes and QC them. We also use the system to transcode our master formats to whatever format the eventual client requires.

File QC

Unified quality control is an increasingly important issue within file-based workflows, especially when content owners are looking to exploit new distribution platforms such as PCs, smartphones and games consoles. Last year, we acted as a beta test partner in a key development at AmberFin.

As a result, at IBC2011, the company introduced the Unified Quality Control solution for content ingest and transcoding operations. It's called iCR Unified QC (UQC), and it's a neat approach to quality control that combines multiple tools for baseband checks during tape ingest,

file-based QC after ingest and overall operator-controlled QC, including annotation and mark-up.

The addition of UQC to iCR means that users like us have the potential to create a high-quality file-based HD/SD master, provide unique file conversion to multiple formats, and implement appropriate levels of automated and manual quality control. And, we do all that within a single timeline.

We believe that UQC could be an important development in file-based workflows. Like all companies, we are beginning to receive more and more master material as files rather than tapes. Therefore, having a reliable, easy to use file QC solution is increasingly important.

Having a unified interface for tape and file QC is also important from a training point of view. Likewise, we are increasingly wanting to auto-QC

outgoing files before they are sent to the client, so having a unified interface for tape and file QC is important as well.

We are happy with our close working relationship with AmberFin's team. It means that as our business grows and develops, the company is able to respond to our changing needs by developing new features and functions within iCR.

As the user end, the product never stops; it's always growing, changing and evolving. You can make something work every time in the lab, but the lab does not always reflect real-life operations. It's not beta testing of the initial product; it's the continued testing of the evolving product. **BE**

Jake Robbins is the chief operating officer at TVT.



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Telemetrics Ballpark Cam

MLB Network hits a home run with the custom-tailored camera control system.

BY SERGIO PENETRA

It's about the boys of summer. It's about America's romance with the game. It's about MLB Network and Telemetrics bringing the experience of live baseball home to millions of fans through the use of Ballpark Cam, a remotely controlled ballpark camera system.

Ballpark Cam is a one-of-a-kind camera system that Telemetrics developed for MLB Network. It enables on-air personalities of the Secaucus, NJ-based network to take viewers directly into ballparks across Major League Baseball for pregame look-ins at players warming up, live candid views of game and park activities, and player interviews in the dugout before or after the game.

Jake Soto, engineering manager, Ballpark Camera Systems for MLB Network, says the system was conceived as an overarching way to give fans at home a view into the park. He explains that up to that point, if viewers had a subscription package, they might be able to see several games across the country, but no one was of-



With the Ballpark Cam system, MLB Network can take viewers directly into ballparks for pregame look-ins at players warming up, live candid views of games and park activities, and player interviews in the dugout before or after the game. Image courtesy MLB Network.

fering looks into every single park for every single game.

Capturing the action

The system was phased in over a three-year period starting in 2008, when ballparks throughout the league were equipped with point-of-view (POV) cameras that were positioned

in the dugouts and centerfield. The dugout cameras, used for capturing field and stadium views, are each mounted to a Telemetrics Televator EP-S3 weatherproof elevating pedestal, which is a remotely controlled motorized column that can be quickly elevated in height from 4ft to 12ft. The centerfield cameras are mounted



The centerfield cameras are mounted on Telemetrics PT-LWP-S3 pan/tilt heads that feature shot convergence technology and are enclosed in weatherproof housings.



The dugout cameras, used for capturing field and stadium views, are each mounted to a Telemetrics Televator EP-S3 weatherproof elevating pedestal. Image courtesy MLB Network.



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on PT-LWP-S3 pan/tilt heads that feature shot convergence technology and are enclosed in weatherproof housings. The additional cameras have since been installed in all but one of the 30 parks, and the final installation will be performed early this year.

Each of the parks is additionally equipped with a video router and four video encoders for multiplexed video transmission. All camera feeds are connected to a multi-viewer device for single-channel transmission in an HD format to a 4 x 4 matrix for preview, and every ballpark feed is done in the same sequence (i.e., a-clean video; b-dirty video; c-switched or camera video; d-matrix or multiviewer). Telemetrics DS-4 device servers are installed in the studio and remote sites to allow communication between the devices over the network connection.

Communication and control

The ballparks are each connected to the Secaucus studio via dedicated high-speed fiber. On game days, the control room operators "turn on" the link to connect to the ballpark. The system polls a park to see if it's up and if so, it will load the logo on the touch-screen panel. To make the connection for allowing remote control operation, the operator simply touches the team logo icon on the custom-designed remote control panel (RCP) screen, and the system will automatically start to receive the video feeds from that ballpark.

Video routers at the Secaucus location are programmed to direct the video to the main control room, a second control room, and to the engineering and acquisitions departments, for a total of five control panel sites. An additional two sites with control panels are used by MLB Productions, and on any given day, as many as six or eight people can be on the system.

Soto says that as long as users know the logos of the teams, they don't have to know much about baseball to operate the system because of its intuitive design.

Users must log in, and each user is assigned individual rights for control of specific ballparks and cameras. If a control panel is loaned to a local broadcaster for its use in controlling and including video from the Ballpark Cams in its broadcast, the control panel can be programmed to control only those cameras in that particular ballpark to eliminate the possibility of them inadvertently making changes to other Ballpark Cams. Additionally, the system is designed so that multiple databases are used to back up the control information, and all changes are synchronized for consistency.

Up to 16 ballparks can be simultaneously displayed in a 4 x 4 matrix with unified pan/tilt/zoom and focus control for every camera, as well as heater, blower and wiper controls. As many as 20 camera pre-sets for pan/tilt/zoom and elevator have been programmed for each of the approximately 180 cameras. The system also provides individual camera identification per the camera IP address to help

ensure operational precision.

According to Sergio Penetra, senior engineer for Telemetrics, the concept was about eight months in development and then a further two years of continuous development as MLB Network fine-tuned their requirements and program offerings. He says that the system is flexible; if the network wants to make a change or add a feature or piece of equipment, Telemetrics can change the software to accommodate them.

Smile for the cameras

The systems are in constant use during the regular season through to the end of the World Series, around the end of October, at which time maintenance and system reconfigurations or upgrades are done. The systems are turned back on in February. During the baseball season, MLB Network is on live for approximately

12 hours a day during the week.

Soto says the system has changed the way the network broadcasts. When the network first started, it did six interviews that first season. Now, it does at least six interviews an hour and for the entire time the network is on the air live; 75 percent of it includes video from the Ballpark Cams. Soto adds that for the players, the systems have become part of the dugout culture and definitely part of game day for them.

Likewise, Soto says that the network has been able to cut down on production costs because it doesn't have to move cameras from place to place to cover the games or have commentators and a camera crew on-site to conduct interviews. Further, the network has been able to develop new programming around the system, such as "The Rundown" and "Intentional Talk."

Team effort

Operational status is programmed into the system, and issues such as communication link problems will show on the indicators as a red or yellow status, depending on how far the connection is reaching. The system features basic diagnostics and is supplemented by separate software for more advanced diagnostics. New software features are made available in hard copy to Secaucus, and Telemetrics can make firmware changes remotely.

In addition to Telemetrics, CBT Systems of San Diego was involved in the initial system design and was responsible for installation of the cameras throughout the ballparks and the integration of the system at MLB Network.

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Sergio Penetra is an engineer at Telemetrics.

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Portable lighting

Improved technology has made it easier to capture images.

BY JOHN LUFF

The broadcast business is about capturing images and using them to create content that informs, enlightens and entertains. All of that starts with replicating the human sense of sight. Nothing could be simpler than lighting a scene and shooting it with a camera (which then samples the light and codes it digitally before passing it down a coax/triax/fiber — well, you get the idea).

The first part of sight, or image capture, is finding a scene with adequate illumination to make rendering the image possible. The human eye can adapt to an incredible range of illumination, from starlight to full sun, a range of about 90dB, or 24 stops, a ratio of around 108:1. It is that dynamic range that makes it possible for humans to operate as both diurnal and nocturnal animals.

Cameras are not as flexible. At any illumination level, the useful range of a camera is about 20dB to 30dB less than what the human eye can accommodate. Eight-bit sampling limits the dynamic range of a camera to about



Improved lighting technology is one element simplifying the process of capturing content. Shown here is the Litepanels MicroPro on-camera light at the Beatles LOVE 5th anniversary performance last June.

rendition of the content that is pleasing to the eye at the time of image viewing. It is important to note that this is the point at which “machine vision” kicks in; our eye might not think the scene was optimally lit, but the camera “sees” it as perfect. In the

DC-powered light that was switched on only when film was rolling. Any adequate amount of light simply sucked so much power out of a battery that it was not practical to run it more than absolutely necessary. The same was true for early ENG and EFP cameras recording on 3/4in, 1/2in or 1in tape.

The sensitivity of the cameras was good; but they still required a lot of light, which equated to a lot of weight in batteries. Cameramen often wore two belts for powering the camera and the lights, or carried the battery on the camera and a second battery in the VTR slung over their back (or that of an assistant). Or they did all of the above with a second belt held for powering the light when the first belt ran low. In some cases, the sheer weight and volume of batteries meant a second person on the crew, who acted as both lighting and sound technician, was absolutely necessary. The issue is

In some cases, the sheer weight and volume of batteries meant a second person on the crew, who acted as both lighting and sound technician, was absolutely necessary.

eight stops, while 14-bit processing can allow as much as 14 stops of dynamic range. Even at that, the camera can reproduce a contrast ratio of only about 16,000:1.

In outdoor and studio setups, lighting plays a critical role in setting the dynamic range of the scene. This makes it possible to capture a

case of news footage capture, the ultimate challenge is to achieve the same end without bringing a grip truck and a staff of lighting technicians. Here the battery enters the story.

Battery-powered light

Film cameras used for news often had battery belts that plugged into a

not weight, however; it is energy consumption and energy density, and the efficiency of the light in converting electricity to illumination power.

Progress in lighting

In today's production world, things have gotten much simpler. First, the camera requires less power (i.e. smaller batteries), is much more sensitive (requiring less light for acceptable performance) and weighs less. The weight is critical. Less weight in the camera means that a photographer can bring along more light. This, of course, replaces the weight lost in the camera and its battery, but it also means more energy. But, at the same time that the camera has made options for lights more appealing, and less critical due to the camera's own sensitivity, the science that drives portable lighting has allowed improvements in luminaries for portable use that have opened up a set of options that would have been just as stunning (if not more so) 30 years ago when ENG cameras started to evolve into useful tools.

The effect of research and good engineering has been to make the lights more efficient in terms of conversion of electricity into illumination, lower in weight and less costly to run due to longer life times. At the same time, battery technology has allowed marked improvement in the amount of energy stored in a unit of volume or weight. This results in the same amount of run time in lower weight, less bulky batteries or longer run time in the equivalent size/weight battery.

High-power LED and highly efficient halogen lights are the drivers from the illumination side of the equation. LEDs can provide nearly as much light as halogen for close-in work. Also, due to the extended size of many of the luminaries, the light is less harsh (softer) than what used to be seen on the top of ENG and film cameras. The power efficiency of LED lights for ENG use is about 7X to 10X better than incandescent sources, and they emit much less heat as well.

There is no free lunch, of course. LED lights have struggled to reach the other performance expectations of incandescent sources. The issues most often brought up are the ability to focus the instrument, and the color temperature of LED luminaries. Early LEDs looked OK to the eye, but produced strange effects on some scene content due to the nature of the light. LEDs produce light at specific wavelengths. By grouping LEDs of different colors, or by using phosphor coatings on some, the overall response of the camera may be fine. However, with some colors, LEDs may not render the scene as naturally as a black-body luminary such as incandescent. In the last few years, the ability of LEDs to render scenes effectively has been vastly improved.

Early LED instruments were simply arrays of LED chips, which meant the luminary could not be focused like a fresnel instrument. However, LEDs now can be put into small, efficient and focusable luminaries that allow much more lighting flexibility.

Another important factor is the life of the "bulb." Incandescent sources may last 1000 hours with proper care. However, LEDs should last 25 to 50 times as long, which makes their initial higher cost much more acceptable. In studio settings, where air conditioning is needed, LEDs provide a second benefit because they produce considerably less heat. Most broadcasters are trying to be good environmental stewards, which makes the lower power consumption of LEDs a large benefit.

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John Luff is a television technology consultant.

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The tease of ATSC M/H

After years of false promises, delivery needs to happen.

BY ANTHONY R. GARGANO

From time to time, the world of advertising hits a home run by producing memorable television commercials with catchy sayings that eventually join the day's lexicon. One that comes to mind is, "I can't believe I ate the whole thing," popularized by Alka Seltzer in a series of commercials aired beginning in 1972. Alka Seltzer reprised the saying in new ads in the early 2000s, but it didn't catch on the second time around. Perhaps it was a testament to another saying, not from television but from the gifted hand of Thomas Wolfe: "You can't go home again."

We can all recall "putting a tiger in our tank" and "not leaving home without it" or entrusting ourselves to the "good hands people." With that as a backdrop, perhaps you can understand why one of those famous sayings came to mind when I recently evaluated the current state of Mobile DTV.

Once again, at this year's preeminent consumer tech gadget event, the Consumer Electronics Show (CES), much hype existed over ATSC M/H, or more commonly Mobile DTV. One can't help but wonder how many successive years a technology can be introduced, reintroduced and reintroduced yet again? Some years ago, I cautioned the ATSC not to take too long with the M/H standardization process as the market window might quickly pass. Little did I realize that the ATSC would prove to be the hare as opposed to the turtle of the commercialization process that began once the standard was adopted.

With my being an inveterate Apple junky who owns too many "i" devices, Tivizen's CES 2011 announcement of an ATSC M/H version of its DTV dongle, which would allow my iPad to become a Mobile DTV

receiver, was exciting indeed. Availability in the U.S., it advised, would be in June 2011. Ten months later, there is not even a hint (as of this writing) of said dongle. In the meantime, my iPad now brims with television apps. With player apps from ABC, NBC, PBS and TNT, plus the TV apps from Xfinity TV, HBO Go, Livestation and Nettetalk TV, there is plenty to watch. Then, there's the master of TV apps, the Slingbox Player, which allows access to not only real-time broadcast content, but also to the content library recorded on a DVR.

If the industry does not make it happen this year, it's not going to happen.

My latest foray into the nebulous world of Mobile DTV was an unscientific consumer check by walking into a local branch of gadget heaven Best Buy to inquire about Mobile DTV. My first stop was the Mobile Electronics department, where they sold anything but. Explaining ATSC M/H Mobile DTV simply brought back blank faces; a walk to the televisions section did the same. Going online to Best Buy's e-commerce site, a search for Mobile DTV revealed but one product. Interestingly, a search of B&H, one of the largest East Coast mail order electronics sites, followed by a similar search on Fry's, one of the largest on the West Coast, produced equally similar results.

And so, with this dearth of consumer products and several years into introductions and reintroductions, the result is we can count the product

offerings on one hand. That said, is it any wonder why the "beef" question made so popular in those Wendy's commercials of yore immediately came to mind? Ah, but there were numerous Mobile DTV product introductions at this year's CES, right? Yes, but once again with delivery promises for later in the year. Will these products actually show up on retailers' shelves? Still awaiting delivery of last year's Tivizen iPad dongle, past track records do not engender a high level of confidence.

But alas, the entire blame cannot be foisted upon just the consumer electronics industry. In yet another Wendy's moment, a check of the Mobile DTV Station Guide, on the Open Mobile Video Coalition (OMVC) web site, reveals that through the end of January, only 119 stations across the country are on-air with Mobile DTV.

Has the market window passed? Probably not, if Mobile DTV products really start shipping and if the service can deliver some level of unique value proposition to the consumer. But, with the cable industry's TV Everywhere initiative, the availability of Slingboxes, 7in and 9in portable ATSC TVs selling for as little as \$50, a host of video apps available for tablets and smartphones, and HDTV USB tuner dongles available for netbooks, laptops and desktops, the marketplace is rife with solid choices and embedded competition.

CES 2013 cannot host yet another reintroduction of Mobile DTV. If the industry does not make it happen this year, it's not going to happen. **BE**

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

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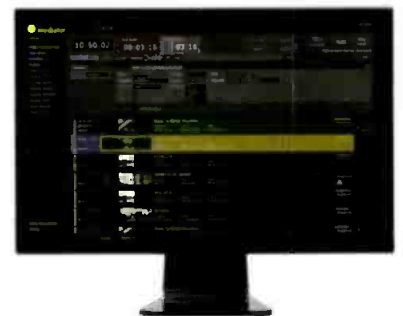
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