The BroadcastEngineering Digital ReferenceGuide

A supplement to *Broadcast Engineering magazine* - DECEMBER 2010

>//ACCESS GRANTED

Your access to the #1 technology resource for products and solutions

A PENTON MEDIA PUBLICATION

www.broadcastengineering.com

www.aja.com

Route it. Convert it.
Connect with AJA.

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

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

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

FiDO
SDI - at the speed of light...

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

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

Because it matters.

AJA® VIDEO SYSTEMS

Screen Service
AMERICA

RRD USA

There's a Business in your viewers freedom
Give a global mobile access to your content

SPEED

The ATSC Mobile DTV turnkey solution

Multiplexer MH | Encoders | ESG Flute Server | TV Exciters & Transmitters

SCREEN SERVICE AMERICA LLC

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

RRD USA Inc.

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

CONTENTS

YOUR ACCESS TO THE #1 TECHNOLOGY RESOURCE FOR PRODUCTS AND SOLUTIONS

The *Broadcast Engineering* Digital Reference Guide gathers all the information you need to locate products and vendors for your next project into one printed source.

You can identify vendors by product category or alphabetically. In addition, all of this information is available electronically on the *Broadcast Engineering* website. You can electronically search for vendors by name or product category in seconds. Go to *www.broadcastengineering.com*, and give it a try.

This year's entries are ...

The *Broadcast Engineering* Excellence Awards have become the hit of the industry as stations, networks, vendors and systems integrators all vie for top honors. This year is no exception, with 48 entrants — all wanting to be picked as the top facility in their category!

After reading the entries, go to the *Broadcast Engineering* website, and click on the Excellence Awards button. You will be taken to the voting page. Select one entry from each category as your favorite.

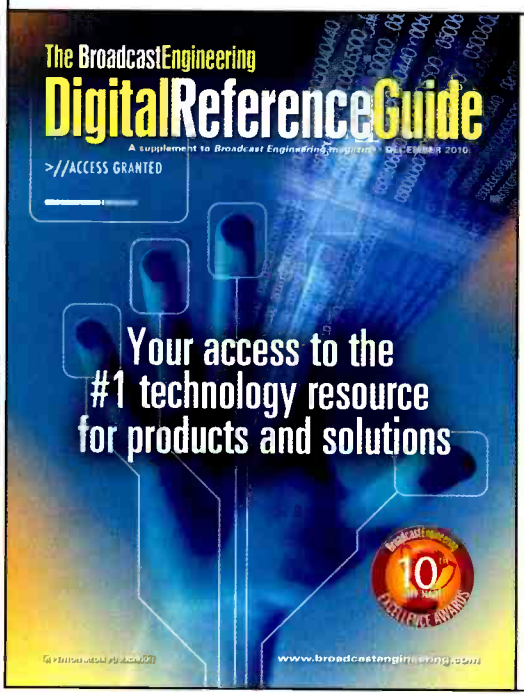
Complete your voting by Feb. 1, 2011. The winners of the Excellence Awards will be announced in the March pre-NAB issue.

Brad Dick
Editorial Director

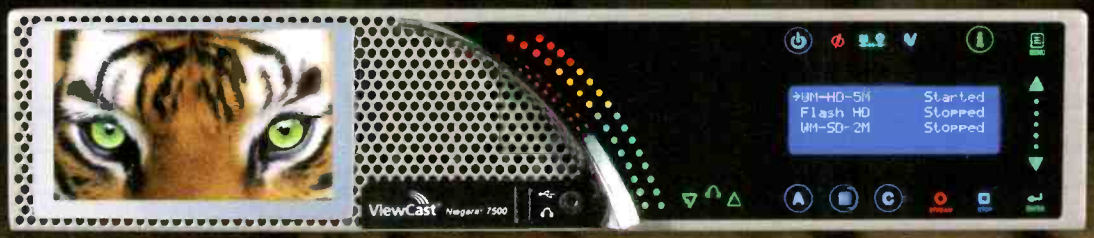
Readers select the winners

You choose the winners of the *Broadcast Engineering* Excellence Awards.

See page 29 for this year's entries, and look for the March NAB issue to find out who the winners are!



Beauty on the outside.
Beast on the inside.



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

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

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

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

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

ViewCast®

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

©2010 ViewCast Corporation. All rights reserved. Osprey®, Niagara®, and Niagara SCX® (and design)™ are registered trademarks of ViewCast Corporation, 3701 W. Plano Parkway, Suite 300 Plano, TX 75075. Product specifications subject to change without notice.

PRODUCT INDEX

PRODUCT INDEX

PRODUCT DIRECTORY

AUDIO ACCESSORIES

Acoustic materials

Acoustics First Corp
888-765-2900

Russ Burger Design Group
972-661-5222

Audio accessories

Aviom Inc
610-738-9005

Bittree
800-500-8142

Census Digital
416-850-0071

K-Tek
760-727-0593

Petrol
845-268-0100

Audio codecs

Dolby Laboratories Inc
800-33D-OLBY

Audio meters

Cobalt Digital Inc.
800-669-1691

Logitek Electronic Systems
800-231-5870

RTW GmbH & Co Kg
+49221709130

Ward-Beck Systems Ltd
800-771-2556

Audio monitor amplifiers

Ward-Beck Systems Ltd
800-771-2556

Wohler Technologies Inc
888-5-WOHLER

Audio patch panels

ADC
800-366-3889

Bittree
800-500-8142

Gepco Intl Inc
800-966-0069

Switchcraft Inc
773-792-2700

Headphones

Audio-Technica US Inc
330-686-2600

beyerdynamic - USA
800-293-4463

RTS: Bosch Security Systems, Inc., Communications Systems Division
800-392-3497

Speakers

Avid Technology
800-949-2843

Azden
800-247-4501

Surround Sound accessories

Dolby Laboratories Inc
800-33D-OLBY

Enco Systems
800-362-6797

Linear Acoustic
888-292-3117

RTW GmbH & Co Kg
+49221709130

Ward-Beck Systems Ltd
800-771-2556

AUDIO MIXERS

Portable mixers

Aviom Inc
610-738-9005

Azden
800-247-4501

Calrec Audio Ltd
+44 1422 842159

Lectrosonics
800-821-1121

Wheatstone Corp
252-638-7000

Studio mixers

Avid Technology
800-949-2843

Calrec Audio Ltd
+44 1422 842159

Full Compass Systems Ltd
800-356-5844

Lawo North America
888-810-4468

Logitek Electronic Systems
800-231-5870

Salzbrenner Stagetec Mediagroup Inc USA
888-782-4391

Solid State Logic
+44 1865 842300

Wheatstone Corp
252-638-7000

AUDIO PROCESSING

Audio compressor/ expanders

Evertz
905-335-3700

Linear Acoustic
888-292-3117

Wheatstone Corp
252-638-7000

AUDIO RECORDING

Audio playback devices

Enco Systems
800-362-6797

AUDIO ROUTING

Audio A/D-D/A converters

Blackmagic Design
408-954-0500

Census Digital
416-850-0071

Ensemble Designs
530-478-1830

ISIS Group
888-622-4747

Nevion
805-247-8560

Prism Media Products Inc
973-983-9577

Ward-Beck Systems Ltd
800-771-2556

Audio compression

Ensemble Designs
530-478-1830

Linear Acoustic
888-292-3117

Rethink embedded audio routing

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

Miranda

Rethink what's possible

TV TECHNOLOGY EUROPE
STAR 2010
Superior Technology Award Recipient

www.miranda.com/nvision

PRODUCT DIRECTORY

Audio DAs

Cobalt Digital Inc.
800-669-1691

Ensemble Designs
530-478-1830

Multidyne Video & Fiber Optic Systems
800-488-8378

Nevion
805-247-8560

Ward-Beck Systems Ltd
800-771-2556

Audio routers

Delec
+49 6351 1317 0

ISIS Group
888-622-4747

Lawo North America
888-810-4468

Logitek Electronic Systems
800-231-5870

Nevion
805-247-8560

Riedel Communications Inc
818-241-4696

Salzbrenner Stagetec Mediagroup Inc USA
888-782-4391

Wheatstone Corp
252-638-7000

Sample rate converters

Ward-Beck Systems Ltd
800-771-2556

AUTOMATION SYSTEMS

Asset management systems

Alteran Technologies
818-998-0100

Avid Technology
800-949-2843

Crispin Corp
919-845-7744

Dalet Digital Media Systems
212-269-6700

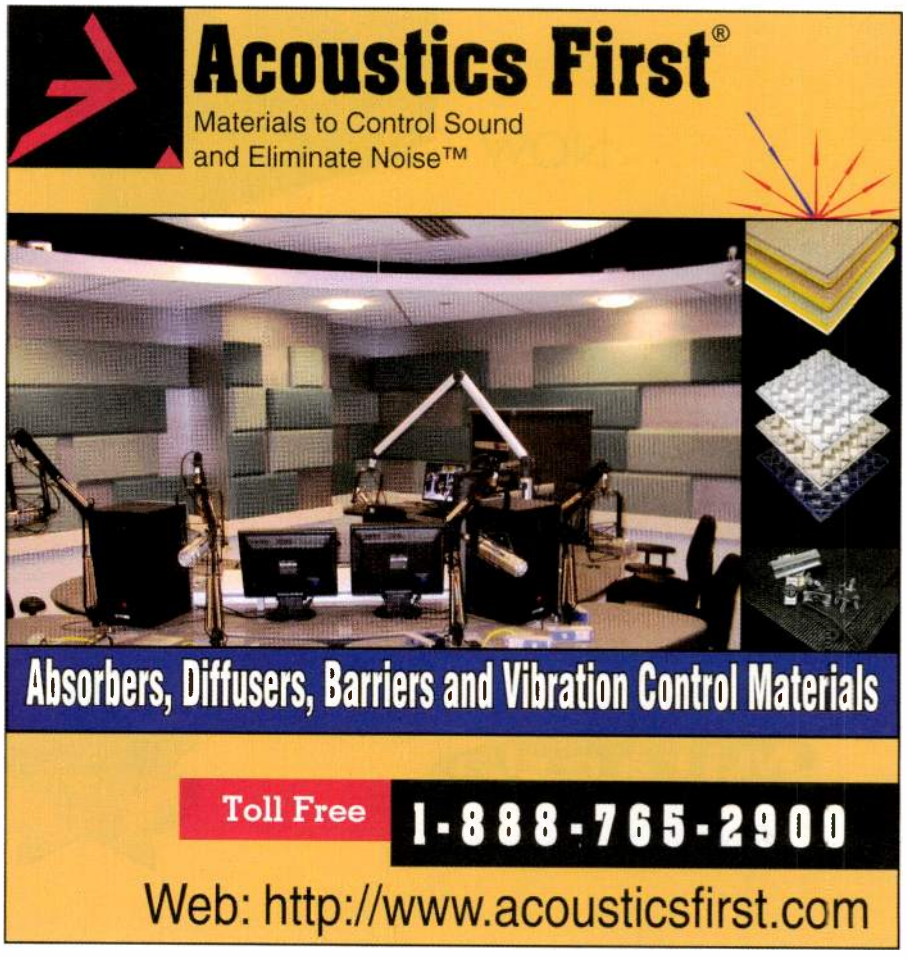
Digital Broadcast
352-377-8344

EditShare
617-782-0479

Florical Systems Inc
352-372-8326

Front Porch Digital
303-440-7930

Miranda Technologies
530-265-1000



Myers Information Systems
413-585-9820

PROTRACK TV

Myers Information Systems' ProTrack Media Asset Management (MAM) module
Myers' ProTrack Media Asset Management (MAM) module provides business rule-based life-cycle control over digital files. MAM ensures multi-channel / multi-platform content is identified, catalogued, moved to and from the appropriate playback platform, and archived. Asset locations, audio and video format, aspect ratio, and relevant metadata are accessible through the user interface and to automated processes handling migration between storage devices, playlist (automation) tasks, and content management.

NetApp
604-801-5300

Netia
+33 4 67 59 97 47

Pebble Beach Systems
+44 1932 333790

Pilat Media
+44 (0) 20 8782 0700

ProConsultant Informatique
33 3 87 37 78 78

SGT
+33 1 64 73 74 74

Signiant
781-221-4000

Solid State Logic
+44 1865 842300

Solid State Logic (SSL)
323-549-9090

Video Technics Inc
404-327-8300

ViewCast
800-540-4119

Vizrt
212-560-0708

VSN Video Stream Networks
+34 937349970

Xytech Systems Corp
818-303-7800

Zeus Broadcast
407-352-6501

Master control switchers

Avid Technology
800-949-2843

Lawo North America
888-810-4468

Netia
+33 4 67 59 97 47

Pixel Power
818-276-4515

Snell
818-556-2616

Utah Scientific
800-453-8782

TV business automation (traffic systems)

Myers Information Systems
413-585-9820

Myers Information Systems' ProTrack Broadcast Management Suite

ProTrack is a comprehensive, scalable, modular broadcast management system for single, multi?channel and multi?station facilities. Serves as the central unifying element, ProTrack integrates with existing infrastructures and third?party systems, such as: automation, archive, accounting, PSIP, web and proprietary internal databases to ensure optimal workflow efficiency and maintain current investments.

Pilat Media
+44 (0) 20 8782 0700

ProConsultant Informatique
33 3 87 37 78 78

VSN Video Stream Networks
+34 937349970

WideOrbit
+1 828 252 8891

WideOrbit delivers the most innovative solutions for managing broadcast and cable operations across sales, traffic, automation and billing. Our scalable, enterprise-wide solutions enable companies to manage multiple stations, channels and networks, as well as multiple mediums-including TV, Radio, Cable Networks, Cable Operators, Mobile Video and Digital Out of Home Networks-from a single system.

TV facility automation

Avid Technology
800-949-2843

Crispin Corp
919-845-7744

Digital Broadcast
352-377-8344

Florical Systems Inc
352-372-8326

Leightronix
800-243-5589

MATCO
800-348-1843

Miranda Technologies
530-265-1000

NVerzion
801-293-8420

Pebble Beach Systems
+44 1932 333790

ScheduALL
800-334-5083

SGT
+33 1 64 73 74 74

Telestream
530-470-1300

Vector 3
+34 934 151 285

Video Design Software
631-249-4399

ViewCast
800-540-4119

WideOrbit
+1 828 252 8891

Zeus Broadcast
407-352-6501

TV news automation systems

Avid Technology
800-949-2843

BitCentral Inc
949-253-9000

Crispin Corp
919-845-7744

Dalet Digital Media Systems
212-269-6700

Digital Broadcast
352-377-8344

Pebble Beach Systems
+44 1932 333790

Quantel
203-972-3199

Ross Video Ltd
613-652-4886

ScheduALL
800-334-5083

SGT
+33 1 64 73 74 74

Solid State Logic
+44 1865 842300

VSN Video Stream Networks
+34 937349970

CABLE TV EQUIPMENT

Broadcast cable equipment

ATCi
480-844-8501

Bridge Technologies
+47 22 38 51 00

EMCEE
480-315-9283

Leightronix
800-243-5589

MagicBox Inc
541-752-5654

Nickless Schirmer & Co
800-543-1584

Quintech Electronics
800-839-3658

Teamcast
+33 2 23 252680

Telestream
530-470-1300

Volicon
781.221.7400.x140

CATV system components

ATCi
480-844-8501

Kathrein Scala Div
541-779-6500

Nickless Schirmer & Co
800-543-1584

CAMERA ROBOTICS

Camera remote controls

Azzurro Systems Integration
201-767-0850

Shotoku Broadcast Systems
866-SHOTOKU

Telemetrics
201-848-9818

Vinten Radamec
845-268-0100

Robotic camera controls

Shotoku Broadcast Systems
866-SHOTOKU

Telemetrics
201-848-9818

Vinten Radamec
845-268-0100

Virtual sets

Vizrt
212-560-0708

CAMERA SUPPORT

Camera support products (tripods)

Anton/Bauer Inc
800-541-1667

CineBags Inc
818-662-0605

Miller Camera Support
973-857-8300

OConnor
818-847-8666

Sachtler
845-268-0100

Shotoku Broadcast Systems
866-SHOTOKU

Pan/tilt heads

Fujinon Inc
972-385-8902

Miller Camera Support
973-857-8300

OConnor
818-847-8666

Sachtler
845-268-0100

Innovation in the Multi-Screen World

snell

HD FOR LE$$

ICE makes HD playout more affordable than ever...

ICE is the most cost effective way to deploy local HD services, whether you buy or take advantage of our fantastic all-in finance offers that allow you to align revenue with cost, going HD has never been so affordable and easy. You can also have complete peace of mind knowing that your HD project is backed by one of the most trusted names in the industry.

Specifically tailored to address the demanding requirements of station operations such as live sports and news, ICE is a uniquely powerful combination of an integrated SD/HD playout/branding platform and Morpheus, Snell's enterprise class automation system.

Simple to install and simple to operate with the power and flexibility to meet any of your requirements, ICE is the only solution to bring you all these benefits and yet costs less than you'd think!

Sound too good to be true?
Check out the facts at hdforless.tv

snellgroup.com

Routing
Modular Infrastructure
Conversion & Restoration
Live Production
Automation & Media Management

Shotoku Broadcast Systems
866-SHOTOKU

Telemetrics
201-848-9818

Vinten Radamec
845-268-0100

CAMERAS

Camcorders

Full Compass Systems Ltd
800-356-5844

Camera accessories

Anton/Bauer Inc
800-541-1667

Autoscript Inc
203-926-2400

Band Pro Film & Digital Inc
818-841-9655

Brick House Video
+44 1962 777733

Century Optics
818-766-3715

Cobham
888-880-9339

DSC Laboratories
905-673-3211

Fujinon Inc
972-385-8902

IDX System Technology, Inc.
310-328-2850

K-Tek
760-727-0593

Litepanels Inc
818-752-7009

Miller Camera Support
973-857-8300

OConnor
818-847-8666

Petrol
845-268-0100

Sachtler
845-268-0100

Schneider Optics
818-766-3715

Cameras

ARRI Inc
845-353-1400

Band Pro Film & Digital Inc
818-841-9655

BroadcastStore.com
818-998-9100

Grass Valley
800-547-8949

Iconix Video Inc
800-783-1080

Ikegami Electronics
800-368-9171

WTI, Inc.
866-gotowti

CGS

Character generators

Avid Technology
800-949-2843

Chyron
631-845-2051

Compix Media Inc
949-585-0055

Horita Co
949-489-0240

MagicBox Inc
541-752-5654

Orad
201-332-3900

Pixel Power
818-276-4515

Softel
+44 118 9842151

Vector 3
+34 934 151 285

Vizrt
212-560-0708

Teleprompters and prompting software

Autoscript Inc
203-926-2400

CPC-Computer Prompting & Captioning
800-977-6678

COMPUTERS

Computer accessories

Blackmagic Design
408-954-0500

Sonnet Technologies Inc
949-587-3500

Computer networking products

ATTO Technology
716-691-1999

IPV
+44 1223 477 000

MCN Cabling LTD
306-664-6262

Computer systems

BOXX Technologies
512-835-0400

ScheduALL
800-334-5083

Data storage systems

ATTO Technology
716-691-1999

Avid Technology
800-949-2843

Enhance Technology Inc
562-777-3488

NetApp
604-801-5300

Proavio USA
562-324-6500

SAN Solutions
1 866-661-7144

Sonnet Technologies Inc
949-587-3500

Data transmission systems

ATTO Technology
716-691-1999

Avid Technology
800-949-2843

Communications Specialties Inc
631-273-0404

Video cards

Blackmagic Design
408-954-0500

Matrox Electronic Systems, Video Products Group
800-361-4903

ViewCast
800-540-4119

DAWS

Avid Technology
800-949-2843

Enco Systems
800-362-6797

Prism Media Products Inc
973-983-9577

Sony Creative Software Inc

DEALERS, DISTRIBUTORS, INTEGRATORS

Dealers, Distributors

Azzurro Systems Integration
201-767-0850

BroadcastStore.com
818-998-9100

CineBags Inc
818-662-0605

Communications Engineering
703-550-5800

Discount Video Warehouse
800-323-8148

Nickless Schirmer & Co
800-543-1584

Roscor
800-843-3679

Systems integrators

Alteran Technologies
818-998-0100

ATCi
480-844-8501

Azzurro Systems Integration
201-767-0850

COMMUNICATIONS ENGINEERING, INC.

Communications Engineering
703-550-5800

Heartland Video Systems
800-332-7088

Iconix Video Inc
800-783-1080

Larcan USA
303-665-8000

Lawson & Associates Architects
301-654-1600

MCN Cabling LTD
306-664-6262

Roscor
800-843-3679

CEI — Award-Winning Systems Integration, Plus Sales and Service For the Industry's Best Products

You've relied on CEI for 24 years to deliver world-class systems design, integration and service. Now, we're also providing superior broadcast and multimedia solutions, such as the Grass Valley™ K2 Dyno™ replay controller.

This compact, cost-effective controller is designed to help sports producers and other professionals capture live events in SD and HD resolutions and instantly play them out at variable speeds for critical analysis during fast-paced events.

In addition to offering complete turnkey systems and solutions, CEI also has a comprehensive **maintenance and repair center**, with full-time professional broadcast and IT engineers offering on-site and in-house repair, support and training.

Contact us for more information on our award-winning services, equipment sales and support.

COMMUNICATIONS ENGINEERING, INC.
703 550 5800 WWW.COMMENG.COM
SALES@COMMENG.COM

grass valley

PRODUCT DIRECTORY

Salzbrenner Stagetec Mediagroup Inc USA
888-782-4391

WireCAD
866-273-5298

GRAPHICS

Animation/Graphics software

Avid Technology
800-949-2843

Baron Services
256-881-8811

Boinx Software
49 89 84 00 55 00

Class on Demand
847-843-9939

Future Media Concepts
212-233-3500

Noise Industries

Orad
201-332-3900

Vector 3
+34 934 151 285

Video Design Software
631-249-4399

Vizrt
212-560-0708

Animation/Graphics systems

AccuWeather Inc

Avid Technology
800-949-2843

Baron Services
256-881-8811

Miranda Technologies
530-265-1000

Orad
201-332-3900

Pixel Power
818-276-4515

Video Design Software
631-249-4399

INTERCOM

Clear-Com Communications
510-337-6600

Delec
+49 6351 1317 0

Riedel Communications Inc
818-241-4696

RTS: Bosch Security Systems, Inc., Communications Systems Division
800-392-3497

Telex Communications
800-392-3497

LENSES

Lens converter/accessories

Century Optics
818-766-3715

Schneider Optics
818-766-3715

Lens systems

Fujinon Inc
972-385-8902

Schneider Optics
818-766-3715

LIGHTING

Lighting

Anton/Bauer Inc
800-541-1667

ARRI Inc
845-353-1400

K5600 Inc
800-662-5756

Kino Flo
818-767-6528

Litepanels Inc
818-752-7009

Videssence
626-579-0943

MICROPHONES

Microphone accessories

K-Tek
760-727-0593

Sennheiser Electronic
877-736-6434

Microphones

Audio-Technica US Inc
330-686-2600

Avid Technology
800-949-2843

beyerdynamic - USA
800-293-4463

Full Compass Systems Ltd
800-356-5844

Marshall Electronics
800-800-6608

RTS: Bosch Security Systems, Inc., Communications Systems Division
800-392-3497

Sennheiser Electronic
877-736-6434

Telex Communications
800-392-3497

Wireless microphones

Audio-Technica US Inc
330-686-2600

Azden
800-247-4501

beyerdynamic - USA
800-293-4463

Lectrosonics
800-821-1121

Sennheiser Electronic
877-736-6434

Telex Communications
800-392-3497

MICROWAVE & FIBER

ENG microwave links

Alcatel-Lucent
800-252-2835

Broadcast Microwave Services
800-669-9667

Cobham
888-880-9339

Comtech Xicom Technology Inc
408-213-3000

ELBER SRL

Microwave and RF Resources
509-585-9377

Vislink News & Entertainment (MRC)
800-490-5200

Fiber optic transmitter/ receiver systems

Blackmagic Design
408-954-0500

Census Digital
416-850-0071

Communications Specialties Inc
631-273-0404

Fiberlink® Matrix is a fully configurable and SMPTE compliant 32x32 optical router. The inputs and outputs can be ordered in quantities of one and the input and output quantities don't have to match allowing you to build a Matrix that is ideal for your specific application and budget!

Ensemble Designs
530-478-1830

Evertz
905-335-3700

LYNX Technik Inc.
661-251-8600

Multidyne Video & Fiber Optic Systems
800-488-8378

Nevion
805-247-8560

Radiall USA Inc
480-682-9400

Riedel Communications Inc
818-241-4696

thinklogical
800-291-3211

STL/TSL links

Alcatel-Lucent
800-252-2835

ELBER SRL

Heartland Video Systems
800-332-7088

Kathrein Scala Div
541-779-6500

Microwave and RF Resources
509-585-9377

Multidyne Video & Fiber Optic Systems
800-488-8378

Screen Service Broadcasting Services
+39 30 3582225

TZ Sawyer Technical Consultants
301-461-2069

Vislink News & Entertainment (MRC)
800-490-5200

PRODUCT DIRECTORY

Telco interface equipment

Alcatel-Lucent
800-252-2835

Nevion
805-247-8560

MULTIMEDIA/INTERNET

Interactive systems

Class on Demand
847-843-9939

IPV
+44 1223 477 000

Softel
+44 118 9842151

ViewCast
800-540-4119

Vizrt
212-560-0708

Internet production systems

Avid Technology
800-949-2843

Netia
+33 4 67 59 97 47

Telestream
530-470-1300

Vizrt
212-560-0708

Media streaming equipment/services

AccuWeather Inc

Digital Rapids
905-946-9666 ext 212

Electrosonic Inc
888-343-3602

EVS Broadcast Equipment
+32 4 361 7000

Front Porch Digital
303-440-7930

MagicBox Inc
541-752-5654

Streambox Inc
206-956-0544

Telestream
530-470-1300

ViewCast
800-540-4119

The Niagara 7500 from ViewCast gives you HD streaming so advanced, it's simple. Features include:
•Switch on-the-fly between HD & SD sources
•Resize, scale & crop your HD source
•Stream in multiple formats, simultaneously
•Robust SDK for system integration

Wowza Media Systems
888-778-7997

POWER PRODUCTS

Batteries

Anton/Bauer Inc
800-541-1667

IDX System Technology, Inc.
310-328-2850

North Star Technical Services
800-842-1671

VideoTechSupply.com

Battery chargers

Anton/Bauer Inc
800-541-1667

VideoTechSupply.com

Power (AC) products

Middle Atlantic Products
800-266-7225

Staco Energy Products Company
866-261-1191

Versatile Power
408-341-4600

Power supplies

Versatile Power
408-341-4600

UPS systems

Hewlett-Packard, Rack & Power Infrastracture Group
800-282-6672

North Star Technical Services
800-842-1671

Staco Energy Products Company
866-261-1191

PRODUCTION SWITCHERS

DVEs

Blackmagic Design
408-954-0500

Keyers

Blackmagic Design
408-954-0500

Broadcast Video Systems Corp (BVS)
905-305-0565

Crystal Vision Ltd
+44 1223 497049

Eyeheight Ltd
866 469 2729

Production switchers

Blackmagic Design
408-954-0500

Brick House Video
+44 1962 777733

Broadcast Pix
978-600-1100

Eyeheight Ltd
866 469 2729

FOR-A America
201-944-1120

Grass Valley
800-547-8949

Ikegami Electronics
800-368-9171

Ross Video Ltd
613-652-4886

SENSIO Technologies
514 846 2022

Snell
818-556-2616

RECORDING MEDIA

Recordable media (tape and disc)

Maxell
800-533-2836

RF COMPONENTS

Dummy loads

Bird Technologies Group/TX RX Systems
866-695-4569

RF combiners

Dielectric Communications
800-341-9678

EMCEE
480-315-9283

Jampro Antennas Inc
916-383-1177

Propagation Systems Inc - PSI
814-472-5540

Radio Frequency Systems GmbH

RF transmitting tubes

Comtech Xicom Technology Inc
408-213-3000

ELBER SRL

Tower accessories/lighting

Antenna ID Products
610-458-8418

Radian - A divison of Prestige Telecom
905-339-4059

Sabre Towers & Poles
800-369-6690

Tower management services

Antenna ID Products
610-458-8418

TZ Sawyer Technical Consultants
301-461-2069

Towers

Antenna ID Products
610-458-8418

Electronics Research Inc
812-925-6000

MCN Cabling LTD
306-664-6262

Radian - A divison of Prestige Telecom
905-339-4059

Radio Frequency Systems GmbH

Sabre Towers & Poles
800-369-6690

Transmission line/ accessories

Dielectric Communications
800-341-9678

Electronics Research Inc
812-925-6000

Jampro Antennas Inc
916-383-1177

Propagation Systems Inc - PSI
814-472-5540

Radiall USA Inc
480-682-9400

Radian - A divison of Prestige Telecom
905-339-4059

Radio Frequency Systems GmbH

Sabre Towers & Poles
800-369-6690

SATELLITE EQUIPMENT

Satellite receivers and antennas

ATCi
480-844-8501

Comtech EF Data
480-333-2200

DVEO div of Computer Modules Inc
858-613-1818

Intelsat
212-839-1800

Newtec
+32 (0)3 780 65 00

Nickless Schirmer & Co
800-543-1584

SENSIO Technologies
514 846 2022

Vislink
+ 44 1494 774400

Vislink News & Entertainment (MRC)
800-490-5200

Satellite uplinks

ATCi
480-844-8501

Comtech EF Data
480-333-2200

Comtech Xicom Technology Inc
408-213-3000

Intelsat
212-839-1800

Media Broadcast
+49 761 590 14234

Newtec
+32 (0)3 780 65 00

Vislink
+ 44 1494 774400

Vislink News & Entertainment (MRC)
800-490-5200

STUDIO ACCESSORIES

Cable management systems

Gepco Intl Inc
800-966-0069

Middle Atlantic Products
800-266-7225

Optima EPS
770-496-4000

Cleaning equipment/ products

Maxell
800-533-2836

PRODUCT DIRECTORY

Engineering software

WireCAD
866-273-5298

Zeus Broadcast
407-352-6501

Master clock systems

ESE
310-322-2136

Outdoor display equipment

BUF Technology
858-451-1350

Racks/furniture

Forecast Consoles Inc
800-735-2070

Middle Atlantic Products
800-266-7225

Optima EPS
770-496-4000

Optima's new cabinet enclosure is ideal for broadcast and data center applications. It features extrusion-based modular design, advanced cable management, and a convex-shaped perforated door for additional cabling space and airflow. Optima's modular design approach makes customization faster, easier, and more cost-effective. Contact Optima today for details.

Storeel
770-458-3280

TBC Consoles
888-CON-SOLE

IntelliTrac® Console System

TBC's definitive technical furniture system sets new standards for modularity, ergonomics and high end aesthetics. Front and rear device tracks allow unlimited lateral positioning of monitors, speakers, phones and task lighting. Rack bay turrets may be easily upgraded or relocated allowing quick, user friendly modifications.

Studio accessories

Autoscript Inc
203-926-2400

Forecast Consoles Inc
800-735-2070

Tools

Gepco Intl Inc
800-966-0069

Transport cases

Anton/Bauer Inc
800-541-1667

Optima EPS
770-496-4000

Weather/data systems

AccuWeather Inc

Baron Services
256-881-8811

Vizrt
212-560-0708

TBCS & FRAME SYNCS

Aspect ratio converters

Ensemble Designs
530-478-1830

Nevion
805-247-8560

Telestream
530-470-1300

TV One
800-721-4044

Composite/component encoder/decoders

Ensemble Designs
530-478-1830

Nevion
805-247-8560

Ross Video Ltd
613-652-4886

Delay products

Crystal Vision Ltd
+44 1223 497049

Doremi Labs
818-562-1101

Ensemble Designs
530-478-1830

Nevion
805-247-8560

Frame synchronizers

Axon Digital Design BV
+18667579890

Cobalt Digital Inc.
800-669-1691

Ensemble Designs
530-478-1830

FOR-A America
201-944-1120

LYNX Technik Inc.
661-251-8600

Nevion
805-247-8560

HDTV up/downconverters

AJA Video Systems
530-274-2048

It's a multiformat world, and the new FS1 brings it all together... at a breakthrough price. Turn SD to HD, HD to SD, or HD 1080 into 720 (and vice versa), with FS1's hardware-based 10-bit up/down/cross-conversion.
Embed/disembed audio, adjust video/audio, HD captioning, remote control w/LAN-based web-server, DHCP, and SNMP monitoring, and much more.

Axon Digital Design BV
+18667579890

Blackmagic Design
408-954-0500

Brick House Video
+44 1962 777733

Cobalt Digital Inc.
800-669-1691

Crystal Vision Ltd
+44 1223 497049

Ensemble Designs
530-478-1830

Evertz
905-335-3700

Miranda Technologies
530-265-1000

Nevion
805-247-8560

Ross Video Ltd
613-652-4886

Telestream
530-470-1300

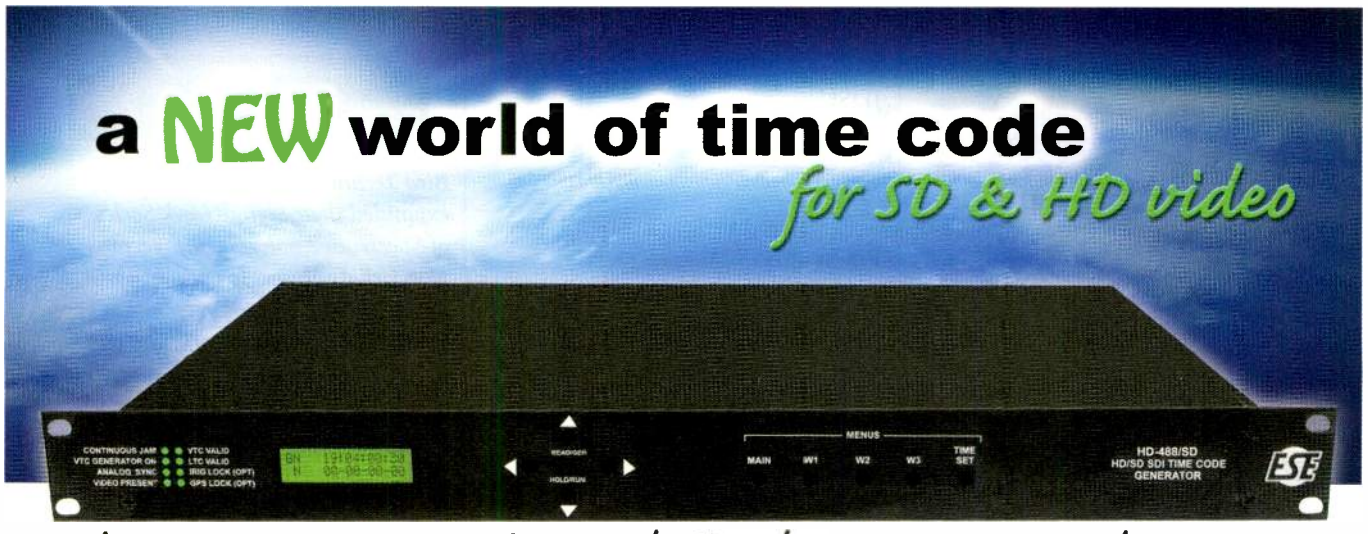
TV One
800-721-4044

Scan converters

Communications Specialties Inc
631-273-0404

The Scan Do® HD Scan Converter converts Digital DVI and Analog RGB, at resolutions up to 1920 x 1080, to 3G/HD/SD-SDI output, providing broadcast-quality video images. It supports all SMPTE 3G-SDI output resolutions up to 1080p, HD-SDI output resolutions up to 1080i and SD-SDI resolutions.

Ensemble Designs
530-478-1830



The ESE HD-488/SD Time Code Reader, Generator and Inserter

ESE introduces a new world of flexibility and features for time code with the HD-488/SD Time Code Reader, Generator and Inserter for HD and SD Serial Digital Interface video.

- Generates/Inserts Time Code • USB Setup Interface • User Friendly Control
- Universal Power Supply (90-264 VAC) • Accepts Multiple HD Formats
- Time Zone Offset • LCD Setup/Status Display • Dual LTC Output

ESE
142 Sierra Street
El Segundo, CA 90245 USA
Tel: (310) 322-2136
www.ese-web.com

Matrox Electronic Systems, Video Products Group
800-361-4903

TV One
800-721-4044

Standards converters

Axon Digital Design BV
+18667579890

Blackmagic Design
408-954-0500

Brick House Video
+44 1962 777733

Nevion
805-247-8560

Telestream
530-470-1300

Time base correctors

Ensemble Designs
530-478-1830

Video A-D/D-A converters

Blackmagic Design
408-954-0500

Cobalt Digital Inc.
800-669-1691

Ensemble Designs
530-478-1830

LYNX Technik Inc.
661-251-8600

Nevion
805-247-8560

Ross Video Ltd
613-652-4886

TEST & MEASUREMENT EQUIPMENT

Audio test and measurement equipment

ATCi
480-844-8501

DK-Technologies America
800-421-0888

Dolby Laboratories Inc
800-33D-OLBY

Hamlet USA at SENCORE Inc
866-4-HAMLET (426-538)

Lectrosonics
800-821-1121

Prism Media Products Inc
973-983-9577

RTW GmbH & Co Kg
+49221709130

Tektronix Inc
800-835-9433

Ward-Beck Systems Ltd
800-771-2556

Whirlwind
800-733-9473

Compression/MPEG test equipment

Audemat-Aztec
305-249-3110

DVEO div of Computer Modules Inc
858-613-1818

Ensemble Designs
530-478-1830

Hamlet USA at SENCORE Inc
866-4-HAMLET (426-538)

JDSU
800-478-4424

Nevion
805-247-8560

Pixelmetrix NA
866-749-3587

Sencore
605-978-4600

TANDBERG Television, Part of the Ericsson Group
678-812-6209

Tektronix Inc
800-835-9433

Triveni Digital
609-716-3500

Volicon
781.221.7400.x140

RF test equipment

Audemat-Aztec
305-249-3110

Bird Technologies Group/TX RX Systems
866-695-4569

JDSU
800-478-4424

Narda Safety Test Solutions
631-231-1700

Teamcast
+33 2 23 252680

Tektronix Inc
800-835-9433

Versatile Power
408-341-4600

Spectrum analyzers

Bird Technologies Group/TX RX Systems
866-695-4569

Bird Technologies Group has expanded their SignalHawk Series of Spectrum Analyzers and Vector Network Analyzers to include a dedicated Rackmount version. Over an Ethernet network, you can remotely analyze the performance of your system and diagnose problems before you even leave your desk. YOU'RE HEARD, LOUD AND CLEAR.

Narda Safety Test Solutions
631-231-1700

Nickless Schirmer & Co
800-543-1584

Tektronix Inc
800-835-9433

Sync/test generators

DK-Technologies America
800-421-0888

Doremi Labs
818-562-1101

Ensemble Designs
530-478-1830

Evertz
905-335-3700

Hamlet USA at SENCORE Inc
866-4-HAMLET (426-538)

Leader Instruments
800-645-5104

Tektronix Inc
800-835-9433

Test equipment-general

Actus Digital
+972-3-769-4737

DVEO div of Computer Modules Inc
858-613-1818

Hamlet USA at SENCORE Inc
866-4-HAMLET (426-538)

JDSU
800-478-4424

Leader Instruments
800-645-5104

Narda Safety Test Solutions
631-231-1700

Rohde & Schwarz
888-TES-TRSA

Sencore
605-978-4600

Tektronix Inc
800-835-9433

TV RF monitoring equipment

Audemat-Aztec
305-249-3110

Bird Technologies Group/TX RX Systems
866-695-4569

Tektronix Inc
800-835-9433

Video analyzers

Actus Digital
+972-3-769-4737

Ensemble Designs
530-478-1830

Hamlet USA at SENCORE Inc
866-4-HAMLET (426-538)

Tektronix Inc
800-835-9433

Telestream
530-470-1300

Triveni Digital
609-716-3500

Video monitors

Bridge Technologies
+47 22 38 51 00

Nevion
805-247-8560

Tektronix Inc
800-835-9433

Triveni Digital
609-716-3500

Volicon
781.221.7400.x140

Waveform monitors/ vectorscopes

Blackmagic Design
408-954-0500

DK-Technologies America
800-421-0888

Hamlet USA at SENCORE Inc
866-4-HAMLET (426-538)

Leader Instruments
800-645-5104

Tektronix Inc
800-835-9433

Broadcast and Satellite Engineers:

Correct Audio Levels

Automatically and Easily
(Affordably, too.)

"Viewer complaints stopped after we started using LevelTrack to automatically control audio levels *for our Retro TV channel. The best part about LevelTrack™ is that it is a software install, no changing out cards or re-wiring is necessary. It's made my life easier because it is a 'set it and forget it' feature. It controls audio levels with no further intervention."*

~PL Laird
Engineering Technical Manager, KEYE-TV

Call today for your free 30-day trial!

ENSEMBLE DESIGNS
530-478-1830
www.ensembledesigns.com

PRODUCT DIRECTORY

TV TRANSMITTERS, TRANSLATORS, EXCITERS & ANTENNAS

Frequency conversion equipment

EMCEE
480-315-9283

Quintech Electronics
800-839-3658

MMDS products

Axcera
800-215-2614

EMCEE
480-315-9283

Screen Service Broadcasting Services
+39 30 3582225

Remote control systems (transmitter)

Audemat-Aztec
305-249-3110

TV exciters

Axcera
800-215-2614

DMT USA
888-912-TEAM

Linear Industries Inc
877-428-5793

Linear Industries, Inc.
877-428-5793

Rohde & Schwarz
888-TES-TRSA

TV transmitters

Audemat-Aztec
305-249-3110

Axcera
800-215-2614

DMT USA
888-912-TEAM

EMCEE
480-315-9283

Larcan USA
303-665-8000

Lawson & Associates Architects
301-654-1600

Linear Industries Inc
877-428-5793

Linear Industries, Inc.
877-428-5793

Media Broadcast
+49 761 590 14234

Microwave and RF Resources
509-585-9377

Rohde & Schwarz
888-TES-TRSA

Screen Service Broadcasting Services
+39 30 3582225

Teamcast
+33 2 23 252680

TV transmitting antennas

Dielectric Communications
800-341-9678

DMT USA
888-912-TEAM

Electronics Research Inc
812-925-6000

Jampro Antennas Inc
916-383-1177

Kathrein Scala Div
541-779-6500

Linear Industries Inc
877-428-5793

Linear Industries, Inc.
877-428-5793

Propagation Systems Inc - PSI
814-472-5540

TZ Sawyer Technical Consultants
301-461-2069

VEHICLES

ENG trucks

BUF Technology
858-451-1350

Iconix Video Inc
800-783-1080

Staco Energy Products Company
866-261-1191

Satellite flyaway systems

Vislink
+ 44 1494 774400

Satellite uplink trucks

Media Broadcast
+49 761 590 14234

Vislink
+ 44 1494 774400

VIDEO ACCESSORIES

EAS products VBI data software systems

Broadcast Video Systems Corp (BVS)
905-305-0565

GPS equipment

Ensemble Designs
530-478-1830

Time code equipment

ESE
310-322-2136

Horita Co
949-489-0240

Video accessories

Apantac LLC
503-968-3000

Broadcast Microwave Services
800-669-9667

DFT Digital Film Technology
818-288-5503

DSC Laboratories
905-673-3211

Sonnet Technologies Inc
949-587-3500

Videoframe Inc
530-477-2000

Video captioning equipment

Broadcast Video Systems Corp (BVS)
905-305-0565

CPC-Computer Prompting & Captioning
800-977-6678

Ensemble Designs
530-478-1830

Softel
+44 118 9842151

Wohler Technologies Inc
888-5-WOHLER

Video patch panels

Bittree
800-500-8142

Switchcraft Inc
773-792-2700

VIDEO COMPRESSION EQUIPMENT

Compression encoder/decoders

Blackmagic Design
408-954-0500

Cobham
888-880-9339

Digital Rapids
905-946-9666 ext 212

Doremi Labs
818-562-1101

DVEO Broadcast Division
DVEO div of Computer Modules Inc
858-613-1818

Electrosonic Inc
888-343-3602

Evertz
905-335-3700

Heartland Video Systems
800-332-7088

IPV
+44 1223 477 000

Nevion
805-247-8560

Sencore
605-978-4600

SENSIO Technologies
514 846 2022

Streambox Inc
206-956-0544

TANDBERG Television, Part of the Ericsson Group
678-812-6209

Telestream
530-470-1300

ViewCast
800-540-4119

Compression pre-processors

Telestream
530-470-1300

Statistical multiplexers

TANDBERG Television, Part of the Ericsson Group
678-812-6209

Video compression systems

Alteran Technologies
818-998-0100

Broadcast Microwave Services
800-669-9667

Digital Rapids
905-946-9666 ext 212

DVEO div of Computer Modules Inc
858-613-1818

Telestream
530-470-1300

Video noise reduction systems

Ensemble Designs
530-478-1830

Telestream
530-470-1300

VIDEO EDITING SYSTEMS

Desktop video

AJA Video Systems
530-274-2048

Avid Technology
800-949-2843

Blackmagic Design
408-954-0500

Dalet Digital Media Systems
212-269-6700

DFT Digital Film Technology
818-288-5503

IPV
+44 1223 477 000

Matrox Electronic Systems, Video Products Group
800-361-4903

Telestream
530-470-1300

Editing systems and components

Avid Technology
800-949-2843

Blackmagic Design
408-954-0500

Boinx Software
49 89 84 00 55 00

DFT Digital Film Technology
818-288-5503

EditShare
617-782-0479

Future Media Concepts
212-233-3500

Noise Industries

Singular Software

Nonlinear editors

Avid Technology
800-949-2843

BitCentral Inc
949-253-9000

EVS Broadcast Equipment
+32 4 361 7000

Grass Valley
800-547-8949

Quantel
203-972-3199

VIDEO MONITORS

Line doublers/quadruplers

Communications Specialties Inc
631-273-0404

Multi-image displays

Apantac LLC
503-968-3000

Avitech International Corporation
425-885-3863

Barco Visual Solutions LLC
770-218-3200

Evertz
905-335-3700

Image Video

Miranda Technologies
530-265-1000

TV Logic USA
818-567-4900

Plasma/LCD Displays

Gennum, Video Products Div
905-632-2996

NEC Display Solutions
866-NEC-MORE

TV Logic USA
818-567-4900

Projectors

Barco Visual Solutions LLC
770-218-3200

Gennum, Video Products Div
905-632-2996

NEC Display Solutions
866-NEC-MORE

Video monitors

Ikegami Electronics
800-368-9171

Image Video

Marshall Electronics
800-800-6608

TV Logic USA
818-567-4900

Ward-Beck Systems Ltd
800-771-2556

Wohler Technologies Inc
888-5-WOHLER

Video presentation equipment

Apantac LLC
503-968-3000

Avitech International Corporation
425-885-3863

The Sequoia-Solo is a series of personalized multiviewers integrated with a switching function for keyboard/mouse, USB hub, speakers and microphone. The Solo takes multiple HDMI, DVI-I and HD/SD-SDI inputs. The Sequoia series streamlines desktop monitoring and operating of multiple video and computer systems for technical directors, producers and other professionals.

Blackmagic Design
408-954-0500

Video walls

Avitech International Corporation
425-885-3863

Barco Visual Solutions LLC
770-218-3200

Image Video

NEC Display Solutions
866-NEC-MORE

VIDEO ROUTING AND DISTRIBUTION

Control signal routers/patch panels

ADC
800-366-3889

Blackmagic Design
408-954-0500

Nevion
805-247-8560

Utah Scientific
800-453-8782

Videoframe Inc
530-477-2000

Video DAs

Blackmagic Design
408-954-0500

Census Digital
416-850-0071

Cobalt Digital Inc.
800-669-1691

Communications Specialties Inc
631-273-0404

Ensemble Designs
530-478-1830

ESE
310-322-2136

Horita Co
949-489-0240

Multidyne Video & Fiber Optic Systems
800-488-8378

Nevion
805-247-8560

Ross Video Ltd
613-652-4886

Ward-Beck Systems Ltd
800-771-2556

Video processing amplifiers

Ensemble Designs
530-478-1830

Multidyne Video & Fiber Optic Systems
800-488-8378

Nevion
805-247-8560

Video routing switchers

Blackmagic Design
408-954-0500

Communications Specialties Inc
631-273-0404

Ensemble Designs
530-478-1830

Evertz
905-335-3700

Gennum, Video Products Div
905-632-2996

Intelsat
212-839-1800

ISIS Group
888-622-4747

Miranda Technologies
530-265-1000

NVISION 8500 Hybrid embedded audio routers integrate audio processing to significantly streamline television infrastructures and eliminate video/audio timing issues. These 3D/3Gbps/HD routers integrate de-embedding, shuffling, break-away and re-embedding in a single frame. This means that everyday tasks, like swapping audio tracks, can be handled simply and elegantly by the router.

Nevion
805-247-8560

Quintech Electronics
800-839-3658

Riedel Communications Inc
818-241-4696

Snell
818-556-2616

thinklogical
800-291-3211

Utah Scientific
800-453-8782

VIDEO STORAGE

Archive/DVD Storage

Avid Technology
800-949-2843

BitCentral Inc
949-253-9000

Crispin Corp
919-845-7744

Digital Broadcast
352-377-8344

Enhance Technology Inc
562-777-3488

FOR-A America
201-944-1120

Front Porch Digital
303-440-7930

Maxell
800-533-2836

NetApp
604-801-5300

NVerzion
801-293-8420

Omneon
800-788-1330

Proavio USA
562-324-6500

SAN Solutions
1 866-661-7144

Commercial insertion equipment/software

Crispin Corp
919-845-7744

Digital Broadcast
352-377-8344

Florical Systems Inc
352-372-8326

MATCO
800-348-1843

On-air presentation systems

Chyron
631-845-2051

Crispin Corp
919-845-7744

Eyeheight Ltd
866 469 2729

NVerzion
801-293-8420

Still/clip stores

Chyron
631-845-2051

Video Technics Inc
404-327-8300

Vizrt
212-560-0708

Tape library systems

Storeel
770-458-3280

VDRs (video disk recorders)

Doremi Labs
818-562-1101

Electrosonic Inc
888-343-3602

Enhance Technology Inc
562-777-3488

Omneon
800-788-1330

Proavio USA
562-324-6500

Video servers

Avid Technology
800-949-2843

Digital Broadcast
352-377-8344

Doremi Labs
818-562-1101

EditShare
617-782-0479

Evertz
905-335-3700

Evertz introduces its new Media Client/Server System. This scalable, flexible and reliable architecture represents the next generation in media server solutions. The Evertz Media Clients allow broadcast facilities to perform real-time multi-channel HD or SD ingest, playout and branding as well as file ingest for file-based workflows. The Evertz Media Server provides multi-tiered storage for broadcast and post-production facilities that require a combination of high-performance Tier 1 storage and high-capacity Tier 2 storage. The combined result is a highly scalable, flexible and reliable I/O and storage architecture that supports multiple operational models. The complete server solution from one vendor.

EVS Broadcast Equipment
+32 4 361 7000

IDX System Technology, Inc.
310-328-2850

LEIGHTRONIX

Leightronix
800-243-5589

The ULTIMATE VIDEO SERVER has arrived, giving video professionals the perfect tool to bridge the gap between automated broadcast television and streaming video-on-demand. The UltraNEXUS provides the high-quality digital video playback and recording features needed for broadcast television operations along with digital video recording optimized for producing Internet-ready programming.

MATCO
800-348-1843

Omneon
800-788-1330

Quantel
203-972-3199

SAN Solutions
1 866-661-7144

Video Technics Inc
404-327-8300

VTRs (video tape recorders)

BroadcastStore.com
818-998-9100

BUF Technology
858-451-1350

WIRE, CABLE & CONNECTORS

Audio cable

ADC
800-366-3889

Belden
800-235-3361

Clark Wire & Cable
800-222-5348

Gepco Intl Inc
800-966-0069

Marshall Electronics
800-800-6608

Whirlwind
800-733-9473

Wireworks Corporation
800-642-9473

Audio connectors

ADC
800-366-3889

Fischer Connectors
800-551-0121

Gepco Intl Inc
800-966-0069

Neutrik USA
732-901-9488

Switchcraft Inc
773-792-2700

Telecast Fiber
508-754-4858

Whirlwind
800-733-9473

Wireworks Corporation
800-642-9473

Fiber optic cabling

ADC
800-366-3889

Belden
800-235-3361

Canare Corp of America
818-365-2446

Clark Wire & Cable
800-222-5348

Communications Specialties Inc
631-273-0404

Fischer Connectors
800-551-0121

Gepco Intl Inc
800-966-0069

Multidyne Video & Fiber Optic Systems
800-488-8378

Neutrik USA
732-901-9488

Riedel Communications Inc
818-241-4696

Telecast Fiber
508-754-4858

Modular frame systems

Videoframe Inc
530-477-2000

Video cable

ADC
800-366-3889

Belden
800-235-3361

Canare Corp of America
818-365-2446

Clark Wire & Cable
800-222-5348

Gepco Intl Inc
800-966-0069

Wireworks Corporation
800-642-9473

Video connectors

ADC
800-366-3889

Canare Corp of America
818-365-2446

Fischer Connectors
800-551-0121

Gepco Intl Inc
800-966-0069

Neutrik USA
732-901-9488

Telecast Fiber
508-754-4858

The BroadcastEngineering 10th annual ExcellenceAwards

48 cutting-edge facilities

Eight technology categories

Readers select the winners

Vote now!

Yes, it's time to vote again. Help *Broadcast Engineering* select the winners of the 2011 Excellence Awards.

The Excellence Awards recognize innovation, high-quality design and construction in telco, cable, broadcast and production facilities. Winners are selected by *Broadcast Engineering* readers through voting on the website.

With 48 entries from around the world, this year's contest includes some of the most sophisticated and high-tech facilities ever built. Each facility is competing for your vote.

To vote for your favorite installations, visit *www.broadcastengineering.com*. Click on the Excellence Awards button, and select one facility from each of the eight categories.

Votes must be entered by Feb. 1, 2011.

The winning facilities will be announced in the March 2011 issue of *Broadcast Engineering* and will be honored at the 2011 National Association of Broadcasters (NAB) convention.

Brad Dick

Brad Dick
Editorial Director

This year's Excellence Award entries are:

New studio or RF technology – station

New studio technology – network

New studio technology – HD

New studio technology – nonbroadcast

Station automation

Network automation

Newsroom technology

Post & network production facilities

Globo TV DENG site

Excellence Award category

New studio or RF technology — station

Submitted by

Globo Comunicação e Participações

Globo TV's new ENG reception site is located in the western area of Rio de Janeiro at the top of a 557ft mountain. It faces the neighborhoods of Jacarepagua on the north, Barra da Tijuca on the east and the Atlantic Ocean on the south. The Barra da Tijuca neighborhood is known as a culturally and economically developed area and is one of the main districts of the region, with a total area of 64sq mi and a population of approximately 220,000 people. The region has 17mi of ocean beach, the largest in Rio de Janeiro, three large lagoons and also smaller lagoons and canals, making it a desirable tourist location.

Most of the 2007 XV Pan American Games facilities were installed in Barra da Tijuca. Moreover, the infrastructure built for the event will be used during the 2016 Summer Olympic Games.

The cited growth has driven the need for live news coverage in the area, but Rio de Janeiro's mountainous terrain does not allow good RF coverage with the ENG receptions installed in the central part of the city. All live news coverage in Barra da Tijuca for the Pan American Games was made via satellite.

The main challenge of installing the new ENG system was to guarantee the coverage area and make it future-proof, because many high buildings are being built in the neighborhood. Other challenges in the project included shielding the receptions against interference and delivering the signal to the studio.

The reception system covers the frequency ranges of 2GHz and 7GHz and is compatible with both the DVB-T and LMS-T (Link Research's proprietary modulation scheme) standards. The receiver, model L2134, has four antenna inputs, which allows reception of mobile transmissions with maximum ratio combining.

The RF switching system, Junction Box, was developed at Globo TV with the main functions being to switch between the 2GHz and 7GHz bands and provide DC power to the RF block downconverters. The Junction Box and the downconverters are installed atop the tower where there are filters against 3G cell phone interference. The Junction Box is integrated and commanded by the Troll S350 slave controller, which also controls the receiver, sending commands and reading its status.

The demodulated RF received signal is sent in DVB-ASI (HD and SD) to the Globo TV main reception site using two pairs of bidirectional telecom PDH-E3 (34Mb/s) radios in the 15GHz band.

The site is unassisted, so it is remotely operated through an IP connection over the PDH radios. The reception control was totally integrated with the existing central reception system of the main station site.

After the installation, a coverage test was performed using fixed and mobile ground transmissions as well as helicopter transmission, the results of which came out as expected. The operational team was also trained during the tests and commissioning.

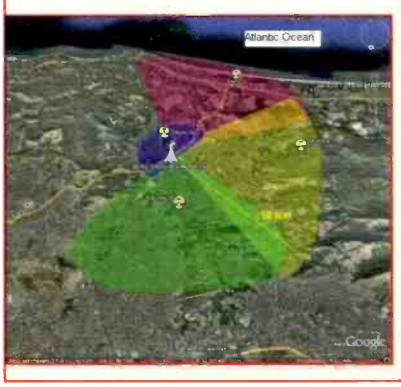
Nowadays, almost all the live news reports along that area are made through this new ENG site, improving capacity and agility for daily news production. ■

Design team

Carlos Eduardo Cosme Ribeiro, eng.; Josiaureo Santana Fernandes, eng.; Marcelo de Azevedo Miguel, eng.; Maximilliam Nunes Starling Vieira, eng.

Technology at work

Globo TV: Junction Box
NEC: PASOLINK PDH E3
Link Research: L2134, L3025-2024, L3030-6875
MRC: SectorScan II SEC13-2/7V-NLNF, Sector Scan II 2GHz/7GHz flat-panel sectorized antennas
Patropi: ONM-2G
Scopus: IRD-2980 MPEG-2 decoder
TANDBERG: TT6120 base format converter TTV E3/DS3
Troll Systems: S350



LDS Conference Center

Excellence Award category

New studio or RF technology — station

Submitted by

Harmonic

Design team

Church of Jesus Christ of Latter-day Saints: Sean McFarland, chief eng.; Del Clawson, satellite eng.; Charles Criddle, satellite eng.; David Gabbitas, master control eng.; David Larsen, satellite eng. mgr.

Diversified Systems: Greg Doyle, sr. eng.; TJ Kortlever, eng.

Harmonic: Joel Wilhite, solutions mgr.; Jeff Pockey, national acct. mgr.

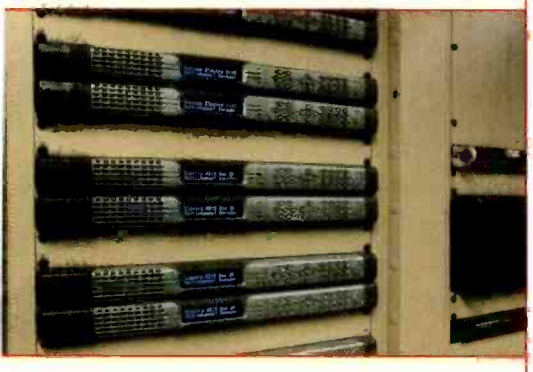
Technology at work

Evertz: VIPA-DUO multi-image processor

Harmonic: Electra 8000 universal encoder, NMX Digital Service Manager, ProStream 1000 stream-processing platform

NVerzion: Automation

Omneon: Spectrum media server



The Church of Jesus Christ of Latter-day Saints (LDS) has a history of embracing media to communicate its message to its members and the community, with its first radio broadcast in 1922 and first video satellite broadcast in 1972. The LDS Conference Center in Salt Lake City was built in 2000 with an HD broadcast and production facility to support the church's media and worldwide broadcast efforts. With the advances in broadcast technology in the last decade, the LDS staff determined it was time to update its master control facility and satellite headend equipment. Because the church delivers its messages in as many as 96 different languages worldwide, with some 140 channels of satellite audio, the complexities of such an operation required strong consideration of efficiency and accuracy in both monitoring and control as well as the optimization of bandwidth in transmission systems.

The newly updated facility meets the requirements with a new master control area with modern monitoring tools and a revamped satellite headend. This update enables greater broadcast accuracy with increased transmission quality and capability while reducing both capital and operational expenses.

After more than a year of analysis and review, plans were developed for the update based on the most demanding criteria that included long-range goals and maintaining current services. Diversified Systems was engaged for the design and integration of the master control phase of the project. The new master control design incorporates a completely new physical layout to improve operator ergonomics. Video monitoring is accomplished with Evertz VIP multi-image display processors, including newly incorporated technology to monitor up to 192 mono audio channels within the VIP system. Existing core systems, including the large-scale NVISION audio router and Omneon Spectrum media server, were further automated with newly developed software by NVerzion.

As the master control room was rebuilt, the LDS team selected Harmonic as the vendor for the new MPEG encoders. The new satellite headend uses Harmonic Electra 8000 universal broadcast encoders, which support HD/SD and MPEG-2/AVC, and ProStream 1000 processors for contribution and backhaul feeds. This combination of Harmonic equipment provides an open, flexible and cost-effective system for streamlined program distribution, with capability to transition to HD distribution (from MPEG-2 to AVC) and selective zone control that allows format-specific distribution by zone. The same holds true with the system's extensive language support.

The new system increases flexibility and reduces costs in a number of ways. Operational expenses are lowered with automation of multichannel monitoring that simplifies the need for monitoring by on-site personnel, while the Harmonic compression and stream-processing systems improve bandwidth efficiency. As a result, the new LDS facility can broadcast more content in higher quality to more people around the world.

PBS

Excellence Award category

New studio or RF technology — station

Submitted by

Volicon

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

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

PBS uses its new clip export capability to send video logs to its vendors in order to illustrate what was previously only able to be verbally communicated. This capability not only enhances communications and eliminates misunderstandings, but also helps to speed resolution of video or audio problems.

Another key challenge that the Observer will help PBS to meet is that of metadata logging, including AFD. The broadcaster has been embedding metadata and AFD in its MPEG streams since 2009, but until PBS adopted the Observer, the staff had no way of logging what had been sent. Soon, through Volicon development specifically targeted to PBS operations, the Observer will provide a fast and easy way of confirming that AFD codes have been sent correctly and that stations have received the data they need to display a given piece of video properly. If any metadata is determined to be incorrect, engineers in Alexandria will be able use the logging system to look back, see what metadata was transmitted and begin troubleshooting.

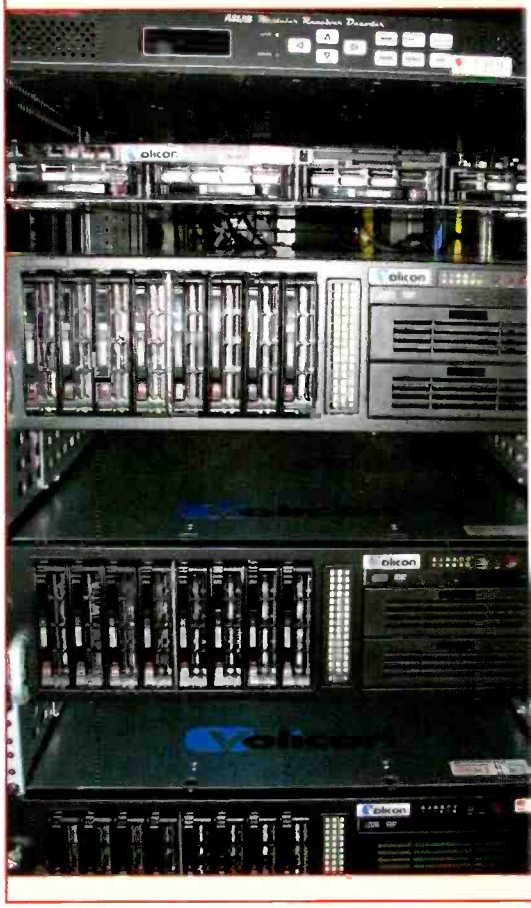
PBS made an early commitment to file-based operations at its Network Operations Center in Alexandria, and it continues to leverage advances in broadcast and multimedia platform technologies, including sophisticated video monitoring tools, to ensure the high quality and consistency of broadcast services provided through its extensive network of member stations.

Design team

PBS: Philip Schoene, sr. sys. eng.; Steven Francis, proj. mgr.; Bill Bowman, NOC tech. maint.; John Osborne, NOC tech. maint.; Yue Sun, NOC tech. maint.; Li-zhi Zhou, NOC tech. maint.

Technology at work

Belden: Cable
Sencore: 3187A IRD
Volicon: Observers, Monitor Server



QVC Italy

Excellence Award category

New studio or RF technology — station

Submitted by

TSL

Design team

QVC Italy: Mattias Brahammar, VP, TV ops. and leader of QVC eng. team; Malcolm House, sr. consultant and proj. leader
QVC Japan: John O'Neill, VP of TV eng., and his chief engineers
QVC UK: Leo Smith, broadcast proj. mgr.
TSL: David Phillips, managing dir. and proj. dir.; Andy Appleyard, project mgr.; Paul Busby, video eng.; Rob Milchem, audio eng.; Phil Cooper, control eng.; Nick Smith, network eng.; Jim Binks, video eng.; Andrew Pearce, video eng.; Jason Needham, video eng.; Steve Moore, installation mgr.

Technology at work

Lund Halsey: Technical furniture
Projects Department: Lighting
Quantel: Video servers and editing
Shotoku: Camera robotics
Snell: Routing and modular products
Sony: Cameras and vision mixers
The Wireless Works: RF distribution
TTL Video: Fiber infrastructure

QVC Italy's new HD broadcast facility in Milan is one of the most modern, functional and highly intuitive broadcast systems in the world. Based on comprehensive design ideas and detailed technical specifications provided by QVC for the entire system, TSL built and installed the system for QVC's new service to Italy, which went live on Oct. 1, 2010. At launch, QVC Italy reaches more than 18 million Italian households 24 hours a day with 17 hours of live programming. The channel is available on all primary distribution platforms: digital terrestrial television and on satellite via Sky Italia SpA and TiVu Sat. The launch boosts the home shopping network's global reach to approximately 200 million homes.

QVC Italy includes two identical live control rooms and four live studio floors, totalling more than 950sq m, plus one of the world's largest studio-based moving track lighting grid systems. Prebuild and testing took place at TSL's facility in Maidenhead, UK. QVC provided a large, proprietary scheduling, automation and asset management system with which all other technology was integrated.

The facility also makes extensive use of a highly customized TSL "Tallyman" professional tally and UMD management system, which interfaces with mixers, routers and multiviewers to provide the ability to throw facilities, at the push of a single button, from one live control room to the other. It is critically important that production at QVC Italy proceeds smoothly at all times, with no glitches from capture to transmission. Any miscommunication resulting in the incorrect designation of a presenter channel to a live studio or control room could, in this environment, have an effect on revenue.

The inherent flexibility of TSL's Tallyman system was evident in the degree of customization required to meet QVC's requirements and is central to the new facility. Tallyman's touch-screen control panel provides the ability to throw any of the key operations, instantly with the push of a single button, from Live Control 1 to Live Control 2, and vice versa. QVC Italy's new facility was a highly complex system to develop and test, but incredibly smooth and intuitive once installed. The project was divided into nine areas, three of which were due for July 2010 handover, with the other six due for September. Instead, TSL handed over seven areas — all of which QVC accepted — in July. The remaining two areas were also delivered ahead of schedule.

QVC, a wholly owned subsidiary of Liberty Media Corporation attributed to the Liberty Interactive Group, is one of the largest multimedia retailers in the world. QVC is committed to providing its customers with thousands of the most innovative and contemporary beauty, fashion, jewelry and home products.

TV Ônibus

Excellence Award category

New studio or RF technology — station

Submitted by

Globo Comunicação e Participações

Design team

Carlos Fini, eng. mgr.; Edson Moura, eng. super.; Carolina Duca Novaes, eng.; Danillo Ono, eng.; Fernando Del Nero, eng.

Technology at work

Visiontec: VT7000BUS
WiMobilis: WM-PlayTV

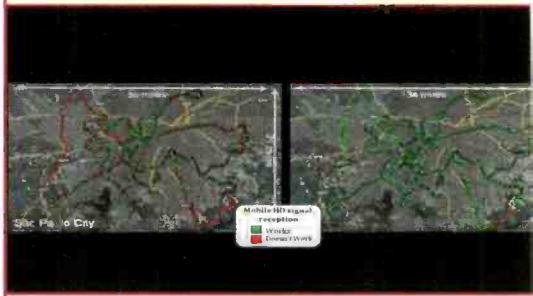
The beginning of DTV transmission in Brazil brought many new ways to watch live TV wherever the viewer is located. The Brazilian standard (ISDB-Tb) is able to transmit a dedicated service to mobile/portable devices; however, this signal has a low transmission rate that does not allow the transmission of any additional information. On the other hand, HD signals do not perform well when received on a moving platform or in a vehicle travelling at high speeds. In light of this, Globo TV created a receiver to meet the growing demand for devices capable of decoding the HD service in moving environments, as well as with the ability to receive additional data transmitted through the digital signal. It permits the sending of dedicated advertising according to the type of transportation to create a new segment dedicated to people who use public transportation in Brazil.

A four-branch diversity receiver was developed to improve the reliability of this full-seg reception in moving environments. The diversity usage allows an average gain of 6dB compared to a receiver that does not use diversity reception. Therefore, the area covered by the digital signal for full-seg service can be increased by up to 20 percent depending on the vehicle speed.

The project has been dubbed TV Ônibus (Bus TV) and was developed by the R&D team from Globo SP and manufactured by Visiontec da Amazônia. It has enabled the transmission of RSS and weather forecast information extracted in real time from the Globo.com website in addition to advertisements that can be static (JPEG or PNG) or dynamic (flash animation).

Globo TV serves 99.5 percent of the Brazilian population and produces 90 percent of its programming, including 2500 hours of soap operas and more than 1800 hours of news programs per year. It is a free-to-air TV network with a business model based solely upon advertising. Every day in São Paulo, 5 million people use 15,000 buses in the route between their home and job, spending an average time of two hours and 43 minutes daily in transit. Therefore, the HD reception of the digital signal in mobile environments enables Globo TV to reach this viewer segment and makes possible the transmission of dedicated additional advertisements. Furthermore, Globo TV is committed to keeping people informed and entertained, no matter where they are.

Globo TV has worked on this project since the end of 2008, when it was in its prototype phase. In 2009, after a request for proposal process, Visiontec was chosen as the partner to produce the receivers. In the beginning of 2010, 30 receivers in 10 different lines were installed in São Paulo to check the receiver performance. In light of the system's successful performance, Globo TV is in the process of developing 1000 additional units that will be installed through 2011.



Vegas PBS

Excellence Award category

New studio or RF technology — station

Submitted by

Solid State Logic

Design team

AZCAR: Steve Weiner, bus. dev. rep.; Al Marlin, proj. mgr.; Hakim Kharbut, lead eng.; Adam Stoddard, installation supervisor
JMA Architecture Studios: Michael Crowe, lead architect
Vegas PBS: George Molnar, dir. of eng.; Chris Cullen and Joe Cordova, telecom. specialists

Technology at work

Apple: Final Cut Pro production editing
Avid: Production editing, Sundance Digital Titan broadcast automation
Chyron: HyperX graphics
Clear-Com: Eclipse intercom
Evertz: Channel branding, distribution amplifiers, master control
Harris: Videotek rasterizers and off-air monitoring
Marshall: Video monitors
Omneon: Program storage and playback
Panasonic: Video monitors
Ross Video: OverDrive production automation, Vision production switcher
SAGE ENDEC: Emergency alert system
Sencore: IRDs for satellite
Solid State Logic: C10 HD consoles with MORSE router and Alpha Link Live I/O
audio consoles
Sony: 8000 production switcher, video cameras, video monitors
TANDBERG: Encoding and multiplexing
Volicon: Air logger
Wohler: Audio monitoring

Vegas PBS, the Public Broadcasting Service station serving the greater Las Vegas area, has opened a new, green-designed broadcast facility that has recently earned the coveted LEED Gold certification from the U.S. Green Building Council. Vegas PBS is licensed through the Trustees of the Clark County School District, which occupies half of the new building, expanding the station's mission well beyond PBS duties to include a virtual high school and educational media center. The various uses of the facility are diverse, encompassing everything from acting as a Level 2 Homeland Security site and providing an emergency response support system, to handling a homework program for local students, hosting local police seminars and providing an educational platform for students looking to make broadcast engineering a career. Designed by JMA Architecture Studios with AZCAR for systems integration, the station supplies programming for six broadband channels, one HD and two SD over-the-air channels and six cable channels, and it features a 2Gig WAN.

To handle the multiple audio missions of the facility while also meeting the needs of engineers and operators with greatly varying skill levels, Vegas PBS has installed two 32 x 8 fader Solid State Logic C10 HD consoles in Studios 1 and 2 tied together with an SSL MORSE router and four MORSE Stage Boxes. Two of the Stage Boxes perform SDI embedder/de-embedder duties in the main machine room, while the other two are located on each of the studio floors. SSL Alpha-Link Live units in the machine room and in each control room handle local source I/O. Both studio control rooms are identical, allowing for shared resources and maximum studio flexibility. The C10 HD has a small footprint (ideal for the compact control rooms at Vegas PBS), is convection-cooled (obviating the need for extra HVAC load capacity for a dedicated machine room) and offers impressively low power consumption. The C10 HD is fully compatible with the station's Ross OverDrive automated production control system.

Vegas PBS needed to take into consideration the wide range of console operators that would range from professionals to high school students working on a project. The C10 HD offers four levels of system availability that allows an engineer to effectively lock out console resources. The advanced audio engineer might enjoy full access, while an untrained student could be restricted to only riding faders without the capability of unraveling a production setup. The console has a Dialogue Automix feature that allows a user to set the relative levels of up to 16 microphones for a talk show-style setup. The system auto-senses activity on each channel, opens and closes channels automatically, and ensures that the overall gain of the combined signal remains constant to prevent the ambient background noise from fluctuating. The C10 also has a 5.1 upmix feature; a simple to operate mix-minus setup; and the Eyeconix display system, where a picture or graphic can be inserted for easy audio source identification — again to accommodate the various engineering skill levels. Students participate on all levels of production, including editing, camera and audio.

Comcast SportsNet Mid-Atlantic

Excellence Award category

New studio technology – network

Submitted by

Communications Engineering, Inc.

Comcast SportsNet Mid-Atlantic, located in Bethesda, MD, is the official television partner of the Washington Redskins, Baltimore Ravens, Washington Capitals, Washington Wizards, D.C. United, Atlantic Coast Conference and Colonial Athletic Association.

The network delivers more than 500 live sporting events per year, along with Emmy Award-winning news, analysis and entertainment programming, to more than 4.7 million homes throughout the District of Columbia, Maryland and Virginia, as well as parts of West Virginia, Pennsylvania and Delaware.

While the network had been capable of delivering some live events in HD, much of its programming was in SD due to the existing systems in the facility. Communications Engineering, Inc. (CEI) was chosen to handle a comprehensive HD upgrade and expansion of the studio and news facilities for Comcast SportsNet Mid-Atlantic, enabling all of the network's news and entertainment programming to be delivered in HD.

The project, which was completed on time and on budget, included upgrades to the production control room and studio, two additional master control rooms, equipment core area, transmission system and additional edit suites. CEI handled comprehensive design, equipment procurement, systems integration, installation, testing, training and overall project management for the HD upgrade and expansion.

A key challenge was meeting a hard deadline, which was the start of several collegiate and professional seasons in late summer. It was also imperative that CEI kept Comcast SportsNet Mid-Atlantic on the air at all times during the project, which was successfully accomplished.

With a broad scope and a firm deadline, plus the additional challenge of upgrading a working facility with no downtime or program interruption, the project team met the scheduling and technical requirements of Comcast. The result is that millions of sports fans across this region will enjoy much more quality HD programming from Comcast SportsNet.

Design team

Comcast SportsNet Mid-Atlantic: Steve Weber, dir. of eng.
CEI: Frank Giliotti, VP of technical services; Felix Pena, dir. of mechanical eng.; Tim Bailey, sr. managing eng.

Technology at work

Apple: Final Cut Pro edit systems
Click Effects: Crossfire HD clip server system
Chyron: Cameo graphics management, HyperX3 CGs
Fingerworks: Studio HD/SD telestrator
Fujinon: 2/3in Digi Power Select ENG HD lenses
Harris: NetVX HD encoders, NEXIO Volt servers, Velocity edit systems, waveform monitors and terminal equipment
Image Video: TSAI-3000 tally system
Miranda: Kaleido-X multi-image processors, master control switching, NVISION routing
Panther: Trixy and Vario jibs
Sony: BRCZ700 and HXC100K HD cameras, FWDS47H1 and FWDS42H1 professional displays, MVS8000 switcher, test monitors
Vinten: Osprey Elite studio pedestals, Vector 450 camera heads
Wohler: Audio and video monitors

ESPN transmission facility

Excellence Award category

New studio technology — network

Submitted by

ESPN

Design team

AZCAR: Mike Walter, sr. eng. consult.
Broadcast Systems Services: Richard White, proj. mgr.
ESPN: Andy Conklin, proj. mgr.; Rod Lane, lead sys. eng.
ESPN transmission facility: Bill Lamb, VP; Maura Maloney, sr. dir.; Glenn Scanlon, dir.; Shannon Schaar, assoc. dir. sys.; Lacy Pack, assoc. dir. network transport; Tom Evans, sr. sys. eng.; John Parlopiano, sr. sys. eng.; Matt Armata, sr. sys. eng.; Michael Gugliotti, mgr.; Rich Miska, mgr.
Evertz R&D: Jeff St. Denis; Colin Brown, IRM

Technology at work

Adtec: mediaHUB-HD 422 encoders, RD60 decoders
ATEME: CM4101 encoders, DR8400 decoders
Cisco: Nexus 7000 Series switch
Emcore: Optiva fiber transport platform
Ericsson: 1290 decoders, 1282 encoders, 8200 decoders
Evertz: 3000MVP, EQX baseband router, intelligent resource manager, QX CCM (ASI) router, XRF6 L-band router, VLPRO M&C system
Glowlink: Model 1000 spectrum monitoring
Net Insight: Nimbra 680 media platform
Newtec: AZ110 modulators
Pixelmetrix: REM-TSP120 transport stream processor
Plura: 24in multiformat HQ monitor
Quintech: LS12 L-band splitters
Snell: Alchemist Ph.C-HD
Sumitomo: Air-blown fiber
TBC: IntelliTrack consoles
Tektronix: WVR7120 rasterizer
Wohler: AMP2-E16-3G audio monitor

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

The consoles in the control room are sleek and display minimal physical equipment. By using GUI displays, ESPN was able to move the hardware to the equipment rooms, thus eliminating heat and noise in the control room.

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

Due to the tremendous growth of ESPNet, the private fiber network that is engineered, maintained and operated by ESPN's network transport team, a unique network operations center was required. Net Insight's Nimbra Vision platform provides service provisioning, bandwidth monitoring and alarm notifications for network events across all nodes in the system, which allows full view and enables fast response times to any network event on a 24/7 basis.

The new transmission facility is connected to various buildings on the ESPN campus via a large Sumitomo air-blown fiber network with more than 2300 connections. Available technical space increased five-fold with respect to the previous facility: 57-unit Stantron equipment racks expanded the usable vertical space by 1500RU. The new facility also houses a multiviewer platform system that provides 304 video inputs, 80 graphical inputs and 64 video outputs.

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

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

ESPN uses dual-redundant UPS power distribution across two diverse, firewall-protected equipment rooms. All air-critical equipment has been distributed across two rooms for maximum operational resiliency in the event one room is compromised.

METROETHERNET

Excellence Award category

New studio technology — network

Submitted by

Globo Comunicação e Participações

Some broadcasters have turned their backs to the IT world because, to them, IP means "interruption protocol." It turns out that current IP technologies have decreased costs in all areas, especially when one talks about the media backbone, where dedicated links are too expensive and present little flexibility. Globo TV's METROETHERNET caught this wave and has implemented an IP gigabit backbone between its main facilities within Brazil. The concept is to leave service-oriented, point-to-point links and move toward a multiservice, networked environment, in which all TV services, from live video contribution to offline content server transfers, could use the backbone resources dynamically with reliability and intelligence.

Dense wavelength-division multiplexing links between sites guarantee QoS requirements and provide for bandwidth upgrades. In this first stage, links vary from 1Gb/s to 2.5Gb/s, but they are ready to go up to 40Gb/s. Telecom operator Intelig was chosen to provide this redundant optical backbone at this stage of the project, but others will be included for the backbone's evolution. At each end, there is an optical converter to Ethernet frames. On top of the transport structure, Cisco ASR 9006 routers were installed to provide a multiprotocol label-switching (MPLS) core. By using MPLS, online video services are provided with fast convergence and low latency/jitter metrics, because offline noncritical services balance their traffic through all connected links. Other lower-priority services, such as Web publishing, content editing and Internet provisioning, fill the remaining bandwidth available inside the MPLS-TE tunnels.

One service that has seen great benefits is live video contribution. On former asynchronous transfer mode links, video encoders had to be assigned to decoders, one by one, by unicast. By using multicast on top of the MPLS network, different sites could receive the same content provided by the main headend, consuming less payload on the network and reducing the needs for encoder/decoder pairs. Also, because of this high-capacity network, Globo TV is considering the implementation of JPEG 2000 technology to improve quality and reduce latency for live events.

In light of this new backbone, service level agreements with internal clients have improved, and because the network is configured to be redundant, there is no single point of failure. At each site, there are two edge routers working in failover condition, and all services have been configured with redundancy, respecting their priorities on the queue. Monitoring is accomplished with Cisco's Active Network Abstraction (ANA), which creates a virtualization of all network elements on the backbone and gives the operation/support engineers full control of what's happening in the physical and logical layers, with different levels of information. From port failure to VRF and VPN analysis, the system in monitored to avoid service interruption.

Compared to previous links, the METROETHERNET project has increased link capacity at least 20 times with 40 percent less monthly expenses. The new carrier Ethernet-class backbone has increased productivity while bringing Globo TV sites to a new level of connectivity in an IP environment. ■

Design team

Globo.com: Armênio Lobato, tech. advisor; Maurício Kilikrates, tech. advisor
Globo TV: Marcelo Souza, proj. mgmt.; Júlio Limo, proj. mgmt.; Evaldo Jesus, Álvaro Antelo, Diego Ramos, Abílio Simão, Thiago Abreu, Robson Raiol, Marcelo Miguel, Edson Moura, Marcos Nishioka, Frederico Pereira, Ricardo Muniz, Cláudio Sousa and Luis Loureiro: network design.; Ana Eliza Faria e Silva, gen. mgr.; Luiz Carlos Abrahão, gen. mgr.; Josemar Cruz, gen. mgr.; Carlos Fini, gen. mgr.; Fernando Wiktor, gen. mgr.

Technology at work

Cisco: ASR 9006 aggregation service router, 3560 catalyst switches, ANA network infrastructure manager, UCS C-Series servers
Evertz: Fiber-optic gigabit modules
Huawei: Telecom operator DWDM transceivers
Nevion: Fiber-optic gigabit modules
Panduit: Fiber and Cat 6 cabling
Rosenberger: Fiber and Cat 6 cabling

Ohio News Network

Excellence Award category

New studio technology — network

Submitted by

Haivision Network Video

Design team

WBNS/ONN: Patrick Ingram, dir. of eng.; Jamie Caldwell, IT manager; Joshua Kapsch, IT proj. lead and developer for IP delivery; Jason Knapp, eng. IT remote systems installation

Technology at work

Bluemile: Dedicated Internet access, primary X/O backup, enterprise cloud services
Dell: Computers
Enseo: Decoders
Haivision Network Video: Barracuda encoders
Wyse: C90LE Thin Client-C7
Zixi: Feeder, Media Broadcaster

WBNS-TV serves central Ohio, providing Columbus-area breaking news, weather, traffic and sports coverage. For 15 years, the station's Ohio News Network (ONN) division used satellite delivery to contribute content to 16 cable headends in Ohio and surrounding areas. While this was a reliable model, it was an expensive solution — and one that had grown significantly more costly in the past couple of years. Looking to reduce the operational costs of contributing content without forcing employees, partners and customers to change the way they work from day to day and without compromising video quality, ONN decided to go IP.

Today, ONN uses the Haivision Barracuda H.264 encoder with the Zixi Media Broadcaster for cost-effective video contribution to cable headends across the region. The pairing of Haivision's advanced encoding technology with the Zixi platform in a turnkey solution has enabled ONN to shift from costly satellite contribution to high-speed IP video delivery over the public Internet without otherwise altering its working environment or processes.

Video from the ONN studio is encoded by two Barracuda encoders (the second encoder is used to feed the backup encoding system), groomed by the Zixi Feeder and sent over a 10Mb/s circuit to a Bluemile cloud-based hosting platform supporting the Zixi Broadcaster. Bluemile multicasts the Zixi output over the public Internet to Wyse thin clients installed at each of the 16 headend locations. There, the stream is processed by an Enseo decoder, which provides the appropriate video output for cable broadcast.

This new solution boasts low packet loss and extremely low jitter while providing 24/7 performance, which WBNS/ONN engineers can manage and monitor through the platform's intuitive interface. To keep bandwidth requirements low while applying robust forward error correction (FEC), ONN has set an eight-second delay for the system. As a result, just 3Mb/s is required per cable site, and, at that rate, the combination of advanced H.264 encoding, FEC processing and the broadcaster's move away from its analog uplink yields better video quality over the public Internet than ONN achieved over a 9Mb/s satellite feed.

ONN was able to install this new IP solution with complete transparency, and the engineering team finished the job over an eight-day period — much shorter than the two months required for the older satellite system and infrastructure. In implementing this IP-based contribution model, ONN also eliminated the time and cost spent maintaining aging satellite receivers at cable headends; now, the company's engineers can address equipment issues from their desktops and even their iPhones. Going forward, the station can easily expand the system to add channels or extend high-quality video to additional headends.

The installation at ONN demonstrates how, in the face of tough budget challenges, broadcasters can very simply employ advanced encoding and delivery solutions to realize significant cost savings with virtually no impact on operations or video quality. ■

RT

Excellence Award category

New studio technology – network

Submitted by

Azzurro Systems Integration

RT, an international provider of broadcast programming, has captured an expanding audience with its 24/7 English language news, cultural and social outlet available in more than 100 countries. Launched in 2005, RT's popularity led to the 2009 launch of its Washington, D.C., bureau. After settling in, RT concluded that the 12-year-old facility needed a physical and technical overhaul. Working with Azzurro Systems Integration, RT devised a plan to replace antiquated analog and first-generation digital technology with a future-proof and HD-ready serial digital infrastructure with embedded audio. The resulting design comprises two new studios and control rooms, ENG capabilities and editing tools.

The file-based workflow is built around Dalet Enterprise Edition newsroom, automation and MAM solution. NRCS, ingest, editing and playout are integrated with an Omneon Spectrum server and Autoscript on-air prompters, providing a story-centric approach to news production. Dalet also interfaces with RT Moscow for content sharing between locations. Programming created in D.C. is transported over Ethernet to Russia via TANDBERG H.264 encoders, where they are integrated in master control and returned to the United States. MAM tracks all digital workflows within the facility and maintains a point of control for production requirements. A Sun StorageTek LTO tape-based archive provides protection and long-term storage of core media assets. Front Porch Digital's DIVArchive manages media to and from the archive.

The two new studios each contain a 103in Panasonic plasma panel. Studio One's display incorporates a U-Touch touch-screen overlay, allowing a FingerWorks Telestrator to be used for on-air points. Twelve Planar Clarity Margay II rear-projection DLP cubes create a 90in x 160in stacked display with an ICS VW processor. Both studios feature Ikegami HDK-79EXIII SD/HD cameras with Fujinon lenses mounted on Vinten Osprey pedestals. Remote camera operation is achieved using Shotoku TG-18 robotic pan and tilt heads.

Two new digital control rooms center around a Grass Valley Kayak HD300 video production switcher capable of SD and HD operation for easy transitioning to full HD. An Encore control system drives a 256 x 256 Grass Valley Trinix SD/HD router that serves as the facility's core router. Monitoring is via Evertz VIP-X multiviewers. Displays can remain static or accommodate changing needs. An RTS Cronus intercom system integrates both IFB and facility communications. A Lawo Nova 17 audio router is connected to a Zircon XL audio mixing console in each room and the intercom.

Both control rooms share six channels of Vizrt news graphics with a Viz Content Pilot for each. Content connects to Moscow's system via a graphics server, allowing elements to be shared for an efficient graphics workflow expandable across all of RT's bureaus. When used in conjunction with the automation, the system can integrate digital graphics into a live environment.

Six Sony XD camcorders with PDW-700 recorder playback decks fulfill ENG needs. The cameras can ingest native digital clips directly to server storage or perform real-time ingest to FCP workstations located in five edit suites. ■

Design team

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

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

Technology at work

Apple: Final Cut Pro
Autoscript: TFT17HB-BLW prompters
Dalet: Enterprise Edition automation, MediaCutter editing module
Evertz: VIP-X multiviewer
FingerWorks: Telestrator
Fujinon: ZA17x7.6BZD, ZA12X4.5BZD and ZA17X7.6BERM lenses
Grass Valley: Kayak HD 300 production switcher, Trinix routing switcher
Harris: Videotek VTM-4100 waveform monitors
Ikegami: HDK-79EXII ENG HD cameras
Jimmy Jab: Extension
Lawo: Nova 17 matrix controller, ZirconXL audio mixing console
Lectrosonics: IFBT4 wireless base station, IFBR1A beltpack IFB receivers
Omneon: Spectrum media server
NetApp: Servers
Panasonic: TH-103PF10UL plasma
Planar: Clarity Margay II DLP displays
Samsung: LN65B650X1FX monitors
Shotoku: TG-18 pan and tilt heads
Sony: PDW-700 camcorders, XDCAM recorders
Sun StorageTek: LTO archive
Telestrator: Presentation software
U-Touch: 103/OS 103 touch screen
Vinten: Osprey pedestals
Vizrt: Artist graphics, Viz Trio graphics

The Golf Channel

Excellence Award category

New studio technology – network

Submitted by

Avid

Design team

Avid: Jeff Miller, solutions architect; Owen Welch, sr. principal customer success; Jim Leys, dir. studios and cable networks; Michael Harris, cable networks account mgr.
Golf Channel: Ken Botelho, sr. dir. of eng.; Roger Hastings, broadcast IT sys. eng. supervisor; Brian Gormley, broadcast IT sys. eng.

Technology at work

Avid: AirSpeed Multi Stream server, iNEWS newsroom computer system, iNEWS Instinct, Interplay Assist; Interplay Archive, Interplay production and asset management, ISIS 7000 storage, Media Composer editing
Dixon: Logging and search solutions
Front Porch Digital: DIVA Director, SAMMA Robot, SAMMA Solo
Harris: Archive server system
NLTEK: Interfaces
Sony: Petasite, XDCAMHD

Broadcasting since 1996, The Golf Channel is the nonstop shop for golf on cable. Recently, it installed a fully-integrated, Avid Interplay-based workflow to provide virtually unlimited access to its media and move to an HD format. The new workflow allows contributors to go from ingest to editing, pass material to the audio suite for sweetening, and then pass it back again so that it can be mirrored together and sent for playout. It provides metadata management, making all the various pieces involved in the production chain visible. Editors and producers can now log directly into the system and see everything reflected across the various platforms.

Interplay is the cornerstone of the system, providing an unparalleled level of collaborative capability. Previously, the channel was using Media Manager. But the advent of Interplay enabled the channel to make its move to HD while enabling contributors to increase control over the way media was separated, narrow searches more adroitly and see everything that was on the system.

Other companies had elements of what Interplay offered, such as media management or ingest functions, but were not fully integrated into true end-to-end solutions. Today, Golf Channel uses an Avid iNEWS newsroom computer system to schedule and develop the show scripts and is even getting to the point of being able to use it for automation as well. Working in conjunction with Interplay Assist and Instinct, the workflow gives contributors the tools necessary to build what they want before even getting to edit.

Interplay also provides seamless integration with third-party technologies, including Analtech, Front Porch and EDS. Analtech handles XDCAM ingest functions, allowing the channel to take all the metadata currently on XDCAM disks and integrate that directly into the system.

The installation took place in three parts. First, storage was moved over to ISIS, then AirSpeed Multi Streams were introduced to handle HD playout, and finally, an Interplay system was brought in for testing on a single show. Gaining confidence in the efficacy of all these systems, the channel went on to integrate Assists, Instinct clients and everything else throughout the facility.

Having this level of workflow capability is essential to the channel's growth and ability to maintain industry dominance. Since 99 percent of everything done in-house is with Avid, producers, editors and managers of various departments need direct visibility into the production process. Now, instead of seeing their work as a separate unit, each contributor has become more integral to the production process. It has empowered everyone to take a major step away from linear thinking, approach work in a nonlinear way and make the most of media by simply working better together.

Golf Channel currently broadcasts PGA Tournaments every Thursday and Friday that PGA plays and maintains coverage of the LPGA and the Champion's Tour. As the channel expands its presence, footage coming in multiplies exponentially. Thus, it is the ability to turn that media into digital form, get it into the archive systems and make it easily accessible to everyone that is fast becoming the single most important element of the facility's IT systems.

Virgin Media

Excellence Award category

New studio technology – network

Submitted by

Bridge Technologies

In 2006, Virgin Media began a project to plan and implement a new digital broadcast TV infrastructure to replace the legacy infrastructure inherited from the amalgamation of three other providers. The project aims were to upgrade this legacy infrastructure with a system that would use reliable new technology and to create a platform for growth in SD and HD channels, while reducing costs arising from service level agreements (SLAs) and operations. To meet the key goals of reducing costs from SLA penalties and infrastructure maintenance, and providing substantially improved quality of service to the subscriber base, Virgin Media's project architects implemented an unprecedented level of monitoring and diagnostic capability.

The new network infrastructure rationalized the broadcaster's delivery chain, introducing IP technologies at all stages, and deployed a monitoring system from Bridge Technologies. The new system delivers end-to-end diagnostic and monitoring capability to Virgin Media staff, who can access, view and interrogate any point in the delivery chain, from any remote Web-enabled location. The delivery architecture is based on a single central headend, a hot-synchronized disaster recovery headend, a core IP network, a unified conditional-access environment and a redundant network architecture that would allow the 54 regional headends to continue service in the event of a failure.

The VideoBRIDGE system provides the critical requirement of 24/7 remote analysis of every point in the delivery chain, combining not only monitoring of equipment status, but also of QoS. The system delivers detailed real-time monitoring of data using the ETSI ETR 290 parameters for measurement of DVB satellite, cable and terrestrial, and related digital television systems, and combines it with accurate real-time data on key IP performance and integrity measures, to provide a unified monitoring and analysis environment. The vast amounts of data generated by the system are gathered into easily readable graphic displays that give engineers the ability to monitor hundreds of channels efficiently at a glance. Instead of spreadsheet-like grids of numerical data and banks of monitoring screens, engineers see color-coded, real-time status indicators that provide an instant overview of the entire service gathered onto a single screen, and a potential problem anywhere in the infrastructure is immediately obvious. If performance tested against any parameter causes concern, the system generates an alarm, and the engineer can immediately click on the link to displays of more detailed data that can pinpoint the cause.

The benefits have amounted to significant improvements in the operation. These include reduced fault investigation times resulting from the ability to pinpoint any fault on the network within minutes. Reduced callout costs are combined with a 99.98-percent QoS fulfilment. An additional benefit is the ability to identify deficiencies in content quality from suppliers and apply pressure for improvement by delivering detailed, accurate data in support of SLA negotiations. This new end-to-end monitoring capability will continue to improve service availability and QoS to customers, leading to increased penetration and the ability to expand and bring new channels to air.

Design team

Virgin Media: Alistair Crook, head of TV ops.; Keith Wigmore, technical sponsor; Dave Wright, broadcast ops. specialist

Bridge Technologies: Rolf Ollmar, CEO; Frank A. Ekern, sr. developer; Nils J. Zapffe, head of development

Technology at work

Bridge Technologies: VideoBRIDGE VB120 broadcast IP probe, VB220 IP probe, VB270 DVB-S/S2 input probe, VB12 portable broadcast IP probe, VB280 content extractor, VBC server, microVB miniature STB probe

ABC's central switching center

Excellence Award category

New studio technology – HD

Submitted by

Disney/ABC

Photo courtesy Andy Washnik

Design team

ABC: Ken Michel, VP of eng.; Chris Bauer, dir. of eng.; Phil Durante, dir. technical construction; Steve Machanic, mgr. of special proj.; Scott Pierce, sr. sys. eng.; Adel Youssef, GM broadcast network engineering; Arkady Shenker, mgr. broadcast computer sys.; Mike Strein; dir. equipment planning and sustaining eng.; Jay Ballard; proj. mgr. technology strategic planning

The Systems Group: Paul Rogalinski, proj. mgr.; Jared Miller, sr. eng.; Rachel Pomerantz, sys. eng.; Matt Marino, proj. supervisor

Technology at work

ADC: NGF, OMX fiber infrastructure and jackfields

Avocent: HMX KVM routing

Barco: RHDM-2301 line monitors

Cisco: 6507 routers

Evertz: 3405 optical splitters, 3405 SFP DAs, EQX routing

Harris: 6800+ up/downconversion

Linear Acoustic: LAMBDA II audio monitors

Miranda: iControl, KX monitoring, RCP-200 control panels, XVP3901 frame syncs

Ross Video: DMX 6259A fiber output audio de-embedders, Mux 6258A fiber input audio embedders

Sony: LCD monitors

Tektronix: WFM8300 monitors and rasterizers

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

To support 3Gb/s reliably throughout a geographically diverse campus, a fiber-optic infrastructure was designed and installed throughout the CSC equipment room and the entire ABC plant. Advanced routing control built on a dynamic tie-line allocation scheme between a new central core router and existing satellite routers was developed. A new transmission operations center with integrated monitoring and advanced processing control was constructed.

The fiber plant is all single-mode and is managed with ADC fiber infrastructure components. Optical splitters functionally replace DAs, with every active fiber port connected to Evertz 1 x 4 or 1 x 2 optical splitters to provide signal copies as required. Each splitter was designed with a low power output that lands on fiber jackfields to provide optical test points for troubleshooting. To maintain a reliable margin in the optical link budget, splitters are not cascaded, ribbon fiber cable is fusion spliced throughout, and fiber patching was kept to a minimum. All fiber cross connect cables use APC ends with LC connectors. SFP technology is employed for equipment inputs and outputs.

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

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

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

Conan O'Brien production facilities

Excellence Award category

New studio technology — HD

Submitted by

NEP Broadcasting

In the early summer of 2010, NEP Broadcasting's Denali division was asked to build the production facilities for the new Conan O'Brien show, "Conan." It was an exciting project to bid on, but the location for the production had not been selected beyond the West Coast. Bids were due the middle of June, the award would be announced at the end of June, and the show would debut on TBS the first week of November. That left just 120 days to design and build the new production facilities.

Fortunately, the location decision came rather quickly: the Warner Brothers Lot, Stage 15. Unfortunately, there was no space on the soundstage for the technical facilities. The solution, conceived by the show's project manager, David Crivelli, was to build seven custom office trailers married together to create spaces for production, audio, sound effects, graphics, edit bays, music mix, video, recording and core systems. But the next big issue was that the trailers would not be manufactured, delivered and set up until after Labor Day. This left NEP less than 45 days before rehearsals began to finish the build.

Fortunately, much of the creative and technical crew had worked on O'Brien's previous show, so issues of workflow and preferred equipment had been resolved. Crivelli made the decision to split up the various parts among three vendors: Key Code Media would handle editing and SAN storage; Soundwise would tackle production audio, music, sound effects and house PA; and NEP was tasked with the remainder, which consisted of production, recording, graphics, video, communications and core systems.

NEP immediately made the decision to prebuild at its systems integration facility in Pittsburgh. This would allow construction to begin before the trailers were in place. Twenty racks of equipment, consoles and the production monitor wall were assembled and wired in Pittsburgh in late August. Just after Labor Day, two 53ft tractor-trailers made the cross-country trek to Warner Brothers.

NEP began the load-in on Friday at 6 a.m., and by the end of the day Friday, all systems were in place. Only three days later, systems were wired together and ready for testing and configuration. This included pulling in all the cables to the stage via new conduits under the road between the building and trailers.

With close coordination and teamwork, the show has a new, spacious facility to rival any installation in the Los Angeles area. Once inside, you'd never know 45 days earlier it was just an empty parking lot.

Design team

"Conan:" David Crivelli, proj. mgr.
NEP Denali: George Hoover and Kevin Hayes, proj. mgrs.
NEP Engineering: Frank Rainey and Tim Kubit, engs. in charge
NEP Systems Integration: Howard Naugle, Terry Kulchar and Michael Naugle, sys. design.; Scott Chaffo and John Fortunato, super. fabrication and install.

Technology at work

Apple: Final Cut Pro editing
Canon: Lenses
Evertz: Distribution, frame syncs, sync systems, multiviewers
FOR-A: FA-9500 frame syncs
Grass Valley: Encore routing control, K2 Summit servers, SAN, Trinix HD video router with embedded audio
Iconix: POV cameras
Ikegami: Monitors
NEC: Monitors
RTS: ADAM intercom system
Sony: HDC 1500 cameras, monitors, MVS-8000G production switcher, XDCAM recorders
Studer: Vista 8 and Vista 9 consoles
TV Logic: Monitors
Vinten: Pedestals, camera heads

C-SPAN

Excellence Award category

New studio technology – HD

Submitted by

Ascent Media Systems Integration

Design team

Ascent Media: Steve Vitale, proj. mgr.; John Ciulla, sr. design eng.; Aaron Stevens, proj. leader
C-SPAN: Roxane Kerr, VP technology; Richard Fleeson, chief eng.

Technology at work

Crispin: RapidPlay X broadcast automation
Grass Valley: Concerto HD router, Encore control system, Maestro HD MC switcher, modular gear
Harris: X50 and X85 frame syncs
Miranda: Kaleido-X multi-image processor
Motorola: Digicipher HD encoders
Samsung: UN55B7000 55in LED displays

C-SPAN, the Cable-Satellite Public Access Network, is tasked with providing the general public with access to the political process. The primary means by which this objective is achieved is by providing live gavel-to-gavel coverage of the proceedings of the House of Representatives and United States Senate on the C-SPAN and C-SPAN2 cable television channels, respectively. In the past few years, both the House and Senate have upgraded their internal broadcast systems to HD. This availability of the proceedings in HD coincided with C-SPAN's long-term HD initiative, and in late 2009, C-SPAN began the process of transitioning its operation to HD by upgrading the master control rooms for C-SPAN and C-SPAN2.

Ascent Media Systems Integration was contracted to do the design and integration work for this exciting project. The most challenging aspect of the design was in creating a new HD island that would operate seamlessly in the existing SD facility and do so in a fashion that would allow the HD capabilities of C-SPAN to grow over time — a challenge faced by many broadcasters today. The elegant technical solution was built around a new 64 x 64 Grass Valley Concerto HD router and Encore control system and a pair of Grass Valley Maestro master control switchers. Native HD sources were brought directly into the Concerto frames while decoder ports on C-SPAN's Profile video servers were upconverted by Harris X85 frame syncs and also fed to the Concerto. Other SD sources were brought to the Concerto via tie lines from the legacy SD router. These tie lines were managed by the Encore system, and X85s were placed in their path to perform the SD-to-HD conversion. The HD outputs of the room were fed to new Motorola Digicipher HD encoders and also passed through Harris X50 frame syncs to perform the downconversion to SD to feed the legacy router and transmission systems.

Due to the many live aspects of C-SPAN's programming, C-SPAN and C-SPAN2 operate from independent master control rooms. The Maestro switchers enhanced the overall functionality of these rooms, but other major components, which had been proven through years of use at C-SPAN, were kept in place. The existing Crispin RapidPlay X automation system was developed to allow it to exploit the advanced keying and DVE features available in the Maestro. Existing HD-capable Chyron Duet LEX CGs were also reused and supplemented with new units, giving each room four channels of graphics capability. Physically, both rooms were completely rebuilt from the ground up and now feature monitor walls comprised of four Samsung 55in LED displays, fed by a Miranda Kaleido-X display processor.

Based partially on the success of the first two rooms, the control room used for the C-SPAN3 channel was also upgraded to HD. A second Concerto router, another channel of Maestro and another Kaleido-X system were required to support the third room. These were integrated with the existing systems where needed, and the entire upgrade process for this room, including the physical refit, was performed in roughly six weeks time.

ESPN Star Sports

Excellence Award category

New studio technology — HD

Submitted by

Omneon

ESPN Star Sports (ESS) operates 17 networks in five languages throughout Asia, handling live broadcasts of local and international sporting events and producing five local editions of "SportsCenter." As ESS approached the launch of HD broadcasts, it took a new approach to media asset management — one that would enable rapid marking, editing and localization of content within a highly efficient file-based workflow.

A new file-based HD production system engineered and delivered by systems integrator TSL, along with Omneon, IBIS and IPV, was taken online on July 1, 2010, just under six months from the initial project order — and just in time for the 2010-2011 English Premier League season. A robust media processing and storage platform from Omneon includes a 100TB Omneon MediaGrid active storage system with 3000 hours of capacity and full data replication, four Omneon Spectrum media servers that support ingest with 25 recording ports and 2500 hours of total capacity, and four additional Spectrum servers with total capacity of 1300 hours to support playout of 26 on-air channels.

Recording sessions are scheduled in advance through the IBIS iAcquire Scheduler application, which triggers the recording and ingest of live video from the studio or satellite downlink by Spectrum systems. In parallel with ingest, incoming material is transcoded by IPV hardware and middleware to low bit rates for browse purposes. During the event, as material is ingested, operators at IBIS iLogger workstations can tag the incoming sports events with appropriate, validated metadata, which is linked to media throughout its editorial life cycle.

ESS staff then can use IBIS iFind, which enables media searches across all broadcast devices through a Web client, to locate key moments, key players and combinations thereof, and quickly create rough cut edits and export an EDL to FCP. FCP carries out an edit-in-place on the MediaGrid, publishing the highlight clip to a watch folder from where IBIS iMove picks up the clip and directs it to the on-air Spectrum server. The workflow includes access to the ESS Clip Naming Convention via an IBIS plug-in on FCP so that there is no danger of the clip being named incorrectly. Once the highlight clip hits the server, IBIS initiates the creation of a browse copy of that edit from iPC XCode. This clip is then available to everyone else using the iFind MAM Web client. The completed highlight clip is pushed to the Harris playout automation system by IBIS, which ensures that the correct clip gets to the correct place in the rundown.

The "active transfer" capability of the connected MediaGrid encodes incoming video into standard IMX 30Mb/s MPEG-2 format and wraps it in a QuickTime wrapper so that editors using FCP software can open and edit a "growing file" on the MediaGrid just two minutes after ingest begins and produce highlights for immediate playout. The MediaGrid works with Harris automation, and IBIS asset management routes language tracks in the server file to the correct market. Today at ESS, real-time metadata tagging, the active transfer of event footage and the automated insertion of multilanguage commentary enable the fast turnaround of live sports event broadcasts for viewers.

Design team

ESPN Star Sports: Chua Tiong Hou
IBIS: John Haselwood, CTO; Andrew Johnston, dev. mgr.; Nigel Jackson, op. mgr.; Susan Georgiades, proj. mgr.; Eric Collinson, proj. mgr.; Nigel Booth, iPV browse creation
Omneon Singapore: Chew Kok On, Elson Soong, Loh Cheng Song, Terry Spittle
TSL

Technology at work

Harris: Automation
IBIS: iAcquire, iFind Media Asset Management, iLogger, iMove
Omneon: MediaGrid active storage system, Spectrum media servers
Pilat: Scheduling

KTBS-TV

Excellence Award category

New studio technology – HD

Submitted by

Avid

Design team

Audience Research & Development: Jerry Gumbert, president
Avid: Chad Rounsavall, key enterprise account exec.; Steve Janey, solutions architect; Robert Murphy, proj. mgr.; Mike Zweig, professional services consultant
KTBS-TV: George Sirven, station mgr.; Dale Cassidy, chief eng.; Randy Bain, news dir.

Technology at work

Avid: AirSpeed Multi Stream server, DS finishing, FastBreak automation, iNEWS newsroom computer system, ISIS 7000 storage, Interplay production and asset management, Media Composer editing, NewsCutter editing
Evertz: Audio embedders, upconverters, downconverters, trilevel sync generators, closed-caption encoder box
Grass Valley: Fusion, Ignite
Sony: PMW-350K camcorders and studio cameras, PWM-EX3 camcorders
Vinten: Robotic pedestals

KTBS-TV and KPXJ-TV, the locally-owned, ABC/CW affiliate duopoly in Shreveport, LA, airs five-and-a-half hours of weekday news, four hours per day on the weekend, two hours daily for its CW affiliate, and a news website constantly fed with updated stories as they happen. Growing demand for this amount of content across multiple channels prompted KTBS to re-engineer its newsroom and become the first full station in its market to go all HD. The move began five years ago when the station upgraded its master control facilities with Avid FastBreak automation to ingest and play out HD syndicated shows and commercials.

Following its DTV transition in June 2009, the station decided to turn its newsroom and production department into full HD and tapeless environments. During this time, though, the economic climate took a downturn, forcing KTBS to take a harder look at how HD news production technology could also help it do more with less while still improving the quality and quantity of its news to feed all of its channels. Working with Avid and technology consultant Audience Research & Development, the station created a plan based on transforming the traditional reporter, photographer and editor team into a single multimedia journalist (MMJ) that could shoot, write, edit and send a story back to the station, where it could be moved seamlessly across departments. The key selection mandate was for systems that could work well together. KTBS chose Avid as the foundation for its new tapeless, HD workflow based on an array of technology, including: ISIS 7000 shared storage, Interplay production asset management system, iNEWS newsroom computer system, Media Composer and NewsCutter editing systems, AirSpeed Multi Stream ingest and playout server, DS finishing software, and FastBreak automation. The facility also includes equipment from Sony, Grass Valley, Vinten and Evertz.

The move to the MMJ model has enabled KTBS to put three times the number of reporters on the street to cover news and allowed each of them to bring more information to viewers faster. MMJs use Media Composer software loaded on Dell laptops for editing. Craft editors use DS, while the station's promotions department uses Media Composer. Content contributed from the field can be made available immediately to news producers, journalists responsible for the station's Web channels and the promotions department through Interplay. This saves considerable amounts of time while enabling more content to be generated from each story. With a new shared storage system, MMJs now shoot, write and edit finished pieces, giving producers a number of stories from which to choose when deciding what to put on-air.

Interplay archiving enables KTBS to search and find media quicker and easier. This increased visibility and access to information, along with the ability to attach associated metadata, helps speed up the process of finding, accessing and using footage for a variety of purposes. This new workflow allows the station to do more with less, transforming how it creates news and the quality of programming it can provide. Viewers get better, more comprehensive news coverage while KTBS increases ratings and better serves the community.

KWWL-TV

Excellence Award category

New studio technology — HD

Submitted by

Ross Video

In 2009, KWWL-TV, the primary NBC affiliate for the northeastern third of the state of Iowa (DMA 88), was in need of a total technology refresh in order to compete for leadership in the market. KWWL began the research process to design a completely new and independent facility that was fully HD, and would employ a current news production workflow. The new facility would be 50ft away from the original control room and would become part of its news set.

The design of the physical facility turned out to be a pretty simple process for KWWL. The original layout was cramped and poorly laid out, so the station worked directly with local contractors and developed a more logical and efficient design. With the construction of the new facility under way, it was time to invest in updated news production gear.

The timing of this project fell into place since HD video equipment was evolving and becoming more affordable, and KWWL was experiencing a strong need to update all of its old, analog equipment.

Working with systems integrator Roscor, KWWL had only five months but managed to build a new control room, install new equipment, create a graphics package, train its entire staff and rebrand the station. Everyone in the facility pulled together, putting all the equipment and elements into action. In order to perfect their newscasts, the team would run through them twice. They would begin their newscast by going on-air using the old control room, equipment and graphics, and follow up with a practice run using the new control room. Everyone was on hand adjusting lights, moving equipment and marking camera positions. KWWL staff pulled together through long days, but the preparation and final outcome was worth it.

At the heart of the new automated facility is a Ross Video OverDrive automated production control system. OverDrive interfaces with the station's new Ross Vision 2 MLE video production switcher, XPression character generator and motion graphics system, Yamaha audio mixer, and Panasonic robotic studio cameras. The interface ability among these diverse products was essential to the success of each and every broadcast. The changes in HD equipment caused a dramatic improvement in workflow, allowing KWWL to work more efficiently and to repurpose staff accordingly.

On April 11 of this year, KWWL became the first station in the Cedar Rapids, IA, market and the first Quincy Newspapers station to broadcast in HD. There's a new visual look and feel to KWWL's newscasts, including HD weather maps and graphics to enhance the experience for viewers and advance the station's product. On an abbreviated timeline, from research process to end result, KWWL now has more capability and no limitations in its competitive Iowa market.

Design team

KWWL-TV: Jarrett Liddicoat
Quincy Newspapers: Brendan Ford, Brady Dreasler
Roscor: Chad Thielen, Tom Sibenaller
Ross Video: Chris Kelly, Dave Halvorsen

Technology at work

AJA Video Systems
Panasonic: Robotic studio cameras
Ross Video: Vision production switcher, OverDrive automated production control system, XPression character generator and motion graphics system
Telemetrics: Camera control system
Yamaha: Audio mixer

MTV Times Square Studios

Excellence Award category

New studio technology – HD

Submitted by

Broadcast Integration Services

Design team

Broadcast Integration Services: Joseph Policastro, proj. mgr.; Kevin Henneman, technology mgr., Adam Semcken, sr. design eng.; Andy Morris, eng.; Robert Gilmartin, eng.; Judi Southard, logistics; Chris Butler, integration supervisor; William Frederick, lead tech.
Callison: Neil Tucker, architect
MTV Networks: Mike Bivona, VP of eng.; Jim Brizzolara, eng. production technologies; Bill Anchelowitz, dir. proj. management; Tyler Marinello, content creation support technician; Thayne Knop, dir. of content creation technologies; Adrienne Bonfrisco, production technologies

Technology at work

ADC: Video and audio patching
Avid: ISIS storage, Nitris editing
Evertz: EQX multiformat router, VIP-X multiviewer, VistaLINK SNMP monitoring, test signal generation and timing equipment
EVS: Video server
Genelec: Speakers and loudspeaker manager software
Gepco: Fiber systems
Image Video: Tally
Joseph Electronics: Fiber systems
Linear Acoustic: 5.1 monitoring
Middle Atlantic: Equipment racks
QTV: Teleprompter
RTS: Intercom
Sony: HDC1500 cameras, HDCAM SRW-5800 tape playback, displays
SSL: C100 HDS audio mixer
TBC: Broadcast consoles
Tektronix: Test and measurement gear
Telemetrics: Roof camera robotics
Vinten: Studio pedestals
Wohler: Audio monitoring

In June 2010, major broadcaster Viacom-MTVN hired Broadcast Integration Services (BIS) to provide turnkey systems integration for its new state-of-the-art production facility located in Times Square New York City. Working with the MTV engineering team led by Mike Bivona, BIS delivered a design capable of supporting HD video and multichannel audio with a strong vision for dealing with space limitations, heat generation and associated cooling requirements.

BIS project management and engineering, in cooperation with MTVN engineering, was tasked with providing an end-to-end solution, including a complete rebuild of the studio facilities with support for a combination of 14 studio and handheld cameras, as well as point-of-view rooftop cameras overlooking Broadway and Times Square, while providing support for 5.1 audio production mixing, recording and editing capabilities. The system was designed and installed to allow for mixing and routing of any available audio sources and groups, enabling isolated recorded feeds of all cameras with virtually unlimited combinations of audio tracks and video sources. To further enhance the production capabilities, an Avid ISIS storage area network integrated with EVS XT[2] server and IP Director technology was employed. This allows for ingest and low-resolution review of media from either the playback area in the studio facility located on the concourse level or from local videotape recorders attached to individual Avid edit suites and producer offices and workstations situated on various floors throughout the building. With the upgrade to HD video and embedded multichannel audio as the core production format, various peripheral subsystems were in need of modifications and improvements as well, and BIS provided integrated solutions for transmission and monitoring systems, allowing for a complete integration package from acquisition, production, post production and editing to transmission and profanity delay implementation.

BIS and MTV used cutting-edge technology such as onboard processing and fiber-optic and network connectivity for subsystems like production routing, audio mixing and intercom communications. Multiplexing typically handled by multiple trays of outboard devices and cabling with patching points were replaced with the latest technology from Evertz Microsystems and Solid State Logic, allowing BIS to integrate a common audio standard such as MADI with time division multiplexing (TDM), as well as embedders and de-embedders located in the router frame itself. This saved on rack space as well as reduced cooling and power requirements.

Operators can quickly and easily recall preset show configurations and setups to handle the myriad of audio pairing and grouping requirements as they arise from creative television production personnel. The combined efforts of MTV and BIS resulted in achieving a system that meets current and future operational requirements, lowers operating costs and adverse impact on the environment by reducing the amount of equipment and wiring necessary, and helping to reduce the capital investment required to fund the project. ■

NASCAR

Excellence Award category

New studio technology – HD

Submitted by

Communications Engineering, Inc.

NASCAR Media Group is a media, marketing and entertainment company that creates and produces programming related to the sport, manages its media partnerships, and forges relationships to integrate the sport into mainstream entertainment. As the internal production and creative services company of NASCAR, it is the exclusive rights holder of event footage, race data and content.

As part of a major relocation of the headquarters to a new office complex in Charlotte, NC, NASCAR Media Group wanted to build a new HD production center. Communications Engineering, Inc. (CEI) was brought in to handle the design and integration for the massive file-based facility, which features the latest wideband 3Gb/s HD processing and distribution technologies with TV studios, control rooms, editing suites and other production areas.

CEI was responsible for all aspects of the HD production center project, including complete design, equipment procurement, systems integration, installation, testing, training and overall project management, as well as elements of ongoing technical support.

The production center is part of the new NASCAR Plaza, located next to the NASCAR Hall of Fame. It occupies four floors of an office tower and two floors of the adjacent building, which contains a new television studio and production control room. Showtime uses the facility to tape and produce the one-hour "Inside NASCAR" program, which includes highlights, analysis and feature stories, as well as previews of upcoming races.

The project was especially challenging because the systems integration and installation had to be done in an active construction site, and much of the facility had to be ready for the first "Inside NASCAR" program and the start of race season. Complete testing of the 3Gb/s signal had to be conducted throughout the facility to ensure effective operations.

The facility also has a new HD international control room and post-production facility, which is used to broadcast races to international markets. The live feed of the race is customized for countries outside the United States and broadcast to those markets via satellite. The video is also captured and delivered to the new post-production area, where it is edited and used for upcoming programming. These activities previously were handled by mobile units located at the race track venues. The new system enables easier, more efficient management of the process while improving quality and reducing costs.

A radio production area includes two new radio control rooms featuring Wheatstone consoles. Each control room can accommodate six people, and one of the rooms is used by Sirius to produce its NASCAR channel.

In addition to the production center, CEI provided a media playroom, several conference rooms and custom A/V systems. A second studio, with HD audio and video control rooms, was completed in late 2010.

The on-time completion of the HD production center provides NASCAR with a future-proof facility that allows for the addition of even more capabilities and services. ■

Design team

CEI: Raef Alkhayat, dir. of eng.; Felix Pena, dir. of mechanical eng.; Tom Hackett, PM; Ruber Huertas, sr. design eng.

NASCAR Media Group: Steve Stum, managing dir. of field ops.; Stu Albert, managing dir. of broadcast ops.

Technology at work

Apple: Final Cut edit suites
Autoscript: LED teleprompters
Chyron: HyperX HD/SD character generator
Cobalt: 9084 HD/SD-SDI RGB color correctors
DNF Controls: 2044CL video controller
Evertz: Control panels, distribution amplifiers, multiviewer, router, timing equipment, VistaLINK frame controllers
Forecast: Consoles
Grass Valley: K2 servers, Kayenne and Kayak production switchers, HD fiber base stations, LDK8000 HD studio cameras
Harris: Digital signage equipment, routers, VTM-4100 multiformat, on-screen monitors
Lectrosonic: SMQV wireless microphone systems
NEC: LCD HD displays
Panasonic: Plasma display
Samsung: LCD monitors
Sony: HDTVs and HD LCD master monitors
SSL: Production console
TBC: Consoles
Tektronix: WFM7120 and WFM8300 waveform monitors
Wheatstone: Evolution 6 consoles
Wohler: Audio and video monitors

NBC

Excellence Award category

New studio technology — HD

Submitted by

Utah Scientific

Design team

NBC Universal: Larry Gaetano; Chris Whittington, eng; Joe Loebach, eng; Michael Benetato, eng. mgmt.; Wesley Scruggs, eng.; Susan Vitorovich, tech. mgmt.; Marsha Groome, tech. mgmt.; Chris Millar, broadcast IT; Sarah Greenberg, purchasing/coordination; Joe Shalhoup, audio eng.; Dave O'Brien, audio eng.; Mary Manby, video eng./cameras

Technology at work

ARKTX: Architectural engineering
Avid: Still store
Belden: Wire and cable
Calrec Audio: Audio console
Canon: Lenses
Chyron: Graphics
Evertz: Fiber transmission, HD JPEG transport, monitor wall, terminal gear
EVS: Playback units
Hopewell Precision: Racks
Image Video: Tally and UMD control
Joseph Electronics: Fiber cable infrastructure
RTS/Bosch: Intercom system
Sony: Cameras, monitors, switcher
Utah Scientific: MX-Lator Control Translation System, UCP control panels, UTAH-400/XL routing switcher

On May 2, 2010, "Meet the Press" debuted a new set, but the more important renovation at NBC's Washington, D.C., operation was behind the scenes — a streamlined, rationalized, cost-effective signal distribution infrastructure that relies on the innovative use of dark fiber connectivity and advanced digital routing technology.

The NBC operation in the capital's Tenleytown neighborhood receives and distributes the network's local and regional feeds, as well as those of the local O&O, WRC-TV. For MSNBC alone, the facility does four hours a day of live programming. Despite this workload, signal distribution had been a combination of SDI video and analog audio left over from an upgrade in the early '90s. The HD transition took about four months, with the eight-person engineering staff doing the work in-house. At its heart is a Utah Scientific UTAH-400/XL routing switcher configured 804 x 792 HD3G, and 60 x 108 fiber optic, the largest single router in the regional market. That router is networked with six smaller Utah Scientific routers — one each at the Pentagon, State Department and White House, and three at the Capitol. The system is NBC-wide because it also includes access to headquarters in New York.

Because the Washington, D.C., operation incorporates many remote locations, an important component was dark fiber-based communications. Previously, NBC had relied on services from a traditional communications provider. Now, NBC leases two strands of dark fiber, with capacity for as many as 20 services on each using CWDM. For example, there are 24 HD video circuits on two strands of fiber between Tenleytown and the Capitol. The two strands also carry IT and phone lines with a per-circuit monthly cost of less than 5 percent of what it had been from the traditional provider.

All circuits are managed by the main router and by Utah Scientific's MX-Lator Control Translation system, which coordinates feeds and allows the routers to talk to each other. There are, for example, 12 lines from the White House to the bureau, 16 from the Capitol, six from the Pentagon and seven from the State Department. Operationally, the system appears to be on a single router, and it can be represented on a single panel. NBC producers extensively use soft panels because they are so easy to deploy and update, and because they can be opened by several people at once. NBC relies on JPEG 2000 compressing to 120Mb going over two redundant 10Gig circuits to 40 New York destinations, and NBC Media Traffic Control in New York does all switching using soft panels.

To illustrate the benefits of the renovation, consider an everyday occurrence — moving a video feed from the White House North Lawn back to the bureau. This used to require five manual steps, including switching the router at the White House, switching the communications provider's router and switching the Washington BTS router that fed back to the communications provider. Now a camera plugs in, and the newsroom producer picks North Lawn One on the soft panel and sends it.

NBC Washington's new infrastructure not only saves money, but also it saves time and headaches for staff and results in greater consistency for viewers. ■

Outdoor Channel

Excellence Award category

New studio technology — HD

Submitted by

IEEI.TV

Now more than ever it is easy to sit back in the comfort of your home, and, with the click of a TV remote, see and hear the most beautiful hunting and fishing shows on TV. From fishing in the deep blue Pacific to hunting in the pristine Rocky Mountains, they all come alive in HD on the Outdoor Channel. Outdoor Channel, located in Temecula, CA, offers HD programming that captures the excitement of outdoor adventures and the Western lifestyle.

Outdoor Channel recently transformed its facility from a tape-based workflow to a file-based workflow; however, there were still pockets of operational inefficiency that needed to be addressed.

Enter IEEI.TV and Dennis Bress, president/CEO. "As solutions partner to Outdoor Channel, we were afforded the opportunity to install world-class, tested solutions like the scalable specialty media workflow storage platforms manufactured by Apace Systems," he said. "These storage servers are the heart of the digital media services platform at Outdoor Channel. Currently installed is 212TB of vStor for shared, real-time editing and eStor for online archive and production, editorial, QC and CC work in progress. This storage is NAS with GigE and 10GigE interfaces. The storage is seen by other key services like the Telestream Pipeline HD Dual video ingest system and the ever-important tool that all media companies can't live without anymore: the transcode farm."

Outdoor Channel's transcode farm was upgraded from FlipFactory to a pair of Telestream Vantage workflow automation servers. Vantage, with its easy-to-use workflow GUI and ability to automatically process multiple transcodes, provided the processing capabilities needed to support digital workflow across all departments. The redundant, dual-server configuration gives Outdoor Channel the security and comfort of knowing it has a fail-safe solution that will not suffer any delays in critical workflow. Coupled with Aspera for file delivery, Outdoor Channel is prepared to deliver any format, any time to anywhere.

For archive, the Vantage-transcoded Harris broadcast format, half the file size of the production format, is saved on the Apace NAS. In addition to size, another benefit to archiving the broadcast format is the easy reairing of this archived content with a simple mouse click.

In one week alone, 20 hours of manual labor were eliminated by pulling from the digital archive for reairing of shows. Immediate cost savings on VTR maintenance, tape stock and encoding service fees have contributed to a speedy ROI.

Design team

Apace Systems: Lee C. Hu, pres.; Jeanclaude Toma, exec. VP; Junroen "JayR" Elpedes, eng.; Andy Gorman, eng.
IEEI.TV: Dennis Bress, pres./CEO
Outdoor Channel: Paul Weaver, sr. dir. of eng.; Mike Kozdrey, mgr. of eng.; Robert Southward, sr. mgr. master control; Peter Chapman, sr. eng.; Robert Nicholson, sr. eng.; Brad Markham, sr. dir. post prod.; Brian Hamada, QC and CC mgr.
Telestream: Chuck Buelow, western regional mgr.; Greg Cox, field applications eng.

Technology at work

Apace Systems: eStor, vStor, postMAM with iPad interface
Aspera: Connect server
Telestream: Episode Pro, Pipeline HD Dual video capture, Vantage workflow automation

U.S. House of Representatives

Excellence Award category

New studio technology – HD

Submitted by

Ascent Media Systems Integration

Design team

Ascent Media: Scott Schmitt, design eng.; Richard Moore, network design; Michael Williams, design eng.; Patrick Jordan, proj. leader; Paul Ohodnicki, proj. mgr.

Technology at work

HRS HD studio: 1M/E HD production switcher, audio console, digital intercom matrix, HD cameras, HD CG, HD VTR, monitor wall, multiformat terminal gear, multiformat video router

HRS committee control rooms: CG, multidisplay processor, production switcher, PTZ camera control panel, terminal gear

The mission of the House Recording Studio (HRS) is to provide the United States House of Representatives with the means to conveniently convey information to its constituents, the media and the general public. It offers radio, television, teleconferencing and tape duplication, serving a campus-like environment with centralized Capitol Hill facilities located in the Rayburn House Office Building (HOB) and the Capitol Visitors Center (CVC).

With a spike in social networking and the demand for HD, the increased responsibilities of the HRS warranted the design and build out of a new studio and two committee control rooms. The HRS contracted with Ascent Media, whose engineers factored the existing environment and its ongoing maintenance needs to recommend equipment and update designs. Recommendations were made based on the familiarity and experience of the HRS staff with their current equipment and inside knowledge of equipment and workflows.

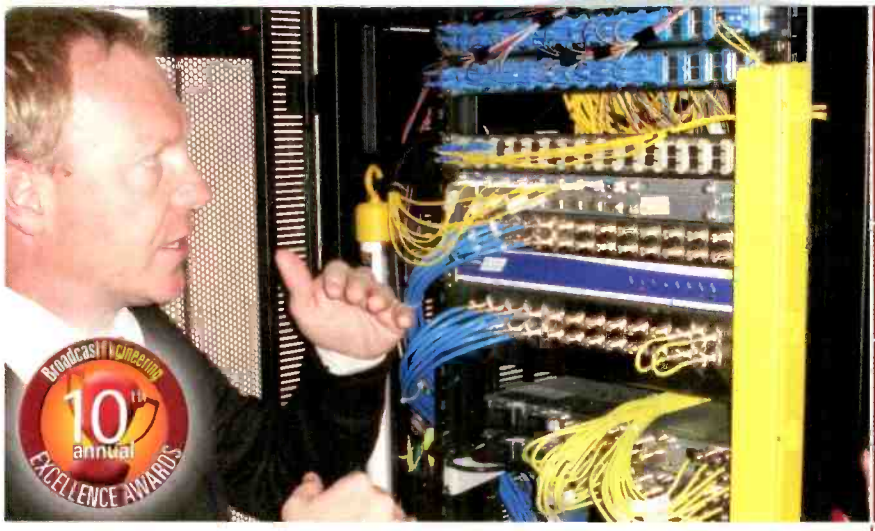
The challenges were plentiful and included:

- retrofitting new designs to remain compatible with the old;
- combating significant space limitations in the design process;
- accessing separate, secure areas more than a 1/2mi apart with individual checkpoints;
- transparently implementing the project without interruption to House operations; and
- meeting a 90-day deliverable.

Without notice, the House can stay in session around the clock, making it necessary to perform the bulk of the installation during summer recess. In addition, the new studio and control rooms were the first facilities of their type in the CVC. Communicating with the existing infrastructure in the Rayburn HOB wasn't seamless. Using fiber tie lines between the routers and fiber conversion gear, the Ascent team achieved the successful transmission of all audio, video and control signals between facilities. Linking the new control panels to the various committee room cameras was of particular difficulty. The HRS produces content from approximately 30 committee rooms around Capitol Hill, each of which may contain four to five cameras apiece. There are 14 control rooms that, via an overlay to the routing infrastructure, can be routed to control any of the 30 committee rooms.

With space at a premium, the project was limited to ~270 sq. ft. of studio space and ~56 sq. ft. per control room, presenting available surface area concerns. The new HRS HD studio in the CVC is a smaller version of two studios currently in operation in the Rayburn HOB. Using the existing cameras, video switcher and audio platforms, Ascent constructed a compact studio solution with increased functionality to better accommodate the current workflow and anticipated increase in projects. The control room size limits the operation to a one-to-two-person operation as console space is at a premium.

This project produced a compact, two-camera HD studio and related control room as well as two updated committee control rooms.



VenueNet+

Excellence Award category

New studio technology — HD

Submitted by

Level 3 Communications

Level 3's VenueNet+ is a service that provides high-quality HD and SD digital video transmission services to broadcast customers from major sports and event facilities, delivering live video to hundreds of destinations via the Vyvx network.

VenueNet+ facilities consist of multiple sites throughout the country. In addition to 31 NFL venues, there are multiple Level 3 Vyvx gateways, two operations facilities (Tulsa, OK, and Broomfield, CO) and an owned-and-operated teleport facility in Atlanta. Additionally, Level 3 customer facilities are enabled to receive or transmit from the VenueNet+ facilities.

Facilities range from new venues such as the New Meadowlands Stadium, in New Jersey, to long-standing icons such as the Lambough Field in Green Bay, WI. All locations have unique challenges that had to be overcome to enable the service, but the end result is a common set of customer interfaces on the customer-built and designed VenueNet+ white panel with a common set of services at all venues.

VenueNet+ goals are to provide an HD-SDI 3Gb/s-capable infrastructure; use fiber for the Vyvx connections at all venues; supply high-speed Internet services at the white panel, including scalability up to 10Gb/s; support future Level 3 data services such as VPN and private Ethernet services; enable proactive, always-on management connections; deliver signal detection at the panel; provide VoIP services via the Level 3 voice services portfolio; and use a converged access solution to provide voice, data and management connections.

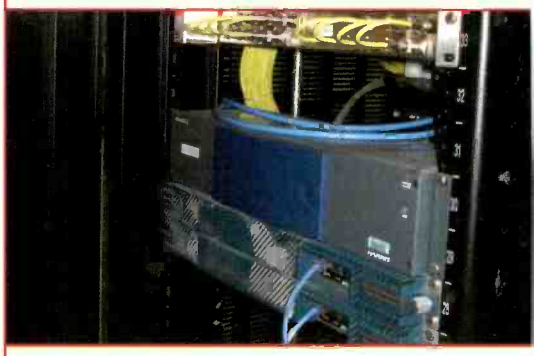
The VenueNet+ service incorporates a comprehensive suite of broadcast transmission tools that integrate into broadcasters' production workflow, making it possible to get all the services they need from one provider when producing and backhauling live games from a major league venue. Everything is already on-site, ready to go and fully managed 24/7 by trained Vyvx broadcast staff that become part of the overall production team.

The services provided are dynamic for each event. As such, each event requires a reconfiguration of the network hardware. The VenueNet+ implementation includes the addition of the VenueNet+ hardware to the Vyvx scheduling and control systems. The scheduling system allows the resource to be booked in advance of the event, which enables customers to know well ahead of time that the resources are available and reserved for their use. The control system automatically provisions the network just prior to the event.

VenueNet+ also combines enhanced local access with integrated uncompressed 1.5G and 3G HD encoding that eliminates the need for the broadcaster to ship equipment beforehand or use a third party to encode their video, improving setup and workflow on-site. Level 3's high-speed Internet service supports large file transfers, including video files and broadcast operation tools that make production workflow more effective. The service also provides Level 3 enterprise telephone service for broadcast communications with the production studio during the game to manage and coordinate with broadcast headquarters. ■

Technology at work

Aaxeon: ZEP-LNX1802GNT Ethernet switch
APC: ZEP-BE550G power
Cisco: CISCO2811 router
Evertz: 3405FR-BNC fiber-optic SFP frame, 7700FC+3RU VistaLINK frame controller, 7707VB13-2-OC12+3RU, 7707VB15-2-OC12+SC+3RU, 7800FR 3RU multiframe chassis, 7800PS AC power supply
Force10 Networks: S25-01-GE-24P-1, S50-01-10GE-2P
Harris: P32X32HSIE Panacea router
Overture Networks: 5122-951A, 3000-055, 3000-056, 3000-057
Scientific Atlanta: D133MJMJ000000060, D133MJMJ0000B0053 chassis
Walker and Associates: 4212924L1
Zephyrus: ZEP-HDVN-002 I/O panel



World Wrestling Entertainment

Excellence Award category

New studio technology — HD

Submitted by

Grass Valley

Design team

Grass Valley: Larry Mast, dir. broadcast sys. group; Ted Rogers, dir. of eng.; Ed Casaccia, dir. prod. mgmt.; Niall McDonnell, software design eng. mgr.; George Gonzalez, field service eng.

Request Communications: Systems integration

World Wrestling Entertainment: Mike Grossman, sr. VP TV oper.; Lionel Hightower, VP eng. and broadcast oper.; Chris Argento, VP post prod.; Kevin Quinn, VP TV tech.; Anthony Landi, dir. eng. and broadcast oper.; Tracey Shaw, dir. of oper.; Dave Benoit, tech. proj. mgr.; Ian Bowker, consultant; Craig Thomas, consultant

Technology at work

Grass Valley: Aurora HD editing and production platform; K2 media servers, K2 SAN, Trinix NXT HD video router

Nesbit: MAM system

Oracle: Sun StorageTek SL8500 robotic library system

SGL: FlashNet archive management software

Nearly two years ago, the main broadcast and production facility for World Wrestling Entertainment (WWE), in Stamford, CT, underwent an extensive renovation to upgrade all of its content creation and distribution systems to HD, file-based media, and it has never looked back.

Not satisfied with a single HD signal path, engineers designed the Stamford facility to ensure 24/7 system uptime via a highly redundant, dual HD-SDI path architecture that features completely separate primary and backup operations. The result has been increased productivity and the automation of manual tasks to get content quickly to viewers across multiple platforms.

The Stamford HD facility produces upward of 100 hours of programming each week for its combined domestic and international properties. All of this content is stored on a multilayered SAN, which allows eight channels of embedded audio, based on the latest version of Grass Valley K2 media servers and the Aurora HD editing platform (with Aurora Ingest and Aurora Browse).

Every piece of media content that WWE produces in-house or that comes in from an outside source is handled as I-frame MPEG-2 at 70Mb/s, which helps maintain image quality throughout the content creation process. This also makes it easy to store and retrieve clips from the 12 four-channel K2 media servers installed.

To maintain full redundancy and ensure that WWE's staff has all of the bandwidth it needs to complete its projects, the engineering staff has divided the editing environment into two main areas: "X" (primary) and "Y" (backup). Both are mirrors of each other to protect against downtime and currently consist of 14 Aurora viewers and 20 full Aurora Edit workstations tied to 135TB of storage (per area). This gives producers and editors full access to the centralized archives for search and retrieval of any clip through the Aurora Browse interface.

Today WWE's HD digital production system includes 16 HD ingest channels and a capacity of 3800 hours of HD, with 15,000 hours of online proxy storage. Additionally, the K2 media server is used in three linear edit suites, where Editware's Fastrack editing system is used as a hybrid editor. Video effects can be linearly recorded through the Kalypso video switchers in real time, or prebuilt video clips can be placed and/or manipulated on the timeline in nonlinear fashion. The final product can be played out, saved as a complex playlist or exported to an Aurora Edit system for additional editing.

The ability of Aurora to wrap media as MXF to export to WWE's Fairlight Digital Audio workstations and ability to import WAV and export OMF has facilitated the preservation of the end-to-end digital workflow.

For archiving, the Aurora interfaces with an in-house Nesbit MAM system and SGL 8500 robotic (LTO-4 tape) library system. A hierarchical layer of software from Dixon Sports is now being implemented to run alongside the Nesbit and Grass Valley systems without having to recreate the metadata needed to search the thousands of hours of media content stored in the system.

Bradley University Arena

Excellence Award category

New studio technology — nonbroadcast

Submitted by

XOS Digital

Founded in 1897, Bradley University is a private, independent university located in Peoria, IL, offering undergraduate, graduate and continuing education programs in liberal and fine arts, the sciences, business administration, communications, education, engineering, and health sciences. Bradley Athletics welcomed the digital era with the opening of the Bradley University Arena in August 2010. The 4200-seat facility houses the Bradley Department of Athletics and will serve as the home court for both the women's volleyball and basketball teams. In addition, the arena includes a practice facility for both men's and women's basketball teams, including a fully equipped athletic training center complete with a hydrotherapy room, 12 locker rooms for all student athletes and offices for the entire Department of Athletics. In total, the building features 16 basketball hoops, six basketball courts and six volleyball courts.

Bradley fans can enjoy the modern facility with nine digital graphic displays and two video boards that significantly enhance the in-game experience. Providing broadcast-quality HD content for the video boards was the primary goal of the XOS Digital design and integration project. The entire complex was cabled with SMPTE hybrid fiber optic, triax and 12-pair audio. Budgets are typically tight for university projects and offer little wiggle room, but the XOS turnkey solution fulfilled all of Bradley's production needs, and provided equipment to support an array of events.

The allocated space for the control room was limited. However, with a small footprint and multistandard abilities, the Panasonic AC-HS400AV switcher was a perfect fit. The built-in multiviewer eliminated the need for multiple monitors. Two onboard frame stores and 3-D transitions gave the programming a true broadcast look, while the ease of setup and operation provides the student-run production with a professional touch. Graphics from Compix and an iMac for clip playback completed the ensemble within the budgetary guidelines. Sony PMW-EX3 cameras equipped with 12X and 17X Fujinon lenses were chosen for their excellent 1080i capabilities and small size. Telecast Fiber Systems CopperHead fiber-optic interfaces transport the signal to the control room.

Flexibility played a critical role in the design consideration. In addition to the video boards' main feed, the control room required Internet streaming, ingest and editing capabilities. Futureproofing the facility for other media, such as smart phone streaming and IPTV, played a major role in the undertaking.

The Basketball Performance Center was equipped with Sony steerable HD cameras and a designated control and recording room. The programming from the main control room is viewable in the practice center video room and all of the team spaces.

Since opening its doors in 2010, the Bradley Arena continues to impact the athletes with cutting-edge training and thrill students and alumni alike with state-of-the-art sports and entertainment experiences. ■

Design team

Bradley University: Bobby Parker, asst. athletic dir.
Daktronics: Brian Reimer, proj. mgr.; Richard Krautter, proj. eng.
XOS Digital: Jim Pile, broadcast eng.; Tim Goodman, sys. eng.; Derick Jordaan, proj. mgr.

Technology at work

AJA Video Systems: Digital video acquisition
Apple: Clip storage and playout
Clear-Com: Intercom
Cobalt Digital: Open gear processing and conversion
Compix: LCGn graphics system
Daktronics: Video display and graphics boards
Fujinon: 17X and 12X lenses
Kramer: Video and audio routing
Mackie: Audio system
Marshall: Monitoring
NewTek: 3Play instant replay
Panasonic: AC-HS400AV switcher
Sharp: Monitoring
Sony: PMW-EX3 cameras
Telecast Fiber Systems: CopperHead fiber transmission system, Rattler fiber transmission system

Dallas City Hall Building

Excellence Award category

New studio technology – nonbroadcast

Submitted by

Burst

Design team

Burst: Don Rooney, VP of eng.; Tom Norman, sr. eng.; Dave Stengel, sr. proj. mgr.; Marc Brooks, site supervisor; Sean Clark, wireman; Tom Smith, sales exec.; Debbie Goldin, office mgr.
City of Dallas: Bennie Wilcox, IT mgr.; Tommy Reyna, sr. producer; David Zepeda, production technician

Technology at work

ADC: PPE2232-MVJT-BK video patch bay
AJA: FS1 frame synchronizers
Audio Accessories: WEP-962-SH audio patch bay
Bittree: B422-F16S/6 RS-422 patch bay
Clear-Com: KB-702 intercom station, MA-4 IFB control panel, PIC-4704 IFB central electronics, RM-702 intercom station, RS-601 intercom beltpack station
Harris: 6800+ series terminal equipment, SG-410 sync test generator, ZP2-HD16 multiviewer
Hitachi: HV-HD30 HD cameras
Mackie: 1604VLZ audio mixer
Orad: Morpho CG/graphics package, SmartSet 3-D virtual set system
Ross Video: Synergy 100MD production switcher
TV One: C2-2355A video scalers

Smoke and mirrors aren't responsible for the crystal-clear sets viewers are admiring on footage streaming from the City of Dallas' new broadcast studio. Rather, it's the efficient three-camera 3-D virtual TV production studio tucked snugly into the basement of the City Hall building in Dallas. This project was funded in its entirety by a cable TV fund to maintain and upgrade the infrastructure of the cable system. No public or taxpayer dollars were used.

Burst, a Denver-based systems integrator, built the virtual studio, which affords the city with HD production and post-production capability in addition to a studio environment where the computer-generated sets can appear to be anywhere — a sunny beach or the state capital — and where the perspective of the background can shift depending on camera angles. The city needed the studio to record the mayor's statements in a controlled environment, and all programming that involves the mayor's office is produced there. The goals of the facility were to provide maximum versatility in the minimal space available and to design a studio that could be run by a single operator. The city can broadcast on its own in-house channel and record city council meetings. The facility also serves as a central area for post production and editing.

This turnkey facility was built from the ground up to meet the specific needs of the City of Dallas. Space was the biggest issue; there wasn't enough room to accommodate a large set area, so Burst built a virtual 3-D set to create a larger look. The City of Dallas also required a studio that could be operated efficiently by a small staff. With robotically controlled cameras mounted on pan-and-tilt heads, a single operator can produce a complete program.

The facility is shoehorned into a small space, about 1100sq-ft in all, that includes a 630sq-ft studio, a makeup room, an edit room with two editing stations, a control room and a green room. It has low ceilings adjacent to a server room that periodically generates audible alarms. In addition to the noise from the alarms, the HVAC system posed a challenge. It had to deliver enough cool air to keep the equipment and the studio at the right temperature without making too much air flow noise. To compensate for the noise issues, a whisper room was built into the studio to provide a space isolated from noise.

Featured prominently in the system are a virtual set system by Orad, video switching by Ross Video, multi-image viewing and terminal equipment from Harris, post production from Avid, and intercom equipment from Clear-Com. Also part of the system are frame synchronizers from AJA and video scalers from TV One, with video, audio, and control patching from ADC and Audio Accessories. The Orad virtual studio package enables city officials to appear to the audience as though they are wherever the background says they are. Rather than having to schedule remote shoots to capture the necessary ambience, shooting is done in the studio, which creates significant time savings and efficiencies. Through the scalers and frame synchronizers, post-production facilities and the ability to create virtual sets, it is possible to create environments and deliver effective messages in ways previously not possible.

FedExField

Excellence Award category

New studio technology – nonbroadcast

Submitted by

Communications Engineering, Inc.

When the Washington Redskins kicked off the 2010 regular season against the Dallas Cowboys, its fans were treated to a completely new stadium experience thanks to a comprehensive HD upgrade to the FedExField video control room and infrastructure by Communications Engineering, Inc. (CEI).

The new system enables the event-day control room to originate HD programming and to transmit the signals to the new FedExField HD LED video displays and stadium-wide video distribution systems, and places the facility at the leading edge of NFL stadium technology.

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

The fans experience a dramatic improvement in the video, graphics and sound, and CEI's staff has seen significant advancements in the system capabilities and operation on game day.

The systems integrator was responsible for developing engineering and operational information, while producing conceptual and detailed designs for the FedExField control room requirements. The project included generating floor plans, signal drawings, schedules and power requirements, as well as designing operating consoles, furniture and interfaces to existing stadium systems. It is designed to integrate with the HD broadcast trucks at FedExField.

CEI also performed complete integration, testing and training at FedExField, while providing equipment and project management services for the entire modernization process, including schedule and budget controls. The system features new routing and production switching systems, monitoring equipment, fiber transmission equipment, intercom system and HD cameras.

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

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

Design team

CEI: Frank Giliotti, VP of technical services; Felix Pena, dir. of mechanical eng.; Matt Weiss, sr. managing eng.
Washington Redskins: David P. Donovan, COO; Lon Rosenberg, SVP ops.

Technology at work

Apple: Final Cut Studio edit system upgrades
Boland: HD/SD displays
Click Effects: Dual Channel Crossfire multichannel HD clip server system
Evertz: VistaLINK controllers, signal converters and multiviewer system
EVS: HD slow-motion video system
Fujinon: HD camera lenses
GMS: Wireless camera system
Grass Valley: K2 Solo SD/HD server
Harris: Video routing equipment
Image Video: Tally system
LG: M3800S-BN HD displays
Planar: Clarity Matrix LCD displays
Ross Video: HD switcher
Sony: HSC300K HD cameras
TBC: Consoles
Tektronix: WFM7120 waveform monitors
Telex: Zeus intercom
Wohler: AMP2A-10S audio monitors

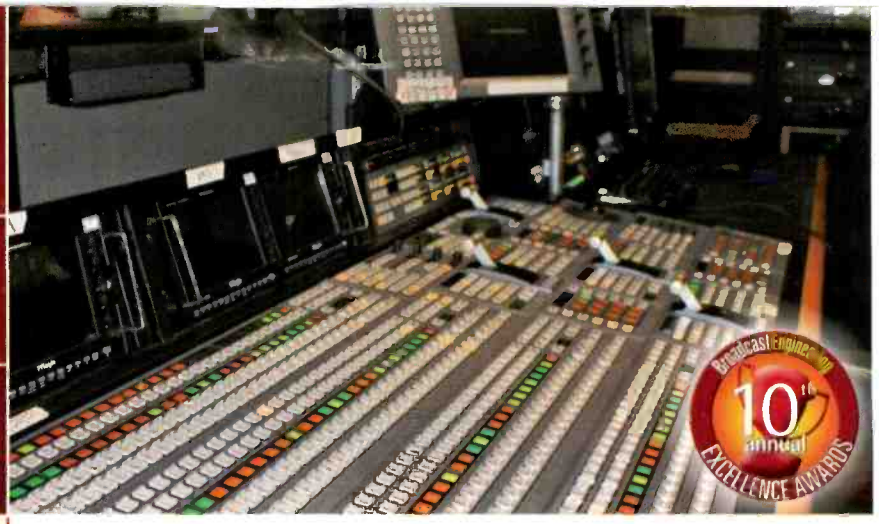
Georgia Dome

Excellence Award category

New studio technology — nonbroadcast

Submitted by

Comprehensive Technical Group



Design team

Comprehensive Technical Group: Jim Wile, pres.; Steve McCormick, VP; Kevin Gabriel, technical ops. mgr.; Josh Shibler, proj. mgr.; Doug Wake, sr. eng.; Ry Alford, acct. mgr.
Darden and Company: Bill Darden, Jason Hughes
Georgia Dome: Carl Adkins, GM; Beverly Wilson, ops. mgr.; Eddie Daniels, eng.
Wrightson, Johnson, Haddon & Williams: Chris Williams

Technology at work

Apple: Editing, storage
Avid: Deko graphics
Avocent: KVM
Evertz: MVP, terminal equipment
EVS: Slow-motion system
Fujinon: Lenses
Grass Valley: Routing switcher
Harris: Testing equipment
Riedel: Intercom
Sony: Cameras, displays, production switcher
TBC: Consoles

The Georgia Dome ("the Dome") in Atlanta opened in 1992 as a new entertainment venue, and, in 2003, the Dome crew chose Comprehensive Technical Group (CTG) as the systems integrator to upgrade its video control room from analog to SD digital.

More recently, as part of a $55-million building renovation, the Georgia World Congress Center Authority, owner and operator of the Dome, wanted to update the capabilities of the Dome's video control room, which provides all of the content for the venue's two large video replay screens. The Dome again chose CTG to upgrade this control room to make it a complete HD video facility. It allotted $2.7 million for this part of the renovation.

While the Atlanta Falcons are the primary client for the Dome, the video system must also support the needs of Supercross, Battle of the Bands, business conferences and numerous other events. Because the video services group from the Dome supports such a variety of events, CTG designed the system to be highly flexible to meet changing needs.

In addition to the HD upgrade, the Dome wanted a digital workflow for game-day elements. To do this, CTG provided a shared-storage environment that ties together an EVS slow-motion system, Apple Final Cut Studio editing and Ross Video Systems SoftMetal video servers.

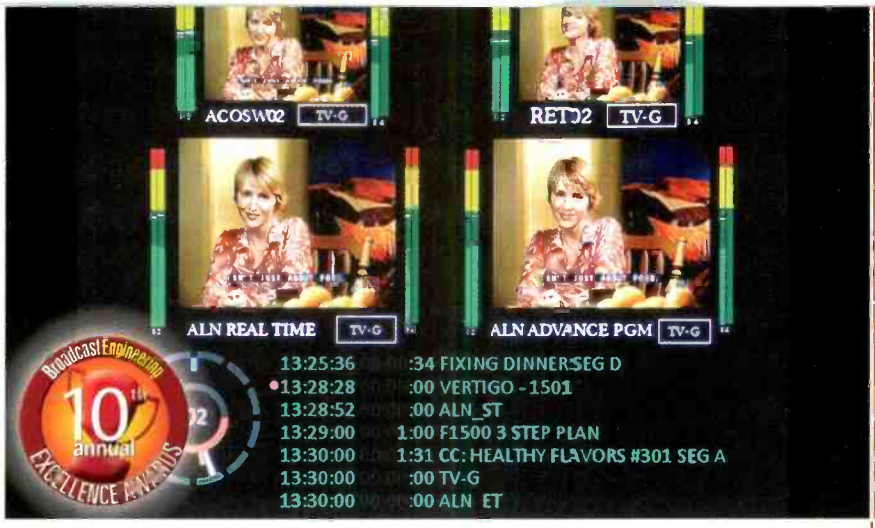
Because of a limited budget, CTG's focus was on infrastructure. The Dome was only able to purchase two of the needed cameras, so it rents three additional cameras for certain events. In an effort to maximize the number of available camera views, 10 tie lines tie into the network production truck.

One of the biggest challenges was the physical space limitation for the video replay system. With only about 450sq ft, it was an ergonomic challenge to fit 11 equipment racks and 11 personnel. The physical layout required a great deal of planning and coordination. Of the seven core equipment racks, there are collectively 14 unused rack spaces.

The Dome staff and CTG worked to minimize the cost of this newest upgrade by installing intrarack cabling, connectors and patching to be HD-ready. Additional savings came from using the existing Grass Valley Concerto routing switcher frame; CTG simply added new crosspoint cards to upgrade the router to HD.

The Dome's video production staff has seen many benefits from this upgrade: The new shared-storage environment greatly reduces the amount of videotape the production staff handles. The new system allows the Dome to change advertisements on the "wings" of its video replay screens where there were previously fixed advertisements. And, the KVM system connects all systems to convenient user stations to make troubleshooting and configuration easier.

CTG also worked on the audio system renovation that followed and completed the project ahead of schedule and under budget.



Comcast Media Center

Excellence Award category

Station automation

Submitted by

Comcast Media Center

With the launch of its latest control room, Comcast Media Center (CMC) developed a new solution for multichannel program origination that improves program uptime while simultaneously reducing operator workload. This customized approach to advance playback, when applied to the appropriate programming model, strikes the perfect balance between operational overhead and on-air performance, making it one of the best performance-per-dollar models in the program origination industry. With the solution, CMC uniquely implemented features readily available in the Avid Sundance Titan automation and Evertz MVP systems and combined them with its custom "Heads-Up" application to make the most efficient use of staff while simultaneously ensuring near-perfect uptime.

With the advance playback model, CMC staff runs the scheduled programming hours in advance of the true air time, caching the programming into delay servers, which replay the content at its scheduled time. This approach allows the operators to monitor a preview of the program signal and, should there be a deviation from scheduled programming or a system failure resulting in program interruption, the operator can mark the time of the discrepancy, recover the service and cover the discrepancy from a parallel real-time program path at the true air time. Through a synchronizing feature, the Titan system allows the operator to edit the advance playlist and have changes automatically update the real-time playlist, saving edit time. Conversely, edits can be made on the real-time playlist, maintaining the cached version of the advance schedule in its original form as a fallback.

The advance playback control room also employs a live event management pod, which contains a dedicated live event operator that can manage dynamic live events autonomous of the main master control operator. In such a case, the live event operator routes the live program to air while the master control operator continues running alternate programming offline, ensuring failure of the main venue feed or a catastrophic failure of the live event pod results in minimal interruption to the on-air programming.

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

The HUD system presents only the most critical elements of the automation playlist, essentially decluttering the schedule information compared with the traditional automation display. The HUD includes a clock display that marks color-coded next-up primary and secondary events and countdown information on the clock face. At the five-second mark, it displays a flashing color-coded solid arc and a color-matched icon next to the event in the scrolling rundown to ensure the operator knows which event is executing next. When the event executes, a countdown begins for the next event.

Design team

Avid: Sean Pendleton, software development
CMC: Griffin Moore, software eng.; Jeff Hagny, applications eng.; Rich Rivera; mgr., sys. integration
Omneon: Ben Frost, sys. eng.

Technology at work

Avid: Sundance Titan automation
CMC: SSG custom software
Evertz: MVP multiviewer
Omneon: Spectrum servers

Encompass Digital Media

Excellence Award category

Station automation

Submitted by

Encompass Digital Media

Design team

Encompass: Donald Rodd, VP eng. and tech. ops.; Jim Schuster, exec. VP, president Atlanta; Steven Southern, lead broadcast eng.
NBC Universal: Jason Kornweiss, VP broadcast ops.; Matthew Braatz, sr. VP broadcast ops.
TI Broadcast Solutions Group: Michael Wright, pres.; Jared Timmins, dir. strat. acct.; Patrick Daly, dir. design eng.; Brian Kincheloe, dir. field ops.

Technology at work

Harris: NEXIO servers
Isilon: NL36 storage nodes
Level 3: Multigig fiber infrastructure, OC-12 to each spoke site
Miranda: Alto multiviewer, EAP-3901, HCO-1821, IRD-3802, IRD-3811, KX multiviewer, XVP-1801
Signiant: Content Distribution Management software
Snell: Pro-Bel Morpheus automation and content management, Pyxis and Cygnus routers
TANDBERG: RX1290, E5780 encoder
Telestream: FlipFactory file-based transcoding engine

Encompass Digital Media partnered with NBC Universal in the summer of 2009 to create an innovative broadcast solution for 10 owned-and-operated NBC stations, seven Telemundo channels and 20 digital subchannels. As the station group's hub, Encompass handles the national distribution of NBCU's syndicated content and network programs, promos and commercials. Operations also include 24/7/365 master control, engineering, traffic support, ingest, syndicated recording, quality control, playout and ad insertion.

Encompass' Atlanta facility provided the infrastructure necessary for NBCU to make HD upgrades, streamline operations and unify workflow among its local market stations across the United States. Systems integrator TI Broadcast Solutions Group (TI-BSG) worked closely with Encompass and NBCU on the design, installation and integration of equipment.

With an aggressive timeline, Encompass went from the reconstruction of its existing facility to having the first flagship station on the air in just 88 days. NBCU's hub spans 3200sq ft and features eight master control pods and a state-of-the-art machine room with 31 racks, plus dedicated space for traffic and ingest. Based on a store-and-forward design, TI-BSG integrated an extensive array of equipment collocated at each local broadcast station.

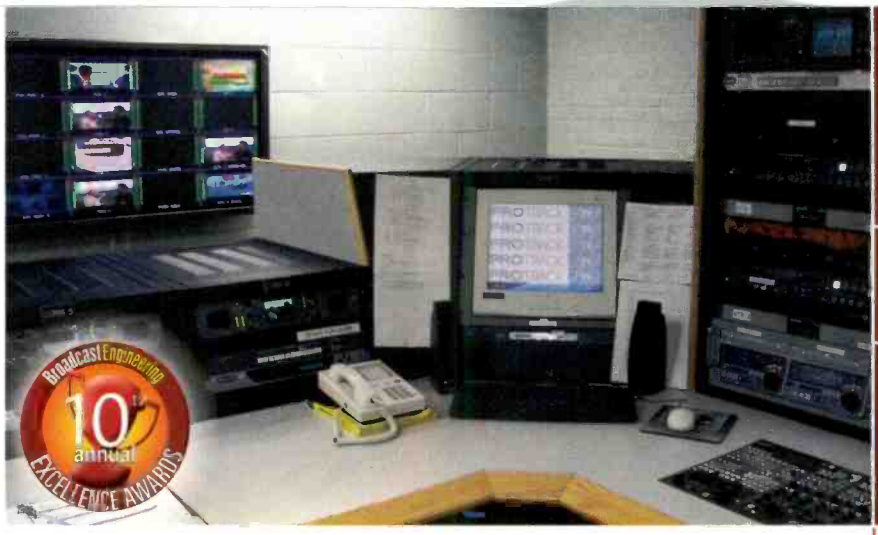
As part of the solution, Encompass paired Harris NEXIO servers with Snell's Morpheus automation system. This customized approach ensures seamless delivery of NBCU's digital content over a nationwide fiber infrastructure.

Encompass also leveraged the functionality of Miranda Technologies' wide array of Densité modular products for a majority of the ancillary gear. Using the Web-based iControl platform, Encompass engineers and operators can monitor and control the equipment in every remote location, allowing for real-time response when modifications need to be made.

Miranda Alto and KX multiviewers also enhance Encompass' capability to monitor multiple points within all of NBCU's stations. By bringing back full-resolution returns from the remote equipment, NBCU at Encompass can see and hear all content activity within each station's equipment racks. As a result of its Snell solution, Encompass' master control can roll multiple station breaks across several cities simultaneously.

In addition, redundant playout servers and A/V processing gear in Atlanta support each station undergoing maintenance with no interruption to the viewer. The playlist can run through servers in Atlanta and deliver content directly to the station's transmitter chain via fiber or satellite, bypassing the entire store-and-forward infrastructure.

Encompass' nonlinear, IP-based hub-and-spoke model has worked well for NBCU. The success of this central-casting solution has contributed to the successful broadcast of many high-profile events, including NBCU's coverage of the Vancouver 2010 Winter Olympics. This signified the first major milestone for NBCU's hub at Encompass and serves as a testament to the reliability and effectiveness of the innovative new design. ■



WVPT-TV

Excellence Award category

Station automation

Submitted by

Myers Information Systems

WVPT-TV is a 42-year-old public TV station focused on using the power of broadcasting to bring education and culture to its viewers, an audience spread over four states, 40 counties and two distinct market areas. With seven transmitters straddling Harrisonburg, VA, and Hagerstown, MD, WVPT competes not only with itself, but with sophisticated and better-funded stations serving the densely populated areas surrounding the capital. Hence, the PBS outlet is challenged to operate as efficiently as possible, using the best available workflow paradigms to sustain high content quality and ensure its accessibility to the widest possible audience.

WVPT embarked on its journey of workflow transformation some eight years ago, seeking to integrate content scheduling and asset management within a fully digital environment. Station management recognized that "intense communication" with manufacturers, as well as its own staff, throughout the process would yield the best results. WVPT approached vendors with requests to maximize the automation of mundane functions to free personnel for tasks best performed by people. Myers Information Systems, the station's long-time traffic supplier, listened carefully and responded. The company's ProTrack broadcast management suite became the project's central unifying element. Coupled with Titan automation from Sundance Digital (now Avid), WVPT's infrastructure evolved as new technologies and industry standards, such as BXF, made management's goals increasingly attainable.

Based on its successful relationship with Myers dating back to 1997, WVPT recently topped off the project with the installation of ProTrack's new MAM module, which provides comprehensive, business rule-based life cycle control over the station's digital files. ProTrack ensures that multichannel/multiplatform content is properly identified, catalogued, moved to and from the appropriate playback platform, and sent to archive until needed again. Asset locations, audio and video format, aspect ratio and other relevant metadata are readily accessible through the user interface and to the various automated processes that handle migration between storage devices, playlist (automation) tasks and other content management functions.

Today, WVPT enjoys a tight and efficient workflow between traffic and master control managing six on-air playlists, seamlessly exchanging metadata between its traffic and master control operations. With ProTrack in the lead, the station's content is reliably managed, scheduled, distributed and repurposed. And thanks to built-in exception monitoring, alert messaging and robust remote access, master control was scaled back to an unattended 24/7 operation without laying off staff; all six operators were successfully assimilated into other departments.

ProTrack's MAM and other modules allow the station to meet and exceed "connected viewer" expectations with timely content repurposing delivered across the spectrum of delivery platforms and devices. WVPT's ProTrack-centered workflow has freed station staff to more directly interact with the communities they serve while making content more accessible than ever before.

Design team

WVPT-TV: Tony Mancari, COO; Arlene Williams, QC eng.; Scott Kessler, maintenance eng.; John Harper, eng. mgr.; Jon Wenger, field services eng.
Myers Information Systems: Crist A. Myers, president/CEO; Nancy Carter, dir. of market. and customer relations; Eugene Diana, dir. of soft. dev.; Tracy Carter, CTO
Sundance Digital (Avid): Robert C. Johnson, (former) pres.; Eric Harrington, (former) dir. of eng.; Rick Stora, prod. mgr.
CUC Solutions: Scot Lamb, pres.; Paul Thurman, VP sales; Derek Black, VP tech.
SeaChange International: Phil Tillotson, dir. strat. acct.; Dick Scott, mgr. special proj.; John Keenan, broadcast service mgr.; Chris Stitsel, sr. support eng.

Technology at work

Avid (Sundance Digital): Titan automation
CUC: Archive system
Myers Information Systems: ProTrack TV broadcast management system, MAM module
SeaChange International: SD and HD file stores

M6

Excellence Award category

Network automation

Submitted by

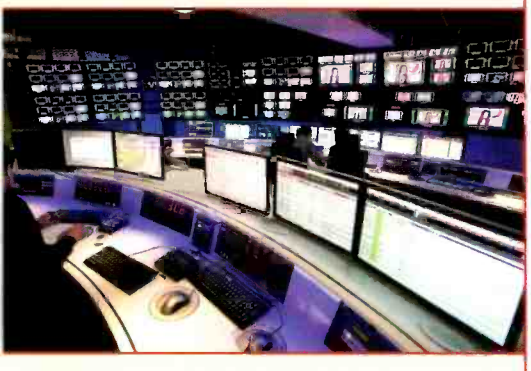
Omneon

Design team

M6: Christophe Foglio, CTO; Mathias Bejanin, dir. of eng.; Fabrice Tauzies, proj. mgr.; Bruno Bouillat, proj. mgr.; Mathieu Brossard, proj. mgr.

Technology at work

Avid: Edit system
Media & Broadcast Technologies: Phoenix media management system
Omneon: MediaGrid active storage system, ProXchange transcode system, Spectrum media server systems



Established in 1987 around the M6 Channel, France's Métropole Télévision Group (M6 Group) has become a powerful multimedia group that offers a wide selection of programs, products and services via broadcast, the Internet and mobile services.

In 2007, to address growing consumer demand for multiplatform content, the M6 Group technical team began planning a complete upgrade of the company's Paris production and delivery facilities. The upgrade was designed to create an entirely digital infrastructure facilitating efficient, cost-effective repurposing of media in multiple video formats not only for broadcast, but also for newer services including catch-up TV, video on demand (VoD), IPTV and mobile.

In building this file-based infrastructure, the M6 Group faced several challenges: to consolidate and centralize storage to reduce duplication of material and maximize the availability and value of assets; to enable fast, efficient repurposing of assets and achieve rapid turnaround for new media distribution; and to establish a highly stable and resilient system with complete redundancy. After evaluating solutions according to these requirements, the group chose to base its facility upgrade on a tightly integrated solution comprising Omneon video file infrastructure and processing systems and the Phoenix media management system from Media & Broadcast Technologies (MBT).

The state-of-the-art installation, completed over an aggressive 10-month schedule, incorporates seven Omneon Spectrum media servers, an Omneon MediaGrid active storage system and six Omneon ProXchange transcoding systems in an end-to-end file-based workflow for on-air delivery. Operating under the control of MBT's Phoenix, the video infrastructure supports M6 and W9 digital terrestrial channels, Paris Première and TEVA pay-per-view channels, three music channels, and preparation and distribution of content for VoD, IPTV and mobile.

The systems enable a high degree of automation and faster, more cost-effective processes from media ingest to content repurposing and playout for multiple platforms. The Spectrum systems support ingest and enable encapsulation of descriptive metadata — such as Dolby and loudness information — into the MXF-wrapped files delivered to the MediaGrid system, which provides centralized storage of all of the group's digital assets. The versatile handling of metadata and support for the latest MXF format enhances interoperability between other components in the system.

Running on the MediaGrid storage system, ProXchange generates low-resolution copies of media for fast, easy internal review and performs up to six simultaneous transcode operations to provide finished content in the correct video format for each distribution channel. Approximately 4000 clips are processed by ProXchange each week. All of this processing takes place within the MediaGrid, adding further speed to the M6 Group's multiplatform repurposing and delivery workflow. Since the completion of the system, the M6 Group has proceeded to expand its services and to fulfill new distribution agreements with Internet providers.

Starz Entertainment

Excellence Award category

Network automation

Submitted by

OmniBus Systems

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

As a longtime user of OmniBus Systems' Colossus, Starz had been an early adopter of the automation manufacturer's software-based iTX system. In 2009, the broadcaster decided to migrate its entire operation to the iTX platform. Several factors contributed to this decision: the need to create extra space for expansion; the expense and complication of operating and maintaining the existing equipment for 44 linear channels, each with its own backup; and the huge extra investment that would have been required to create a new equipment room. With iTX, Starz has been able to reduce its infrastructure from 44 racks to just 16, freeing up a considerable amount of space for growth without needing to extend the existing equipment room. The iTX platform, running on commodity IT servers and storage, also meets a key requirement of the design brief for the new infrastructure: By combining all the functions required for the sophisticated branded channels Starz broadcasts, iTX reduces the complexity of maintenance and potential for equipment failure, eliminating most of the recurring capital and maintenance costs.

To meet Starz's requirements for originating fully-crafted channels, the design team pressed OmniBus to accelerate development of some features already on the iTX roadmap. These features included extended graphic and effects capabilities to support Starz's style of branding, in-built Dolby digital surround-sound processing and Nielsen ratings code generation. OmniBus developers also extended iTX's closed-caption functionality to support both 608 and 708 formats. With iTX including the capability to meet all these requirements in software, Starz was able to further reduce its requirement for external equipment.

Using the iTX developer kit and working with OmniBus, Starz's own technical staff integrated iTX with the in-house developed asset management, content preparation and distribution systems to achieve a tight fit for efficient workflow. Hitachi storage and HP servers were chosen as the hardware. And although Starz configured iTX primarily as a platform for its linear channels, the all-software architecture fits well with the broadcaster's own media workflows for nonlinear services, helping to deliver further efficiencies in asset distribution.

The equipment cost of running 44 HD and SD channels with full redundancy has been significantly reduced at Starz by deploying this next-generation technology. Energy costs are also substantially lower, and by providing a single IT-based storage repository that can be leveraged across multiple channels and products, iTX enables Starz to dynamically map video, multiple audio tracks, captioning, and ratings data, providing greater flexibility and reducing storage requirements.

Design team

OmniBus Systems: Stan Kingett, project exec.; Andy Cooper, chief eng.; Eric Hicks, project mgr.; Zach Flower, eng.; Lorie Callahan, reg. sales mgr.
Starz: Amy Epstein, sr. proj. mgr.; Lonnie Scheele, exec. dir., broadcast eng.; Jim Porter, VP media sys. & IT dev.; Stephen Smith, dir., media sys. integration; Judy Batenburg, exec. dir., IT infrastructure & ops.; Colin McGuire, sr. mgr. IT svc. & delivery; Kirk Trost, sr. software dev.; John Ferguson – sr. mgr., broadcast op. center; Cody Waggoner, media sys. adm.; Tim Rasmussen, mgr., broadcast eng.; Doug Reither, mgr., broadcast eng.; Michael Price, sr. designer; Mark Sweeney, sr. broadcast eng.; Greg Luedke, sr. broadcast eng.

Technology at work

BlueArc: Storage
Hewlett-Packard: DL360 G6 servers, DL380 G6 NAS servers
Hitachi: Storage
OmniBus Systems: iTX automation
Wohler: 16x1 Touch-It monitors

SWRV

Excellence Award category

Network automation

Submitted by

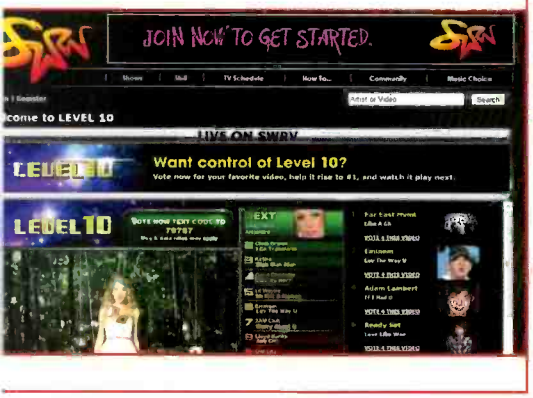
never.no

Design team

DSI: Don Niehoff, sr. proj. mgr.; Tom Sullivan, sr. eng.
Harris Creative Services: Brian App, David McEwen, David Goodfellow
Music Choice: Angelica Casey, Joe Cotellese, Rob Decker, Stuart Farber, Ivan Fokin, Dow Lam, Bryan LeBlanc, Qingrui Liu, Steve Malaby, Siva Mateti, Randall Rivera, Nayan Sheth, Fei Wan
never.no: Rune Bjerke, Andreas Dahl, Johan Fredrik Juell, Åse Lill Stenvik Jakobsen, Torgeir Hansen

Technology at work

360 Systems
Avocent: KVM
Crystal Vision
Evertz
Harris: Connectus, IconMaster, Inscriber G-Series, NEXIO, Videotek T&M
never.no: Interactivity Suite
Teranex
Wohler



Music Choice, the largest music content provider in the United States, sought to grow its business and become the music channel for the millennial generation of music fans. The result is SWRV, the first completely automated interactive network. It produces music video content 24 hours a day based on viewer interaction. To achieve this, Music Choice implemented a team approach with partners and their respective technology, including Harris NEXIO video servers and IconMaster, and never.no's Interactivity Suite and Dynamic Content Scheduler (DCS).

SWRV gives viewers direct control over music videos being played by the network. For example, the voting results of certain shows select the next video played within seconds before airtime. Viewers submit photos and comments that can appear on-air in seconds. This constantly changing schedule of video and on-air graphics amounts to thousands of content decisions. SWRV is a multiscreen experience for viewers. The SWRV broadcast and website operates in sync with one another. The live scheduling system drives both to maintain a harmonious experience for viewers.

One of the most challenging aspects of SWRV comes from the fact that music videos can be as short as three minutes and as long as seven. Coupled with last-minute selections from the audience, hundreds of production decisions are made for a single show and thousands throughout the day. Music Choice built a sophisticated live scheduling system that directs never.no's on-air video and graphics control software, which in turn performs real-time control of the Harris broadcast systems. It continuously adjusts the schedule to the audience's desire in real-time. It selects every broadcast and broadband content element, as well as adds and drops show segments and commercial breaks while maintaining the show's scheduled airtime.

SWRV operates without the traditional on-air broadcast control center and staff. It's the interactive component that makes SWRV's automation technology a nontraditional linear network and thus unique. At the direction of SWRV's live scheduling system, never.no's DCS controls video, graphics and text screen elements that appear on-screen. It does this by effecting control of the NEXIO AMP video servers and their G-series RTX graphics systems. Never.no engineers used the SWRV's native software as the platform foundation and then deployed customized modules as building blocks to deliver intelligent show/concept switching. One result was the development of DCS 2.0, which incorporates a powerful custom jukebox module to control the Harris IconMaster, enabling squeezeback and volume control for the video server signal.

For viewers, it's that dynamic, user-determined data that makes SWRV engaging. Changes are constantly happening based on voting and/or user-generated videos. SWRV has 10 programs for which viewers submit their own content, vote for and rate videos, or take over a programming block. The launch of SWRV represents the advent of a promising era for Music Choice and fully automated interactive networks. With SWRV, Music Choice has taken dynamic scheduling and playout based on user interaction to a new level.

CNN

Excellence Award category

Newsroom technology

Submitted by

Omneon

At its Atlanta headquarters, CNN undertook the replacement of its aging SD feed-ingest, edit and playout infrastructure with new HD equipment. In doing so, it intended to move from a proprietary video system to a more generic data-driven approach that would reduce costs, maximize interoperability, and increase both system flexibility and business unit agility. The demands of the 24-hour news cycle meant there could be no performance compromises during construction and that, when complete, CNN's news production workflows would afford much greater efficiency and speed. This was accomplished through collaboration between CNN's Broadcast Engineering & System Technology (BEST) and the Omneon (now part of Harmonic) Broadcast Solutions Group, which together defined and shepherded the project through to completion along with other key vendors, including Apple, Avid, Cisco, IPV, Sony and Vizrt. The Omneon Media Application Server (MAS) was the lynchpin of the project, and the platform's open architecture enabled CNN to select best-of-breed components and integrate them into a cohesive system. Today the SOA-based platform from Omneon provides CNN with several key functions. First, it presents a single virtualized view of content across all managed systems. Second, it enables CNN's own user-facing media management system (MediaSource-2) to access media metadata easily and trigger system functions such as file movement and transcoding.

While the system's design does not enforce one specific workflow, the typical workflow starts with Viz Dart, which operators use to schedule a feed ingest or trigger a crash recording. Even before the recording begins in an Omneon MediaDeck, metadata is exchanged to make an association between the file in the MAS and CNN's MediaSource-2. As the HD XDCAM-35 file begins recording on the MediaDeck, the MAS manages file transfers to IPV (to make proxies) and two 126TB Omneon MediaGrid active storage systems. Within 10 seconds of the beginning of ingest, the growing file becomes available on each MediaGrid and can be opened in Final Cut Pro using Sony's Cinemon plug-in. Files are edited on the server; they need not be copied to local storage. More typically, writers and producers use MediaSource-2 to create projects, view proxies and select video clips. Later, an editor selects the project in MediaSource-2, and the project automatically opens Final Cut Pro with all the candidate clips already "in the bin." When an edit session is complete, the file is exported to one MediaGrid while MAS simultaneously copies the file to the other (backup), to IPV (new proxy generation) and to two Omneon Spectrum media server systems (playout). Playout is managed by Avid ControlAir. Other workflows transcode and rewrap files, send material to and from archive, and exchange material with CNN's New York and Washington bureaus, both of which are planning similar architectures. Through MAS and MediaSource-2, users will be able to view contents from all locations from a single interface. In the meantime, CNN's management can leverage a production foundation that offers the flexibility and agility needed to excel in a rapidly changing environment. ■

Design team

CNN: Michael Koetter, Dan Shockley, David Adams, Howard Ginsberg
Omneon: Matt Adams, Paul Lissauer, Chris Lee, Brian Chavez, Freddy Dubon, Simon Eldridge

Technology at work

Apple: Final Cut Pro
Avid: ControlAir
Cisco: 6509 and 3750-E
IPV: XCode
Omneon: Media Application Server, MediaDeck video server, MediaGrid active storage systems, Spectrum media servers
Sony: Cinemon
Vizrt: Viz Dart

KSTP-TV

Excellence Award category

Newsroom technology

Submitted by

Alpha Video and Audio

Design team

Alpha Video and Audio
Hubbard Broadcasting
KSTP-TV

Technology at work

AJA: Kona LHe capture card
Apple: Final Cut Studio, iMac, MacPro Computer, XSAN 2, Xserve
Gallery: AutomationX rundown MOS interface, MediaService, Sienna IngestControl, Sienna OriginOne, Sienna PictureReady Channels, Sienna StoryCut, Sienna VirtualVTR Channels
Harris: IconMaster MC switcher, Platinum routers
Miranda: AFD inserters, terminal and conversion gear
Panasonic: AG-HPX300 P2 camcorder
Promise: 16TB VTrak storage chassis
Qlogic: Sanbox 9200
Samsung: SyncMaster 30T
SpectraLogic: T380
Volicon: Observer System
XenData: VideoHSM software

In 2009, KSTP-TV in Minneapolis/St. Paul, MN, and Alpha Video and Audio in Edina MN, collaborated to design and install a file-based newsroom solution to reach two objectives. The first was to replace the station's legacy tape-based system with a more flexible and efficient HD/SD tapeless system. A second objective was to provide an innovative solution to bridge the technological gap between the MOS-based ENPS newsroom computer system and Apple Final Cut Pro.

Working as a design team, KSTP broadcast engineers, Hubbard Broadcasting's IT department and Alpha Video engineers planned a completely tapeless, state-of-the-art newsroom. To seamlessly integrate more than a dozen Final Cut Pro workstations into the station's existing AP ENPS newsroom system, the team designed and installed a groundbreaking Gallery Sienna system. The system includes several Apple-based software modules for ingest, editing, asset management, playout and archive. The benefit of the system is it uses off-the-shelf computer hardware, including Apple Xserves and AJA Kona cards. The primary edit bays were outfitted with MacPro workstations running Final Cut Pro with the Sienna StoryCut Plug-in, allowing the editor to see the show rundowns and scripts within Final Cut Pro. Daily satellite and ENG ingest feeds are scheduled and recorded via Xserves controlled by the Sienna IngestControl module. These feeds are recorded directly to the shared storage and can be edited immediately on any of the Final Cut Pro editors, even while video is still recording.

Once the story is edited, the finished package is published to AutomationX, the Sienna rundown manager, which is dynamically synchronized via MOS and the ENPS server. AutomationX controls a group of Xserves with Kona cards for the playout channels. The content can be played directly from shared SAN volume, and it can be transferred to a separate SAN volume for failover.

The shared storage solution is the Apple certified Promise VTrack system with 160TB of online SAN storage using Apple XSAN 2 to connect all the editors and ingest/playout channels connected via 4Gb/s fiber switch from Qlogic. The archive solution for long-term storage of content is a SpectraLogic T380 LTO4-based system running XenData management software. The Sienna solution offers integrated archive tools and XenData supports features such as partial restore. Proxy video is created for all online and offline content, and users can easily restore video back into the online storage. The proxy video can be played on PCs and Macs through the integrated Web-based asset manager.

In addition to the Apple and Gallery Sienna integration, Alpha Video installed a multiformat Harris routing and master control system with Miranda terminal and conversion gear. One significant challenge to overcome was the implementation of Active Format Description (AFD) throughout both SDI and HD-SDI signal streams. The objective was to leverage as much SD-SDI while maintaining widescreen for the HD viewers. Miranda AFD inserters were used to differentiate 16:9 and 4:3 signals.

Sky News

Excellence Award category

Newsroom technology

Submitted by

BSkyB Technology

At Sky News, we went for a high-impact launch of our high-definition news channel, coinciding with the night of the UK general election. The biggest technical challenge was to keep the existing channel on-air and maintain high production standards, while preparing for the separate HD channel. We also set the task of presenting HD news in a new way.

For Sky News, the problems were matched by fantastic opportunities. It gave us the chance to take stock of our equipment and workflows, and to make some fundamental changes. In went new studio cameras, lighting, a gallery and a server system — just part of the newsroom transformation. For the server solution, we partnered with EVS.

During the HD upgrade, our main gallery was twice switched to a specially constructed temporary gallery. This happened once for a three-month refit and later during rehearsals. The countdown to that 9 p.m. launch carried the adrenalin-fueled hopes and fears of a project team who'd spent the previous 12 months meticulously planning for the night. Separate project teams were set up for key areas of technical implementation, and most of this work was kept in-house, drawing on the support of BSkyB's technology division.

The first creative step was to prioritize HD service over SD, which was crucial if we were to unleash the creative potential of the new format. Although driven by the same production stream, we developed separate screen architecture for HD and SD services, with the HD service liberated from the normal constraints of 4:3 safe. In addition, a whole new grammar was developed to provide additional content on side panels.

These premium panels are an innovative new way of storytelling for Sky News HD. They add compelling detail to our journalism, using the widescreen format of high definition to give rich context to the key stories of the day. The panels are producer-controlled graphics templates, which are triggered by codes in the rundown. They include live video, graphics, analysis and data during live, guest and breaking news.

At the heart of the brand identity is a 3D world of light and glass, and more than six months of high-end 3D work went into its execution. The channel has lost none of its immediacy, yet the graphic identity fully exploits the rich aesthetic potential of high definition and has undoubtedly changed our approach to design. We integrated Panasonic P2 (AJ-HPX2100) in the field, an EVS server system, Final Cut Pro editing, Avid iNEWS as the newsroom production tool and an Ardome Ardendo tapeless library system. Chyron equipment was predominantly used to run the panels. We have 40 lines coming in through our news operation center (NOC) and 16 recording lines. The NOC team can arc and amend feeds accordingly to comply with the 16:9 format.

Our philosophy is that we are now an HD channel that also does SD. Fortunately, because we are shooting in HD in the UK and around the world, and because we have transformed our entire newsroom infrastructure, we are able to deliver on this 21st century broadcast engineering challenge.

Design team

BSkyB Technology: David Tinney, mgr.; Bruce Kruger, mgr.; Oliver Pitkin, design; Peter Esdaile, proj. mgr.; Julian Wright, server; Stuart Ross, studios; Louis Starnwoski, graphics; Ann Chiang, transmission; Steve Tilston, server technology

Sky News: Bevan Gibson, tech. lead; Andrew Crofts, assistant; Richard Pattison, assistant; Clive Van Der Heever, assistant; Richard Westwood, assistant; Dustin Grubish, assistant; Simon Buglione, creative; Jon Bennett, studios; Jackie Faulkner, ops.; Steve Bennedik, proj. coord.

Technology at work

Apple: Final Cut Studio
Ardome: Ardendo tapeless library system
Avid: iNEWS newsroom computer system
Axon: Digital glue
Chyron: HyperX3 graphics with CAMIO cluster, LUCI system with Active X
Cisco: Infrastructure
Evertz: VIP multiview monitor and 3G router
EVS: ActiveX plug-in database browser, IP Director, Xedio HD and 200 +thin client browse tool, XS and XT[2] production servers, 200TB Xstore2 SAN
Grass Valley: K2 Summit servers for GFX playback, Kayenne switcher, LDK 8000 Elite WorldCam HD studio cameras
NVISION: HD router
Techex: HD in-house IPTV system
Vizrt: Graphics

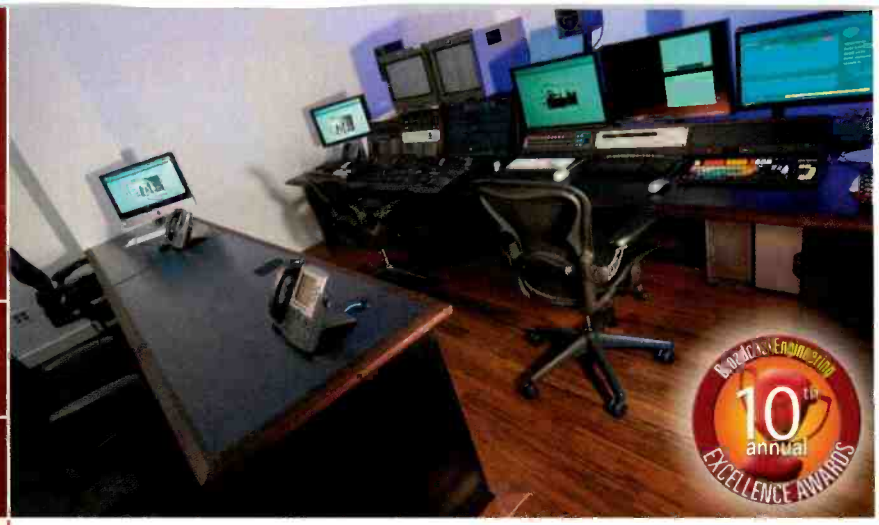
Company 3 and Method

Excellence Award category

Post & network production facilities

Submitted by

Ascent Media Systems Integration



Design team

Ascent Media: Stefan Sonnenfeld, SVP; Matthew McMurray, sr. proj. mgr.; Jack Dawson, VP facilities planning; Christopher Cuddihy, sr. dir. of implementation; Ken Brueck, proj. leader
CO3: Stefan Sonnenfeld, president and managing dir.; Marcelo Gandola, VP/dir. of ops. NY; Mike Chiado, VP/eng.; Rick Girardi, design eng.; Bill Topazio, design eng.; Liam Ford, design eng. support; Tim Dwight, design eng. support; Etienne Tomiak, assistant eng.
David Hotson Architect: David Hotson, architect; Mike Konow, architect
Lilker Associates
Method: David Toepfer, technical ops.

Technology at work

ARRI: Film Scanner
Autodesk: Flame, Inferno, Maya
Avocent: HMX system
Blackmagic Design: DaVinci Resolve color correctors
Brocade: FastIron SX800 switch
Digital Video Systems: CLIPSTER
Grass Valley: Concerto AES, Jupiter control, Trinix NXT 3G-SDI video, Venus RS422
Leibert: 80KVA UPS
SGI: InfiniteStorage 6700, RM660 storage

Ascent Media relocated its Company 3 and Method facilities to the New York City Chelsea area, a hotbed of production activity. Company 3 offers color correction, digital intermediate (DI) and file-based workflows to visual effects and online services. Method, a visual effects powerhouse, combines traditional filmmaking techniques with sophisticated 2D compositing and 3D animation.

The project included total renovation of two floors within a midrise building with a penthouse and outdoor patio addition. Company 3 is primarily located on the 12th floor and includes a DI theater with a Kinoton 35mm film projection and a Barco DP1500 2K projector. Method workstations are located on the 11th floor with connectivity to the central equipment room located on the 12th floor.

The facility complies with MPAA Content Security Best Practices. For example, there is physical separation of the production network from the business and VoIP network. Access throughout the facility is controlled by employee security cards. Video surveillance is maintained at a corporate level.

Film and tape stock movement is tightly controlled. There is a dedicated secure shipping and receiving area. The vault manager creates a log and assigns library shelf space. This area also contains space for film cleaning and scanning. Three Spirit SDC2000 and a Spirit 2K telecine are located on a different floor. The film movement between floors is tracked via bar-code scanning.

ARRI Film Scanners transfer film content to the digital domain. Data is sent to SGI's RM660 storage with Infinite 6700 supporting 4K, 2K and HD post-production processing. Data is available for DaVinci color correction, Autodesk Flame compositing and Inferno visual effects.

Final Cut Pros record video to the data storage for further processing such as color correction. They also provide output to videotape or file-based formats. Avid Media Composers allow delivery of DNX files. The Avid and FCP workstations are primarily used within the equipment room. However, using the KVM routing system, control and monitoring can be routed to any technical suite.

Grass Valley Trinix NXT 3G-SDI digital video routing is controlled via Jupiter LCD48 panels. A repurposed analog video router provides reference signal routing to support multistandard work. A two-level AES router is required since many products, such as color correctors, do not support embedded audio.

Avocent HMX KVM over IP switching provides flexible availability of production tools in the post suites without compromising user control and visual experience. Each suite has demarcation panels with HDMI and eight strands of fiber. These fiber strands appear on Hubbell OPTIchannel panels in the equipment center. All equipment slots are wired to support dual link. Flat bottom cable trays prevent cable deformation and subsequent signal anomalies.

The wiring and migration happened over a three-month period in collaboration with Ascent Media Systems Integration. More than 4000 cables were installed over six weeks. The actual relocation of the businesses occurred over multiple phases without any client downtime.

Photo courtesy Andy Washnik

Corus Quay

Excellence Award category

Post & network production facilities

Submitted by

The Systems Group

Corus Entertainment (Corus) is one of Canada's most successful integrated media and entertainment companies encompassing world-class animation studios; television service and radio station studio and production facilities; and sophisticated cablecasting master control facilities. Corus faced the challenge of segregated, operational work groups located in 11 disparate locations within the Toronto area and envisioned a single facility, known as Corus Quay, that would harness innovative technologies into a highly efficient, fully integrated, 100-percent digital infrastructure.

The Systems Group (TSG) was commissioned to execute the detailed design and integration of that vision to both support current operations and allow for future growth. It worked closely with Montana Engineering, Siemens, and the Corus Entertainment engineering and operational teams.

TSG specified and procured a range of equipment to satisfy the technical requirements of the new facility. Careful attention was paid during the detailed design and equipment specification processes to ensure that the diverse equipment would work flawlessly together as a single system while retaining the flexibility necessary for future growth. Evertz VistaLINK PRO was implemented as a complete and comprehensive entirely SNMP-based signal monitoring and equipment configuration solution along with EQX core routers with format-independent data paths, MVP multi-image display processors and 3G modular systems. RTS ADAM provided robust intercom functionality that can grow linearly as users are added. Extensive Avocent and Thinklogical KVM implementations were selected to support the various needs of the core infrastructure and post-production operations. NEC provided the monitor wall displays on TBC Consoles' support structure. Ikegami HDTV/SDTV multiformat LCD monitors were used in critical view environments. OmniBus iTX, a fully integrated, multiformat content delivery system, serves as the transmission technology. Videotek VTM series, Ward-Beck AMS and OmniTek OTR series monitoring products were used in test and measurement and QA stations.

An added challenge for TSG's design and implementation teams was the seamless integration of existing Corus equipment, such as Final Cut Pro and Digidesign components for 18 offline edit rooms, six online edit rooms and four voice-over booths, into the facility without disrupting ongoing operations. The design and integration efforts also incorporated Corus new purchases such as all 200 rack systems from EMF, as well as equipment for the two control rooms, including Ross Video switchers, Sony cameras and a Euphonix audio mixer. All servers and MAM technology were furnished by Corus and implemented under the control of Siemens IT Solutions and Services.

The new consolidated workplace facilitates efficiencies, economies of scale and redundancies not previously possible. John Cassaday, president and CEO, Corus Entertainment, recently stated, "Corus Quay gave us the opportunity to transform the operational and technological processes that underpin our business. Our fully integrated digital infrastructure provides Corus with the agility to respond to our customers' needs in a changing marketplace." ■

Design team

Corus Entertainment: Bruce Cowan, dir. of eng.; Kevin Harkins, technical lead-broadcast, post & production; Kevin Marchand, technical lead-media ingest, IT; Eugene Quon, technical lead-master control
Montana Engineering: Lou Montana, principal
Siemens IT Solutions and Services: Marcos Gonzalez-Flower, global head, media consulting
TSG: Chris Mehos, principal; Paul Rogalinski, exec. proj. mgr.; Frank Geraty, eng. mgr.; Dave Jennings, John Bunton, Krystina Jennings, Todd Pekala: design eng.; Craig Tabler, integration mgr.

Technology at work

Avocent: HMX KVM
AVP: Audio and video jackfields
Bose: 802 series 111 speakers
Euphonix: ML530 studio audio mixer
Evertz: 500, 3000, 7700, 7800 framed modular systems, EQX, MVP; VistaLINK PRO
Extreme: Summit IP switches
Harris: Videotek TVM and VTM series test and measurement
Ikegami: HLM series displays
NEC: P461 displays
OmniBus: iTX master control automation and playout
Quantel: EQ online edit systems
Ross Video: QMD 3ME production switchers, open gear modular
RTS: ADAM
Sony: LMD series monitors, Studio 1500 HD camera systems
Thinklogical: Velocity KVM
Ward-Beck: AMS16 series audio QC monitors

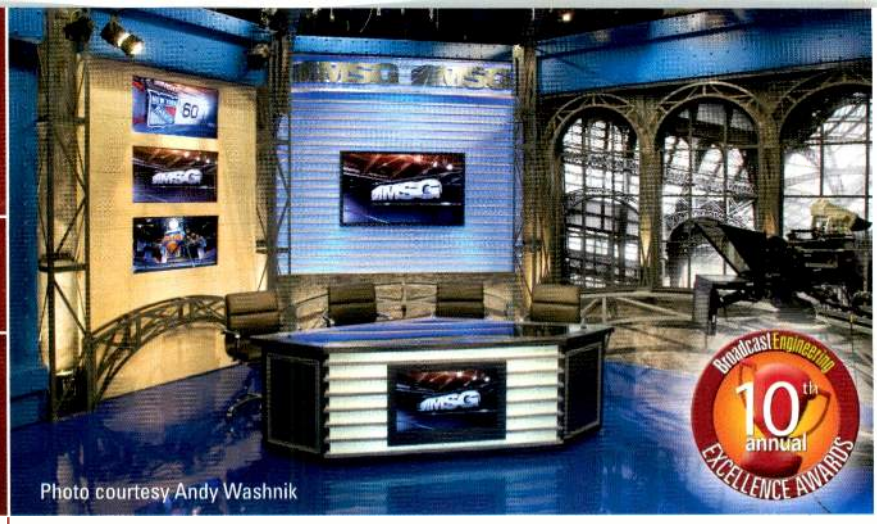
MSG Media

Excellence Award category

Post & network production facilities

Submitted by

The Systems Group



Design team

HLW International
MSG Media: Gerard Passaro, SVP network operations & dist.; Michael Mitchell, chief eng.
TSG: Scott Griffin, principal and VP eng. & tech.; Belinda Binkely, dir. proj. operations; James Tome, sr. sys. eng.; Christian Dam, sr. sys. eng.

Technology at work

Apple: Content creation system with XSAN and Final Cut Server automation
Avid: AirSpeed
Avocent: KVM platform
Canon: Lenses
Chyron: HyperX3 graphics
EVS: Production server
Flanders
Genelec: Speakers
Grass Valley: K2 server
Harris: 6800 series modular systems, CENTRIO multi-image processing, Nucleus and Navigator asset management, NEXIO server, Platinum routers, PPC and ICS playout and ingest control, Velocity nonlinear editing
Image Video: UMDs
Panorama TV
Riedel: Artist intercom
Samsung
Solid State Logic: C132 HDS mixers
Sony: HD studio cameras, MVS8000G switchers, monitors
TBC: Consoles
TV Logic
Wohler: Audio monitoring

For decades, the MSG Network was housed within the famous Madison Square Garden arena, in the heart of midtown Manhattan. As part of Madison Square Garden's ongoing transformation, MSG Media had the unique opportunity to build a first-class, state-of-the-art television facility. MSG Media spent the past year transforming the network into a fully high-definition, 3-D-ready facility with 3G infrastructure and extended tapeless workflows — all while maintaining continuous operations.

MSG Media turned to The Systems Group (TSG) to plan, design and implement the network transformation with an additional focus on completely integrated and enhanced production and post-production workflows. Expansion also included lighting dark fiber to interconnect the existing, temporary and planned Garden television broadcast service panels, announce positions, studios, and camera positions located throughout the arena to the mobile production truck dock, as well as to the production and post-production facilities built at 11 Penn. TSG worked closely with the MSG Media team to plan and create temporary workflows and systems that would ensure operational continuity during the multiple relocations.

Harris provided the majority of core infrastructure technology. MSG Media had previously replaced its SD server operations facility with Harris' high-definition NEXIO server and nonlinear editing system and used Harris to provide the glue for MSG Media's first local HD production control room. It was a natural progression to use Harris technology to light the large capacity dark fiber run to interconnect the Garden and 11 Penn facilities, as well as to interconnect the production, post-production, studios and rooftop camera systems located in 11 Penn. The project also provided the ideal opportunity to enhance the NEXIO server system with 64-bit technology, as well as to provide multiple playout and ingest control points and improve production and transmission server workflows. Harris also sourced a new digital signage platform for use at the Garden and 11 Penn Plaza and partnered with Dixon to create new digital logging capabilities to further reduce reliance on tape-based content.

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

The implementation of fiber optics into the heart of MSG Media provided a wide bandwidth that interconnects the Garden to 11 Penn via dual, diverse fiber connectivity; provides an all-HD environment with a 3-D-capable backbone; and streamlines MSG Media's content sharing between its interactive, creative and production teams, saving time and money. This bandwidth is maximized by the care taken to ensure that all the routing and "glue" were also capable of passing the bandwidths needed for 3-D production. MSG Media produced the first live-to-the-home 3-D hockey game earlier this year. ■

NY1

Excellence Award category

Post & network production facilities

Submitted by

Azzurro Systems Integration

Maintaining 100-percent operational capability during construction of its two new production control facilities was vital for NY1 News, Time Warner Cable's flagship news channel in New York City, but other requirements also ranked high on the priority list. The network was also determined to maximize resources and minimize budgets by repurposing existing systems to accommodate a new design.

This project required a complex coordination of efforts to integrate into an existing system without interruption. It was carried out in phases to allow NY1 to always have three of its four control rooms active during the renovation. NY1 opted to work with Azzurro Systems Integration (ASI). ASI commissioned a team of professionals with expertise in live environment system builds and responded with a detailed plan describing each task, a timeline defining expectations and a design taking full advantage of all available opportunities. Both rooms were built from the same plans with virtually identical equipment complements. Since the same crews and designs were used, economies of scale regarding drawings and cable run sheets were realized.

ASI located and protected any existing cabling deemed usable, and removed unusable equipment and wiring. Existing digital A/V routing switchers and demarcations were repurposed to suit the new configuration. Each room was fitted with a TBC console, a Sony 8000G switcher, a Wheatstone D8 audio mixer and Shotoku robotics. Monitoring was accomplished with eight 47in portrait-oriented displays fed by an Evertz MVP multiviewer system, each monitor fed with an independent output. These displays comprise the main monitor wall and provide program, preview and signal repeat monitoring. Several quad and dual LCD displays were installed at strategic locations in the consoles for isolated monitoring of VTRs and cameras. A 42in LCD display, also fed by the multiviewer, provides repeat monitoring for the audio operator.

Control Room N, the center for integration of daily programming elements, has the ability to monitor 56 inputs of which 16 are HD. AES/EBU digital audio and analog audio inputs accompany the video, as required. The configuration can be static or modified to accommodate changing needs. Where applicable, visual monitoring of audio is provided via a bar graph display overlaid on the video source. Wohler audio monitor panels provide confidence monitoring.

Critical signal measurement monitoring is accomplished via Harris rasterizers. Another rasterizer supplies critical signal quality control and troubleshooting. Six 19in LCD monitors located within the ceiling soffit facilitate competition monitoring. A Wheatstone D8 matrix-based audio mixer meets the current, as well as future, needs of NY1. Chyron LEX2 systems and Ross Video SoftMetal servers are available to the production switcher for graphic element integration. Each has its own keyboard, mouse and monitor wired through the new Avocent KVM switch to furnish maximum flexibility and redundancy. A Dalet newsroom automation system communicates with a Chyron LEX2 system for lower-third and full-screen graphics, and also with an Omneon server for playback, recording and trimming of video segments.

Design team

Azzurro Systems Integration: Marc Bressack, exec. VP; Bill McKnight, VP/GM; Scott Buchholz, dir. of eng.; Ray Bucceri, proj. eng.; Frank Riccardelli, proj. lead

NY1: Steve Paulus, RVP TWC local news division; Joe Truncale, VP ops. and eng.; Gunn Isarankura , sr. dir. of eng.; Michael Chan, sr. dir. of ops.; Brad Shapiro, sr. dir. of IT

Technology at work

Avocent: KVM switch
Chyron: LEX2 graphics
Evertz: MVP multiviewer
Harris: Rasterizers
Image Video: TSI-100 tally system
Ross Video: SoftMetal multichannel servers
Samsung: 19in displays
Shotoku: Robotic camera system
Sony: 8000G digital production switcher, 47in displays, 42in displays
TBC: Consoles
Wheatstone: D8 matrix-based mixer
Wohler: Audio monitors

SS32

Excellence Award category

Post & network production facilities

Submitted by

NEP Broadcasting

Design team

Engineered Mobile Solutions: Bryce Johnson, principal
ESPN: Steve Raymond, proj. eng.
NEP Systems Integration: Howard Naugle, Terry Kulchar and Mike Naugle, sys. design.; Scott Chaffo and John Fortunato, super. integration and mobile unit fit up
NEP Technology Office: George Hoover, CTO/proj. mgr.; Joe Signorino, proj. mgr.

Technology at work

Calrec: Alpha with Bluefin audio console
Cobalt Digital: Fusion terminal equipment
Evertz: EQX router, sync system
EVS: XT[2]+ servers
Fujinon: Lenses
PACE: 3-D rig technology
RTS: ADAM intercom
Sony: 3-D monitors, HDCP1 and HDC-1500 cameras, MVS-8000X production switcher
Vizrt: Graphics systems

In the fall of 2009, NEP Broadcasting released a grand experiment, SS3D, one of the first mobile production trucks geared toward live 3-D events. But, with the buzz around 3-D growing and productions moving from simple tests to large-scale, multicamera affairs that could rival the coverage of the largest 2-D productions, a highly sophisticated solution that could take live 3-D TV to the next level was becoming a necessity. As ESPN was gearing up to launch its own 3-D channel, the network approached NEP to develop what would become SS32, a new 3-D mobile production truck with the firepower to cover the largest events and the grace of integration to handle two discrete video feeds (left and right eye) seamlessly.

Building on its experience at some of the largest live 3-D events to date, NEP set to work building a new solution at its integration facility. Up to this point, 3-D shows were science projects — grand experiments with huge budgets. But, there was a need to make 3-D productions fit within 2-D schedules, including fast setup and teardown as well as reduced costs. Here, the design process focused on how to keep a 2-D workflow in a 3-D environment to accommodate for two distinct video signals while not disrupting the flow of production. So, NEP looked where this was already working: stereo audio. Using dual DAs, with left and right eye for each 3-D rig on the same card, left- and right-eye signals were positioned adjacent to each other in the patch fields and processors were paired, just like in stereo audio.

NEP designed the truck with a complete 3G 1080p infrastructure to take advantage of multiplexing left- and right-eye signals on one cable when equipment becomes available in the future. The Sony MVS8000X switcher was chosen for its huge number of inputs and the ability to process 3G signals, and Evertz was selected for routing, with full embedded audio processing. Cobalt Digital Fusion series up/down/crossconverters and color correctors were used for their features and 3G capability, and the truck carries EVS XT[2]+ servers with 3G capability as well.

One major challenge of the build was that most 3-D equipment was still in a prototype phase, and even more in the pipeline would not be available for months. This meant that the design needed to be adaptable and ready to work with the latest and greatest that was yet to come. This was accomplished by allocating as much spare space as possible in the racks for new 3-D gear to move in as it became available.

NEP also provided 42in program and preview monitors, the biggest they dared install in the monitor wall of a truck, to give the production team an experience close to the home viewer's. This was key because 3-D shooting techniques are dependent on screen size: What may look good on a 24in display won't always translate well to a theater-size screen.

Telepictures

Excellence Award category

Post & network production facilities

Submitted by

Diversified Systems

Diversified Systems worked with Telepictures to do a facility upgrade at its Victory Studios location in Glendale, CA, for the "Extra" news show. The project combined a sophisticated HD upgrade with a migration to full file-based workflow. Included in the HD build out were the equipment room, production Control Room A, video control room, three ingest rooms and 15 Avid Media Composers.

The project consisted of an upgrade to HD involving a complete rebuild of the production control room as well a new IT infrastructure to support the workflow. An additional challenge included an aggressive timeline. The project started up in April, and "Extra" went to air in September. In a little more than five months, the entire system was designed, installed, commissioned and launched, all while keeping the existing SD system running and on-air.

Production Control Room A was completely rebuilt from the ground up to accommodate the new Grass Valley Kayenne HD production switcher. Three Sony HDC1400R HD cameras were provided for studio production. The signal infrastructure was designed and built around the Evertz EQX HD/SDI router using X-Link to drive the multiviewer displays in production control and ingest, combined with the new Evertz EMR AES/analog router. The EMR router provides for any discreet audio source to be embedded or de-embedded within the router itself, thus eliminating the need for any external embedders and de-embedders.

Telepictures standardized on all content being ingested into the servers in XDCAM 50Mb long GOP. Omneon servers provided a common platform for ingest and storage. The server system consists of 12 channels of Spectrum server space with two MediaStore storage arrays with 7TB of expandable storage.

But this was much more than a high-end HD upgrade. The post-production side of this project consisted of moving the client from a tape-based workflow to a workflow that was totally file based using Avid ISIS/Interplay. The post-production build out consisted of 15 Avid edit bays tied to the ISIS. The central storage unit of the ISIS stores all content that is edited in the bays, eliminating the need for local storage.

All clips are available to the editors and producers throughout the production cycle. As content is ingested into the Omneon MediaStores, it is simultaneously transferred into the ISIS via MOG SPEEDRAIL as a rewrapped MXF file. The SPEEDRAIL ingest tool rewraps the MXF OP1A file into OPAtom and creates a metadata file that references the ingested clip. The file is available immediately for the editors to start working on. This allows the editor to preview, log and edit while the recording is still happening.

The end result was an on-time switchover of both the HD production system and the new file-based workflow.

Design team

Avid: Todd Smelser, proj. mgr.
Diversified Systems: Duane Yoslov, sr. VP ops.; Mark Sackett, proj. mgr., sr. eng.; Alan Bourke, lead eng.; Todd Pekala, sr. eng.; Larsen Cottrell, install. super.
"Extra:" Meredith Fox, exec. in charge of prod.
Telepictures: Pat Brennan, dir. of eng.; Jason Schroeder, sr. broadcast eng.; John Ankwicz, exec. VP; DJ Birnbaum, dir. of prod.
Teleproductions/Universal: Chris Circosta, VP of prod.

Technology at work

Avid: ISIS/Interplay file-based workflow, Media Composer editing software
Evertz: EQX router, terminal equipment, X-Link
Grass Valley: Kayenne production switcher
Omneon: MediaStore server
Sony: HDC1400R cameras

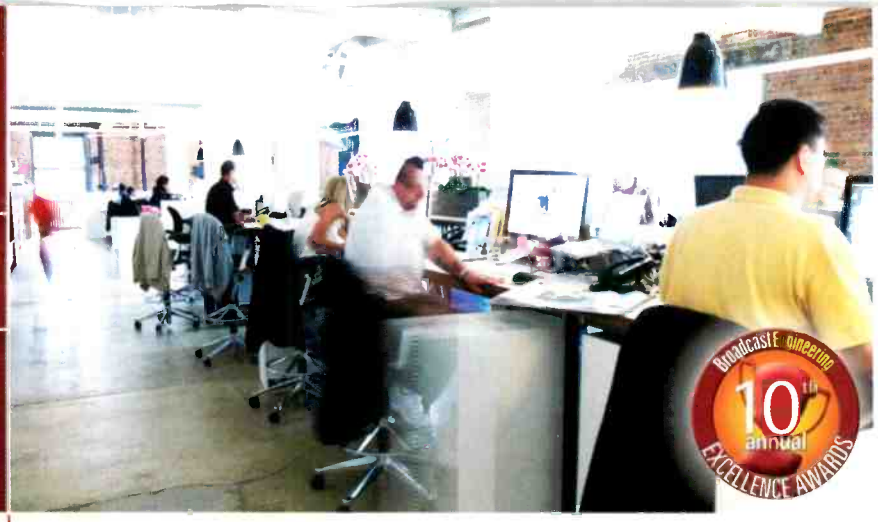
thelab

Excellence Award category

Post & network production facilities

Submitted by

Control Group



Design team

Control Group: Scott Anderson, partner; David Rocamora, sr. consultant; Charlie Miller, sr. consultant; Erik Childs, eng.; Ivan Wright, eng.; Stephen Cheevers, proj. group director; Miles Green, dir. of network eng.
thelab: Tom Conti, COO, exec. VP; Steven Ting, dir. of IT; Rob Pepe, dir. of oper.; Julian Schlaver, chief strat. officer, VP

Technology at work

Adobe: After Effects
Apple: Mac Pro workstations, Xserve servers, Xsan clients, Final Cut Pro, Final Cut Server, Compressor software
Autodesk: Maya
BOXX Technology: RenderBOXX servers
eyeon Software: Fusion
Prime Focus Software: Deadline
Promise: VTrak RAIDs
QLogic: SANbox 5802v 8Gb Fibre-Channel switches
Quantum: StorNext StorageManager, Scalar i500 tape library
Telestream: Episode Engine
V-Ray: Rendering engine

In January of 2010, thelab, a media arts company that creates and produces content for broadcast, print and interactive media, found out that its client BBH had been selected to produce 360-degree advertising for General Motor's luxury brand, Cadillac. The project was expected to generate a torrent of 4K RED files, which would need to be processed fast.

Anticipating the impact of this dramatic increase in file volume, thelab's director of technology, Steve Ting, sought a more efficient way to ingest, manage and edit assets, starting with 30TB of footage generated during the first shoot. To design and implement a solution that would dramatically increase thelab's ability to store, process and render vast amounts of content, Ting engaged technology firm Control Group and challenged it to do it in less than 60 days.

The solution was a high-performance SAN, which enabled administrators to create and partition additional storage containers without having to bring in additional, disparate systems. Running on top of the SAN was StorNext, a crossplatform, clustered file system that allowed clients running any OS to collaborate on large media files, eliminating slow network transfers and the need to duplicate data.

Amping up rendering capabilities was a BOXX Technologies render farm solution managed by Deadline render management software. The BOXX solution centralized rendering for 3-D and 2-D files, allowing a variety of media file types to be rendered on the same hardware. The result was a decrease in render times for some scenes from 12 hours to just two.

Control Group also expanded thelab's existing GigE infrastructure and installed additional QLogic Fibre-Channel switches for the SAN, providing the higher port density and additional bandwidth necessary to support the new services.

Mac workstations were connected to the SAN over Fibre Channel using Apple's Xsan software, while the group's Windows workstations and render farm accessed the file system over Ethernet using the StorNext Distributed LAN Client (DLC) software. The software allowed the machines to be native StorNext clients with high-bandwidth access to storage over thelab's existing Ethernet infrastructure, reducing the amount of new fiber cabling required.

Enhancing StorNext was Storage Manager, which provided advanced hierarchical storage management capabilities as well as full support for automatic migration of data between disk, tape and archive tiers based on business rules. To streamline editorial workflow, Control Group installed Final Cut Server (FCS), enabling asset management, file organization, versioning, searching, check-in/check-out and online/offline workflow. FCS provides normalization of all video to a common working format. Integrated with an Episode Engine cluster, FCS enabled seamless centralized transcoding for delivery to a variety of video and codecs without sapping processor power from editor workstations.

The new platform enabled thelab to produce a 30-second spot for the 2010 Cadillac CTS-V, from shoot to finish, in just 25 days.

Trinity Music City

Excellence Award category

Post & network production facilities

Submitted by

TV Magic

Over the last several years, Trinity Broadcasting Network (TBN) has been converting its large production facilities from SD to HD. This year, TBN and integrator TV Magic completed the upgrade of TBN's Trinity Music City (TMC) facility in Hendersonville, TN, from SD analog to HD.

The goals of the project included the ability to produce high-quality HD Christian and family entertainment, quickly change between setups at the touch of a button, and be the first TBN facility to go tapeless.

The design was meticulously planned for nearly three years. Rooms were reconfigured to make each larger. The design goal was to accommodate a complex, large-scale crew requiring up to 20 technicians in the control areas and also configure the rooms quickly for smaller productions requiring a maximum of four people. Most rooms in the industry are designed for one specific purpose. This facility had to serve small and large in-house productions, outside clients and producers that TBN partners with to create specials. The TMC facility has the most flexible control rooms in the broadcast industry as any outside producer can come in and configure the rooms however they wish with nearly no limitations.

One of the greatest innovations of the TMC facility is the "sliding switcher" design. For some simple productions, TBN wanted the director to also act as technical director and operate the switcher in the center of the console. For other complex productions, the switcher needs to be to the far right side of the console with a TD and then the director in the center of the console. The original plan was to install a Grass Valley Kalypso switcher, but that proved problematic due to the weight and physical size of the control surface. The decision was made to go with the new Grass Valley Kayenne switcher. The facility designers worked in cooperation with Laguna designs and built a console that allows the switcher control panel to physically "slide" to whatever configuration is best. To the design team's and Grass Valley's knowledge, this had never been done before.

Workflow has been greatly improved with the move to a tapeless environment. Even though the facility is split up in three different buildings, content seamlessly moves from production to post and back. The EVS system has the IP edit option, so simple show fixes can be made without having to use the already very in demand post-production suites.

The facility is so advanced that video clips played at a dinner recently hosted at the facility for community leaders were all controlled by an engineer while sitting with his wife at a dinner table at the event. He was able to transition from logos to roll ins and back using his laptop to fire macros on the Kayenne and roll clips off the EVS. This was all accomplished with no one in the control rooms.

Design team

Trinity Broadcasting Network: Paul Crouch, jr. chief of staff; Ben Miller, VP eng.; Russell Hall, Eastern reg. dir.; Dalin O'Bryan, chief eng., Greg Malenovsky, eng./audio

TV Magic: Nequin Scott, design eng; Gus Allmann, chief eng; Richard Craig, proj. eng.; Stephen D. Rosen, sales eng.

Technology at work

Apple: Final Cut
Avid: Edit system
Canon: Lenses
Deko: CG graphics
EVS: Tapeless capture and playback
Grass Valley Group: Kayenne production switcher, Trinix router
Ikegami: Cameras
Laguna Designs: Control consoles and furniture
Marshall: In-monitor display independent monitors
Miranda: Multiviewers
Pro Tools: Multitrack audio capture system
Riedel: Wireless comm.
RTS: Cronus comm. systems
Soundcraft: Vi6 house and monitor mix consoles
Studer: Vista 8 air mix console

UM-HD1

Excellence Award category

Post & network production facilities

Submitted by

TV Globo

Design team

TV Globo: Paulo Rabello, proj. dir.; Flavio Mauro, proj. mgr.; Julio Lima, proj. coord.; Geraldo Correa, electrical proj. mgr.; Anderson Viana, proj. eng.; Andre Camilo, proj. eng.; Nelson Nicolini, proj. eng.; Rodrigo Ferreira, proj. eng.; Sergio Garcia, proj. eng.; Thiago Abreu, proj. eng.; Flavio Vilarinho, AV inst. sup.; Lutgardes, electrical inst. sup.; Monica Queiroz, product and accessory design; Andre Soler, product and accessory design

Technology at work

Chyron: HyperX3
Clear-Com: Eclipse-Omega matrix intercoms
Evertz: VIP-DUO multiviewer and HD-2020 processors
EVS: IP Director, XT[2] servers
Harris: Routing system, modulars
Image Video: Automation
Orad: Trackvision
Sony: BVM, PVM and Luma series monitors; HDC-1500 and HDC-3300 cameras; MVS-8000G and MVS-8000GSF switchers; PDW-1500HD optical decks
Studer: Vista 8
Trinnov: Optimizer audio monitoring
TSL: Audio monitoring

UM-HD1 is the newest TV Globo production trailer mainly designed to cover shows and big sports events. The imposing white structure — 55ft long, 13ft high and 39 tons of weight, with rear and right side expansions — make it the biggest mobile unit (MU) below the equator line. The layout was optimized to comfortably accommodate 36 operational personnel and to attend two simultaneous and/or independent productions.

The system, fully compliant with SMPTE specs for full HD productions (1080/60p @ 3Gb/s), was conceived to manipulate video with eight embedded audio channels and has the capability to receive multiple discrete feeds to interface with legacy field equipment. The system supports 46 feeds in total (24 cameras with CCU, two microlinks, four microcameras and up to 16 processed external feeds).

As part of the plan for pre-integration with TV Globo personnel during the shell construction, we built a wood platform the same size of the chassis to cut the cables and preconnect patch panels. The strategy saved considerable time and increased the cabling quality as installers had wider working space than the MU's space constraints. In order to achieve maximum operational space and proper installation for equipment, the project team designed and manufactured every console, rack, monitor wall and equipment accessory.

Because the project started in the beginning of 3Gb/s developments, the infrastructure implementation was another huge challenge. Many studies were carried out in order to understand the technological challenges faced. These studies made it possible to identify and tackle the incompatibilities between SMPTE-425M level A/B. We also realized that major vendors were choosing only one level at their convenience. Based on this information, we started work with manufactures to convince them to support both levels or at least Level B. After this long process, the companies decided to incorporate both levels on their product lines, which certainly brought benefits for the whole broadcasting market. The outcome was an infrastructure prepared for level A/B.

Regarding audio operation, we specified a system that analyzes and corrects audio monitoring, compensating the distortions produced by the room's acoustics and thereby improving significantly the quality of mixing and recording.

The innovations were also present on the power system; the design allowed power lines, racks and consoles monitoring. In case of any component failure or power outage, the system generates alarms on a Human-Machine Interface, permitting a quicker and easier troubleshooting and intervention. This is the first trailer with 60KVA no-breaks hooked-up in shunt mode, providing approximately 10 minutes of power autonomy.

The biggest challenge was during Rio de Janeiro's 2010 Carnival, TV Globo's most complex event. The UM-HD1 system proved to be so compact, versatile and reliable that it alone produced the same event previously done with two MUs of similar size. ■

A

AccuWeather Inc
State College, PA
Web: www.accuweather.com

Acoustics First Corp
2247 Tomlyn St
Richmond, VA 23230
Tel: 804-342-2900
Toll Free: 888-765-2900
Fax: 804-342-1107
E-mail: info@acousticsfirst.com
Web: www.acousticsfirst.com
Contact: Becky Colleran

Actus Digital
Tel Aviv, -, Israel
Tel: +972-3-769-4737
Web: www.actusdigital.com

ADC
Minneapolis, MN
Tel: 800-366-3889
Web: www.adc.com

AJA Video Systems
180 Litton Dr
Grass Valley, CA 95945
Tel: 530-274-2048
Fax: 530-274-9442
E-mail: sales@aja.com
Web: www.aja.com
Contact: Sls.
AJA Video is a leading manufacturer of high-quality and cost-effective digital video interface, conversion and Desktop solutions supporting the professional broadcast and post-production markets.

Alcatel-Lucent
Plano, TX
Tel: 800-252-2835
Web: www.alcatel-lucent.com/microwave

Alteran Technologies
Chatsworth, CA
Tel: 818-998-0100
Web: www.alterantechnologies.com

Antenna ID Products
Glenmoore, PA
Tel: 610-458-8418
Web: www.antennaid.com

Anton/Bauer Inc
Shelton, CT
Tel: 800-541-1667
Web: www.antonbauer.com

Apantac LLC
Portland, OR
Tel: 503-968-3000
Web: http://www.apantac.com

ARG Electrodesign Ltd
Cirencester, Gloucestershire,
United Kingdom
Tel: +44 1285 658501
Web: www.arg.co.uk

ARRI Inc
Blauvelt, NY
Tel: 845-353-1400
Web: www.arri.com

ATCi
Chandler, AZ
Tel: 480-844-8501
Web: www.atci.com

ATTO Technology
Amherst, NY
Tel: 716-691-1999
Web: www.attotech.com

Audemat-Aztec
Miami, FL
Tel: 305-249-3110
Web: www.audemat.com

Audio-Technica US Inc
Stow, OH
Tel: 330-686-2600
Web: www.audio-technica.com

Autoscript Inc
Shelton, CT
Tel: 203-926-2400
Web: www.autoscript.tv

Avid Technology
Tewksbury, MA
Tel: 800-949-2843
Web: www.avid.com

Aviom Inc
West Chester, PA
Tel: 610-738-9005
Web: www.aviom.com

Avitech International Corporation
Redmond, WA
Tel: 425-885-3863
Web: www.avitechvideo.com
Avitech designs, develops and manufactures multiviewers for a broad range of customers in the broadcast, professional A/V, security and IT industries. Our open and distributed architecture solutions have served customer needs from office presentations to mission-critical broadcast control room applications. We provide affordable, reliable solutions to complex problems in a dynamic market.

Axcera
Lawrence, PA
Tel: 800-215-2614
Web: www.axcera.com

Axon Digital Design BV
Gilze, Netherlands
Tel: +18667579890
Web: www.axon.tv

Azden
Franklin Square, NY
Tel: 800-247-4501
Web: www.azdencorp.com

COMPANY DIRECTORY

Azzurro Systems Integration
Northvale, NJ
Tel: 201-767-0850
Web: www.azzurrosi.com

B

Band Pro Film & Digital Inc
Burbank, CA
Tel: 818-841-9655
Web: www.bandpro.com

Barco Visual Solutions LLC
Duluth, GA
Tel: 770-218-3200
Web: www.barco.com

Baron Services
Huntsville, AL
Tel: 256-881-8811
Web: www.baronservices.com

Belden
Richmond, IN
Tel: 800-235-3361
Web: www.belden.com

beyerdynamic - USA
Farmingdale, NY
Tel: 800-293-4463
Web: www.beyerdynamic-usa.com

Bird Technologies Group/TX RX Systems
Solon, OH
Tel: 866-695-4569
Web: www.bird-technologies.com

BitCentral Inc
Newport Beach, CA
Tel: 949-253-9000
Web: www.bitcentral.com

Bittree
Glendale, CA
Tel: 800-500-8142
Web: www.bittree.com

Blackmagic Design
Milpitas, CA
Tel: 408-954-0500
Web: www.blackmagic-design.com

Boinx Software
Puccheim, Germany
Tel: 49 89 84 00 55 00
Web: www.boinx.com

BOXX Technologies
Austin, TX
Tel: 512-835-0400
Web: www.boxxtech.com

Brick House Video
Owslebury, Hampshire, United Kingdom
Tel: +44 1962 777733
Web: www.brickhousevideo.com

Bridge Technologies
Oslo, Oslo, Norway
Tel: +47 22 38 51 00
Web: http://www.bridgetech.tv/

Broadcast Microwave Services
Poway, CA
Tel: 800-669-9667
Web: www.bms-inc.com

Broadcast Pix
Billerica, MA
Tel: 978-600-1100
Web: http://www.broadcastpix.com/

BroadcastStore.com
Chatsworth, CA
Tel: 818-998-9100
Web: www.broadcaststore.com

Broadcast Video Systems Corp (BVS)
Richmond Hill, ON, Canada
Tel: 905-305-0565
Web: www.bvs.ca

BUF Technology
San Diego, CA
Tel: 858-451-1350
Web: www.buftek.com

C

Calrec Audio Ltd
Hebden Bridge, United Kingdom
Tel: +44 1422 842159
Web: www.calrec.com

Canare Corp of America
San Fernando, CA
Tel: 818-365-2446
Web: www.canare.com

Census Digital
Toronto, ON, Canada
Tel: 416-850-0071
Web: www.censusdigital.com

Century Optics
Van Nuys, CA
Tel: 818-766-3715
Web: www.schneideroptics.com

Chyron
Melville, NY
Tel: 631-845-2051
Web: www.chyron.com

CineBags Inc
Glendale, CA
Tel: 818-662-0605
Web: www.cinebags.com

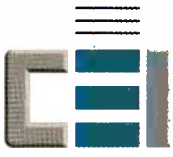
Clark Wire & Cable
Mundelein, IL
Tel: 800-222-5348
Web: www.clarkwire.com

Class on Demand
Hoffman Estates, IL
Tel: 847-843-9939
Web: www.classondemand.com

Clear-Com Communications
Alameda, CA
Tel: 510-337-6600
Web: www.clearcom.com

Cobalt Digital Inc.
Urbana, IL
Tel: 800-669-1691
Web: www.cobaltdigital.com

Cobham
Carlsbad, CA
Tel: 888-880-9339
Web: www.cobham.com/gms



Communications Engineering
Newington, VA
Tel: 703-550-5800
Web: www.commeng.com
Communications Engineering, Inc. (CEI) is a leading, award-winning broadcast and multi-media systems integrator. The company also offers complete equipment service, support and training, and supplies products and services to a wide range of commercial clients and non-profit businesses. Federal agencies and government organizations can be supplied through GSA.

Communications Specialties Inc
Hauppauge, NY
Tel: 631-273-0404
Web: www.commspecial.com

Compix Media Inc
Irvine, CA
Tel: 949-585-0055
Web: www.compix.tv

Comtech EF Data
Tempe, AZ
Tel: 480-333-2200
Web: www.comtechefdata.com

Comtech Xicom Technology Inc
Santa Clara, CA
Tel: 408-213-3000
Web: www.xicomtech.com

Consumer Electronics Assn
Arlington, VA
Web: www.cesweb.org

CPC-Computer Prompting & Captioning
Rockville, MD
Tel: 800-977-6678
Web: www.cpcweb.com

Crispin Corp
Durham, NC
Tel: 919-845-7744
Web: www.crispincorp.com

Crystal Vision Ltd
Cambridge, Cambs, United Kingdom
Tel: +44 1223 497049
Web: www.crystalvision.tv

D

Dalet Digital Media Systems
New York, NY
Tel: 212-269-6700
Web: www.dalet.com

Delec
Atlanta, GA
Tel: +49 6351 1317 0
Web: www.delec.de

DFT Digital Film Technology
Weiterstadt, n/a, Germany
Tel: 818-288-5503
Web: www.dft-film.com

Dielectric Communications
Raymond, ME
Tel: 800-341-9678
Web: www.dielectric.com

Digital Rapids
Markham, ON, Canada
Tel: 905-946-9666 ext 212
Web: www.digital-rapids.com

Digital Alert Systems LLC
Oracle, AZ
Tel: 520-896-0303
Web: www.digitalalertsystems.com

Digital Broadcast
Gainesville, FL
Tel: 352-377-8344
Web: www.digitalbcast.com

Discount Video Warehouse
Mt Prospect, IL
Tel: 800-323-8148
Web: www.dvwonline.com

DK-Technologies America
Santa Clara, CA
Tel: 800-421-0888
Web: www.dk-technologies.com

DMT USA
Horsham, PA
Tel: 888-912-TEAM
Web: www.dmtonline.us

Dolby Laboratories Inc
San Francisco, CA
Tel: 800-33D-OLBY
Web: www.dolby.com

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

DSC Laboratories
Mississauga, ON, Canada
Tel: 905-673-3211
Web: www.dsclabs.com

DVEO div of Computer Modules Inc
San Diego, CA
Tel: 858-613-1818
Web: www.dveo.com

E

EditShare
Boston, MA
Tel: 617-782-0479
Web: www.editshare.com

ELBER SRL
Carasco (GE), Italy
Web: http://www.elber.eu

Electronics Research Inc
Chandler, IN
Tel: 812-925-6000
Web: www.eriinc.com

Electrosonic Inc
Burbank, CA
Tel: 888-343-3602
Web: www.electrosonic.com

COMPANY DIRECTORY

EMCEE
Tempe, AZ
Tel: 480-315-9283
Web: www.emceecom.com

Enco Systems
Southfield, MI
Tel: 800-362-6797
Web: www.enco.com

Enhance Technology Inc
Santa Fe Springs, CA
Tel: 562-777-3488
Web: www.enhance-tech.com

Ensemble Designs
PO Box 993
Grass Valley, CA 95945
Tel: 530-478-1830
Fax: 530-478-1832
E-mail: sales@ensembledesigns.com
Web: www.ensembledesigns.com
Contact: Mondae Hott, Director of Sales

ESE
142 Sierra St
El Segundo, CA 90245
Tel: 310-322-2136
Fax: 310-322-8127
E-mail: ese@ese-web.com
Web: www.ese-web.com

Evertz
5292 John Lucas Dr
Burlington, ON
L7L 5Z9 Canada
Tel: 905-335-3700
Fax: 905-335-3573
E-mail: sales@evertz.com
Web: www.evertz.com

Evertz' head office is located in Burlington, Canada. Evertz has additional worldwide locations including divisions in Burbank CA, Dubai, Hong Kong, New York, Reading UK, and Washington DC.

Evertz maintains its position as one of the leaders in the digital broadcast industry by providing the most complete HD, 3G, and 3D solutions:

- *Multiviewers*
- *Routers*
- *Master sync generation*
- *3D*
- *Fiber optics & RF*
- *Monitoring & Control*
- *Post-Production*
- *Closed captioning*
- *MPEG2, H.264 JPEG2000*
- *Master Control & Branding*
- *Media Servers*

EVS Broadcast Equipment
Ougree, Belgium
Tel: +32 4 361 7000
Web: www.evs.tv

Eyeheight Ltd
Watford, Hertfordshire, United Kingdom
Tel: 866 469 2729

F

Fischer Connectors
Alpharetta, GA
Tel: 800-551-0121
Web: www.fischerconnectors.com

Florical Systems Inc
Gainesville, FL
Tel: 352-372-8326
Web: www.florical.com

FOR-A America
Fort Lee, NJ
Tel: 201-944-1120
Web: www.for-a.com

Forecast Consoles Inc
Hauppauge, NY
Tel: 800-735-2070
Web: www.forecast-consoles.com

Front Porch Digital
Louisville, CO
Tel: 303-440-7930
Web: www.fpdigital.com

Fujinon Inc
Wayne, NJ
Tel: 972-385-8902
Web: www.fujinon.com

Full Compass Systems Ltd
Madison, WI
Tel: 800-356-5844
Web: www.fullcompass.com

Future Media Concepts
New York, NY
Tel: 212-233-3500
Web: www.fmctraining.com

G

Gennum, Video Products Div
Burlington, ON, Canada
Tel: 905-632-2996
Web: www.gennum.com

Gepco Intl Inc
Des Plaines, IL
Tel: 800-966-0069
Web: www.gepco.com

Grass Valley
Nevada City, CA
Tel: 800-547-8949
Web: www.grassvalley.com/sales
When the world is watching... we're there.

For more than 50 years, Grass Valley has been, and continues to be, at the forefront of an on-air innovation, creating some of the most accomplished products and services available in the market. With hundreds of patents with many representing the most fundamental technologies that drive our industry numerous Emmy® Awards, and countless other industry accolades, today's Grass Valley is built from best-of-breed pioneers making it the most progressive video equipment manufacturer and solutions provider in the industry. Grass Valley is also the only manufacturer providing equipment throughout the entire content creation, management, and distribution chain from cameras to switchers, servers and editors.

When you're watching news, sports, or entertainment programming, whether on TV, the Web, or a mobile phone, you're watching Grass Valley at work.

H

Hamlet USA at SENCORE Inc
Sioux Falls, SD
Tel: 866-4-HAMLET (426-538)
Web: www.hamlet.us.com; www.sencore.com

Heartland Video Systems
Plymouth, WI
Tel: 800-332-7088
Web: www.hvs-inc.com

Hewlett-Packard, Rack & Power Infrastracture Group
Houston, TX
Tel: 800-282-6672
Web: www.hp.com/go/infrastructure

Horita Co
Mission Viejo, CA
Tel: 949-489-0240
Web: www.horita.com

I

Iconix Video Inc
Santa Barbara, CA
Tel: 800-783-1080
Web: www.iconixvideo.com

IDX System Technology, Inc.
Torrance, CA
Tel: 310-328-2850
Web: www.idxtek.com

Ikegami Electronics
Maywood, NJ
Tel: 800-368-9171
Web: www.ikegami.com

Image Video
Toronto, ON, Canada
Web: www.imagevideo.com

Intelsat
New York, NY
Tel: 212-839-1800
Web: www.intelsat.com

IPV
Cambridge, United Kingdom
Tel: +44 1223 477 000
Web: www.ipv.com

Isilon Systems
Seattle, WA
Tel: 206-315-7588

ISIS Group
Grass Valley, CA
Tel: 888-622-4747
Web: www.isis-group.com

J

Jampro Antennas Inc
Sacramento, CA
Tel: 916-383-1177
Web: www.jampro.com

JDSU
Indianapolis, IN
Tel: 800-478-4424
Web: www.jdsu.com

K

K5600 Inc
N Hollywood, CA
Tel: 800-662-5756
Web: www.k5600.com

Kathrein Scala Div
Medford, OR
Tel: 541-779-6500
Web: www.kathrein-scala.com

Kino Flo
Burbank, CA
Tel: 818-767-6528
Web: www.kinoflo.com

K-Tek
Vista, CA
Tel: 760-727-0593
Web: www.ktekbooms.com

L

Larcan USA
Lafayette, CO
Tel: 303-665-8000
Web: www.larcan.com

Lawo North America
Toronto, QC, Canada
Tel: 888-810-4468
Web: www.lawo.ca

COMPANY DIRECTORY

architecture • design • management

Lawson & Associates Architects
Bethesda, MD
Tel: 301-654-1600
Web: www.lawsonarch.com
Lawson has specialized in design for the broadcast industry for over 20 years. Projects range in scale from updated control rooms to multi-phase master plans. Our extensive experience within the broadcast industry allows us to satisfy the specific needs of every client, from initial drawings to final build. For more information please contact Bruce Lawson.

Leader Instruments
Cypress, CA
Tel: 800-645-5104
Web: www.leaderusa.com

Lectrosonics
Rio Rancho, NM
Tel: 800-821-1121
Web: www.lectrosonics.com

Leightronix
Holt, MI
Tel: 800-243-5589
Web: www.leightronix.com

Linear Acoustic
Lancaster, PA
Tel: 888-292-3117
Web: www.linearacoustic.com

Linear Industries Inc
Elgin, IL
Tel: 877-428-5793
Web: www.linear-tv.com

Linear Industries, Inc.
Elgin, IL
Tel: 877-428-5793
Web: www.linear-tv.com

Litepanels Inc
Van Nuys, CA
Tel: 818-752-7009
Web: www.litepanels.com

Logitek Electronic Systems
Houston, TX
Tel: 800-231-5870
Web: www.logitekaudio.com

LYNX Technik Inc.
Santa Clarita, CA
Tel: 661-251-8600
Web: http://www.lynx-technik.com

M

MagicBox Inc
Corvallis, OR
Tel: 541-752-5654
Web: www.magicboxinc.com

Marshall Electronics
El Segundo, CA
Tel: 800-800-6608
Web: www.lcdracks.com

MATCO
Los Gatos, CA
Tel: 800-348-1843
Web: www.matco-video.com

Matrox Electronic Systems, Video Products Group
Dorval, QC, Canada
Tel: 800-361-4903
Web: www.matrox.com/video

Maxell
Fair Lawn, NJ
Tel: 800-533-2836
Web: www.maxellpromedia.com

MCN Cabling LTD
Saskatoon, SK, Canada
Tel: 306-664-6262
Web: www.mcncabling.com

Media Broadcast
Freiburg, Germany
Tel: +49 761 590 14234
Web: www.t-systems-mediabroadcast.com

Microwave Radio Communications
Billerica, MA
Tel: 978-671-5700
Web: www.mrcbroadcast.com

Microwave and RF Resources
Kennewick, WA
Tel: 509-585-9377

Middle Atlantic Products
Fairfield, NJ
Tel: 800-266-7225
Web: www.middleatlantic.com

Miller Camera Support
Cedar Grove, NJ
Tel: 973-857-8300
Web: www.millertripods.com

Miranda Technologies
125 Crown Point Ct
Grass Valley, CA 95945
Tel: 530-265-1000
Fax: 530-265-1010
E-mail: ussales@miranda.com
Web: www.miranda.com
Miranda has a proven track record in delivering products which streamline operations, and enhance revenues at television facilities. Multiple new solutions include IT-based automation and playout, advanced playout monitoring with lip-sync detection, and routing with integrated audio processing. There's also automatic loudness control, and master control with advanced Dolby processing.

Multidyne Video & Fiber Optic Systems
Locust Valley, NY
Tel: 800-488-8378
Web: www.multidyne.com

MyersInformationSystems
BROADCAST MANAGEMENT SOLUTIONS

Myers Information Systems
Northampton, MA
Tel: 413-585-9820
Web: www.myersinfosys.com

Myers information Systems, Inc. provides a centralized, traffic, scheduling, programming, sales management and operational solution to broadcast and narrowcast media environments. Myers' ProTrack modular broadcast management software suite integrates with existing infrastructures and third?party systems, such as: automation, archive, accounting, PSIP, web and proprietary internal databases to ensure optimal workflow efficiency and maintain current investments.

Myers information Systems, Inc. offers comprehensive solutions for traffic, scheduling, programming, and sales management for broadcast and narrowcast media environments. Myers' ProTrack - available in TV and Radio versions - is a modular software suite that integrates with existing workflows and third-party systems, such as automation, archive, accounting, PSIP, web and content databases to ensure optimal efficiency.

N

narda
Safety Test Solutions
an L3 Communications Company

Narda Safety Test Solutions
Hauppauge, NY
Tel: 631-231-1700
Web: www.narda-sts.us

Narda-STS offers sensors for FCC RF Radiation compliance. Our SRM-3006 system displays individual signal strengths of stations, even at a shared location. We also provide broadband meters and monitors to help you comply with FCC Rules. Fixed or Mobile, inside or out - Narda has the solution for Broadcaster's.

NEC Display Solutions
Itasca, IL
Tel: 866-NEC-MORE
Web: www.necdisplay.com

NetApp
Sunnyvale, CA
Tel: 604-801-5300
Web: www.netapp.com

Netia
Claret, France, France
Tel: +33 4 67 59 97 47
Web: www.netia.com

Neutrik USA
Lakewood, NJ
Tel: 732-901-9488
Web: www.neutrik.com

Nevion
Oxnard, CA
Tel: 805-247-8560
Web: www.nevion.com

Newtec
Sint-Niklaas, Belgium, Belgium
Tel: +32 (0)3 780 65 00
Web: http://www.newtec.eu/

Nickless Schirmer & Co
Florence, KY
Tel: 800-543-1584
Web: www.nsccom.com

Noise Industries
Boston, MA
Web: www.noiseindustries.com

North Star Technical Services
Hollywood, FL
Tel: 800-842-1671
Web: www.nstpower.com

NVerzion
Salt Lake City, UT
Tel: 801-293-8420
Web: www.nverzion.com

O

OConnor
Burbank, CA
Tel: 818-847-8666
Web: www.ocon.com

Omneon
San Jose, CA
Tel: 800-788-1330
Web: www.omneon.com

Optima EPS
Lawrenceville, GA
Tel: 770-496-4000
Web: www.optimaeps.com

Orad
Jersey City, NJ
Tel: 201-332-3900
Web: www.orad.tv

COMPANY DIRECTORY

P

Pebble Beach Systems
Weybridge, Surrey, United Kingdom
Tel: +44 1932 333790
Web: www.pebble.tv

Pebble Beach Systems is a world leader in automation and media management with products for multichannel playout, news and sports and interactive television. Installed in over 40 countries and with proven systems ranging from single to 96 channels in operation, Pebble Beach provides end-to-end file based workflows that are scaleable, flexible and reliable.

PESA
Huntsville, AL
Tel: 256-726-9200
Web: www.qustream.com

Petrol
Valley College, NY
Tel: 845-268-0100
Web: www.petrolbags.com

Pharos Communications Ltd
Reading, Berkshire, United Kingdom
Tel: +44-118-9502323
Web: www.pharos-comms.com

Pilat Media
Wembley, London, United Kingdom
Tel: +44 (0) 20 8782 0700
Web: http://www.pilatmedia.com

Pixel Power
Burbank, CA
Tel: 818-276-4515
Web: www.pixelpower.com

Pixelmetrix NA
Ft Lauderdale, FL
Tel: 866-749-3587
Web: www.pixelmetrix.com

PlayBox Technology Ltd
Brookmans Park Teleport, Great North Rd
Hatfield, Herts
AL9 6NE United Kingdom
Tel: +44 1707 664444
Contact: Don Ash

Prism Media Products Inc
Rockaway, NJ
Tel: 973-983-9577
Web: www.prismsound.com

Proavio USA
Santa Fe Springs, CA
Tel: 562-324-6500
Web: www.proavio.com

ProConsultant Informatique
Metz, France
Tel: 33 3 87 37 78 78
Web: www.proconsultant.net

Propagation Systems Inc - PSI
Ebensburg, PA
Tel: 814-472-5540
Web: www.psibroadcast.com

Q

Quantel
Vienna, VA
Tel: 203-972-3199
Web: www.quantel.com

Quintech Electronics
Indiana, PA
Tel: 800-839-3658
Web: www.quintechelectronics.com

R

Radiall USA Inc
Chandler, AR
Tel: 480-682-9400
Web: www.radiall.com

RADIAN
A DIVISION OF
PRESTIGE TELECOM

Radian - A divison of Prestige Telecom
Oakville, ON, Canada
Tel: 905-339-4059
Web: www.prestigebroadcast.com

Radio Frequency Systems GmbH
Hannover, Germany
Web: www.rfsworld.com

Riedel Communications Inc
Glendale, CA
Tel: 818-241-4696
Web: www.riedel.net

Rohde & Schwarz
Columbia, MD
Tel: 888-TES-TRSA
Web: www.rohde-schwarz.com

Roscor
Mt Prospect, IL
Tel: 800-843-3679
Web: www.roscor.com

Ross Video Ltd
Iroquois, ON, Canada
Tel: 613-652-4886
Web: www.rossvideo.com

RTS: Bosch Security Systems, Inc., Communications Systems Division
Burnsville, MN
Tel: 800-392-3497
Web: www.rtsintercoms.com

RTW GmbH & Co Kg
K÷ln, NRW, Germany
Tel: +49221709130
Web: www.rtw.de

Russ Burger Design Group
Addison, TX
Tel: 972-661-5222
Web: www.rbdg.com

S

Sabre Towers & Poles
Canyon Lake, TX
Tel: 800-369-6690
Web: www.sabretowersandpoles.com

Sachtler
Valley College, NY
Tel: 845-268-0100
Web: www.sachtler.us

Salzbrenner Stagetec Mediagroup Inc USA
Atlanta, GA
Tel: 888-782-4391
Web: www.stagetec.com

SAN Solutions
Reno, NV
Tel: 1 866-661-7144
Web: www.sansolutions.com

ScheduALL
Hollywood, FL
Tel: 800-334-5083
Web: www.scheduall.com

Schneider Optics
Van Nuys, CA
Tel: 818-766-3715
Web: www.schneideroptics.com

Screen Service Broadcasting Services
Via G Di Vittorio 17
25125 Brescia
Italy
Tel: +39 30 3582225
Fax: +39 030 3582226
E-mail: sales@screen.it
Web: www.screen.it
Contact: Gianluca Baccalini, Mr

Sencore
Sioux Falls, SD
Tel: 605-978-4600
Web: sencore.com

Sennheiser Electronic
Old Lyme, CT
Tel: 877-736-6434
Web: www.sennheiserusa.com

SENSIO Technologies
Montreal, QC, Canada
Tel: 514 846 2022
Web: www.sensio.tv

SGT
Champs sur Marne, France
Tel: +33 1 64 73 74 74
Web: www.sgt.eu

Shotoku Broadcast Systems
Torrance, CA
Tel: 866-SHOTOKU
Web: www.shotoku.tv

Signiant
Burlington, MA
Tel: 781-221-4000
Web: http://www.signiant.com/

Singular Software
Vancouver, BC, Canada
Web: www.singularsoftware.com

Snell
3519 Pacific Ave
Burbank, CA 91505
Tel: 818-556-2616
Fax: 818-556-2626
E-mail: info@snellgroup.com
Web: www.snellgroup.com
Contact: John Shike, VP Marketing & Channel Management - Americas

Softel
Reading, Berks, United Kingdom
Tel: +44 118 9842151
Web: www.softel.co.uk

Software Generation Ltd (SGL)
Cincinnati, OH
Tel: 615-324-3613
Web: www.sglbroadcast.com

Solid State Logic
Begbroke, Oxford, Oxon, United Kingdom
Tel: +44 1865 842300
Web: www.solid-state-logic.com

Solid State Logic (SSL)
Los Angeles, CA
Tel: 323-549-9090
Web: www.solidstatelogic.com

Sonnet Technologies Inc
Irvine, CA
Tel: 949-587-3500
Web: www.sonnettech.com

Sony Creative Software Inc
Madison, WI
Web: www.sonycreativesoftware.com

Staco Energy Products Company
Dayton, OH
Tel: 866-261-1191
Web: www.stacoenergy.com

Storeel
Atlanta, GA
Tel: 770-458-3280
Web: www.storeel.com

Streambox
Streambox Inc
Seattle, WA
Tel: 206-956-0544
Web: www.streambox.com

Switchcraft Inc
Chicago, IL
Tel: 773-792-2700
Web: www.switchcraft.com

T

TZ Sawyer Technical Consultants
Falls Church, VA
Tel: 301-461-2069
Web: www.tzsawyer.com

TANDBERG Television, Part of the Ericsson Group
Duluth, GA
Tel: 678-812-6209
Web: www.tandbergtv.com

COMPANY DIRECTORY

TBC Consoles
Edgewood, NY
Tel: 888-CON-SOLE
Web: www.tbcconsoles.com
TBC designs and manufactures technical furniture systems. Our primary focus is broadcast and video production but also includes security, network operations, transportation, power utilities, and sports facilities. From individual workstations to complete control rooms, TBC combines the latest thinking in ergonomics and adaptability with the highest levels of aesthetics and workmanship.

Teamcast
Cedex, France
Tel: +33 2 23 252680
Web: www.teamcast.com

Tektronix Inc
Beaverton, OR
Tel: 800-835-9433
Web: www.tektronix.com

Telecast Fiber
Worcester, MA
Tel: 508-754-4858
Web: www.telecast-fiber.com

Telemetrics
Mahwah, NJ
Tel: 201-848-9818

Telestream
Nevada City, CA
Tel: 530-470-1300
Web: www.telestream.net

Telex Communications
Burnsville, MN
Tel: 800-392-3497
Web: www.telex.com

thinklogical
Milford, CT
Tel: 800-291-3211
Web: www.thinklogical.com

Triveni Digital
Princeton Junction, NJ
Tel: 609-716-3500
Web: www.trivenidigital.com

TV One
Erlanger, KY
Tel: 800-721-4044
Web: www.tvone.com

TV Logic USA
Burbank, CA
Tel: 818-567-4900
Web: www.TvLogicUSA.com

U

Utah Scientific
Salt Lake City, UT
Tel: 800-453-8782
Web: www.utahscientific.com

V

Vector 3
Barcelona, -, Spain
Tel: +34 934 151 285
Web: www.vector3.tv

Versatile Power
Campbell, CA
Tel: 408-341-4600
Web: www.versatilepower.com

Video Design Software
Melville, NY
Tel: 631-249-4399
Web: www.videodesignsoftware.com

Videoframe Inc
Nevada City, CA
Tel: 530-477-2000
Web: www.videoframesystems.com

Video Technics Inc
Atlanta, GA
Tel: 404-327-8300
Web: www.videotechnics.com

VideoTechSupply.com
Harrisburg, PA
Web: www.videotechsupply.com

Videssence
El Monte, CA
Tel: 626-579-0943
Web: www.videssence.tv

ViewCast
Next Generation Streaming Media Solutions

ViewCast
3701 W Plano Pkwy, Ste 300
Plano, TX 75075
Tel: 972-488-7200
Toll Free: 800-540-4119
Fax: 972-488-7299
E-mail: jeffl@viewcast.com
Web: www.viewcast.com
Contact: Jeff LaGrone, Sales Operations Manager
ViewCast develops industry-leading hardware and software for the transformation, management and delivery of professional quality video over IP and mobile networks. ViewCast's award-winning solutions simplify the complex workflows required for the Web-based streaming of news, sports, music and other video content to computers and mobile devices, empowering broadcasters, businesses and governments to easily and effectively reach and expand their audiences. With more than 350,000 video capture cards deployed globally, ViewCast sets the standard in the streaming media industry. ViewCast Niagara® streaming appliances, Osprey® video capture cards, and Niagara SCX® encoding and management software provide the highly reliable technology required to deliver the multi-platform experiences driving today's digital media market.

Vinten Radamec
Valley College, NY
Tel: 845-268-0100
Web: www.vintenradamec.com

VISLINK
News & Entertainment

Vislink
Chesham, Bucks, United Kingdom
Tel: + 44 1494 774400
Web: www.vislink.co.uk

Vislink News and Entertainment sells Vislink's three established broadcast product brands including satellite uplink manufacturer Advent Communications, wireless camera manufacturer Link Research and Microwave Radio Communications, which manufactures fixed and mobile microwave links. Vislink is synonymous with innovation in live television markets. We are the worldwide leader in microwave, satellite and wireless communication systems for the capture of live TV coverage of news and sports events, with an installed base of over 100,000 systems in over 90 countries.

Vislink News & Entertainment (MRC)
N Billerica, MA
Tel: 800-490-5200
Web: www.vislinknews.com

Vizrt
New York, NY
Tel: 212-560-0708
Web: www.vizrt.com

Volicon
Burlington, MA
Tel: 781.221.7400.x140
Web: http://www.volicon.com/

VSN Video Stream Networks
Terrassa, Barcelona, Spain
Tel: +34 937349970
Web: www.vsn-tv.com

W

Ward-Beck Systems Ltd
455 Milner Ave, Unit 10
Toronto, ON
M1B 2K4 Canada
Tel: 416-335-5999 x 35
Toll Free: 800-771-2556
Fax: 416-335-5202
E-mail: kevinlyver@ward-beck.com
Web: www.ward-beck.com
Contact: Kevin Lyver, Senior Office Manager

Wheatstone Corp
New Bern, NC
Tel: 252-638-7000
Web: www.wheatstone.com

Whirlwind
Rochester, NY
Tel: 800-733-9473
Web: www.whirlwindusa.com

WideOrbit
San Francisco, CA
Tel: +1 828 252 8891
Web: www.wideorbit.com

WireCAD
Nampa, ID
Tel: 866-273-5298
Web: www.wirecad.com

Wireworks Corporation
Hillside, NJ
Tel: 800-642-9473
Web: www.wireworks.com

Wohler Technologies Inc
Hayward, CA
Tel: 888-5-WOHLER
Web: www.wohler.com

Wowza Media Systems
Evergreen, CO
Tel: 888-778-7997
Web: www.wowzamedia.com

WTI, Inc.
Ventura, CA
Tel: 866-gotowti
Web: www.gotowti.com

X

Xytech Systems Corp
Burbank, CA
Tel: 818-303-7800
Web: www.xytechsystems.com

Z

Zeus Broadcast
Orlando, FL
Tel: 407-352-6501
Web: www.zeusbroadcast.com

A PENTON MEDIA PUBLICATION

BroadcastEngineering®

www.broadcastengineering.com

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

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

Penton

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

MEMBER ORGANIZATIONS
Sustaining Member of:
- Society of Broadcast Engineers

Member, American Business Media; Member, BPA International, The Missouri Association of Publications

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

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

ARCHIVES AND MICROFORM: This magazine is available for research and retrieval of selected archived articles from leading electronic databases and online search services, including Factiva, LexisNexis and Proquest. For microform availability, contact National Archive Publishing Company at 800-521-0600 or 734-761-4700, or search the Serials in Microform listings at napubco.com.

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

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

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

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

Copyright 2010, Penton Media, Inc. All rights reserved

AD INDEX

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

SALES OFFICES

US/CANADA

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

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

INTERNATIONAL

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

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

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

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

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

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

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

Broadcast Engineering, December 2010, Vol. 52, No. 12 (ISSN 0007-1994) is published monthly and mailed free to qualified persons by Penton Media, Inc. 9800 Metcalf Ave., Overland Park, KS 66212-2216. Periodicals postage paid at Shawnee Mission, KS, and additional mailing offices. Canadian Post Publications Mail Agreement No. 40612608. Canada return address: Bleuchip International, P.O. Box 25542, London, ON N6C 6B2. POSTMASTER: Send address changes to Broadcast Engineering, P.O. Box 2100, Skokie, IL 60076-7800 USA. CORRESPONDENCE: Editorial and Advertising: 9800 Metcalf, Overland Park, KS 66212-2216 Phone: 913-341-1300; Edit. fax: 913-967-1905. Advert. fax: 913-967-1904. © 2010 by Penton Media, Inc. All rights reserved.

BroadcastEngineering®

SPECIALIZED TRAINING

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

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

Broadcast Engineering has assembled key and knowledgeable instructors to prepare a catalog of video, broadcast, satellite, engineering and operational courses for station and production staff. These courses are designed to provide tutorial, non-product, training on the basics and intricacies of video, audio, and basic electronics.

Best of all—courses are self-paced and accessible from any computer at any time! Students can start and stop the courses at their leisure. All that's required is a standard internet connection and computer audio.

Our catalog has something for everyone. Some courses are designed for newly-hired and less-trained employees. Other courses provide an engineer-level tutorial. There will be courses appropriate for any level of training you may need! Enjoy courses such as IT for Engineers, Satcom, Intro to Video Compression and many more.

BENEFITS OF A CORPORATE SUBSCRIPTION:

- Provides low cost training. No travel, housing or overtime pay required.
- Ensures a standard basic level of training for all employees.
- Provides a refresher course to current staff.
- Helps employees keep pace with the times and technology.
- Use the courses to prepare key staff for promotions to new duties.
- Material is industry targeted and thus useful in preparing for SBE certification (though not designed for any specific SBE certification test).
- Authors are broadcast engineers, consultants and industry-specific experts with more than 100 years of combined experience.
- New courses are continually being developed. Let us know if there are specific course topics you'd like us to develop and cover!

For a complete catalog of current courses, or more information on purchasing your corporate subscription, please contact: Steven Bell at 913-967-7221 or steven.bell@penton.com.

Powered by

Zeus™ BROADCAST

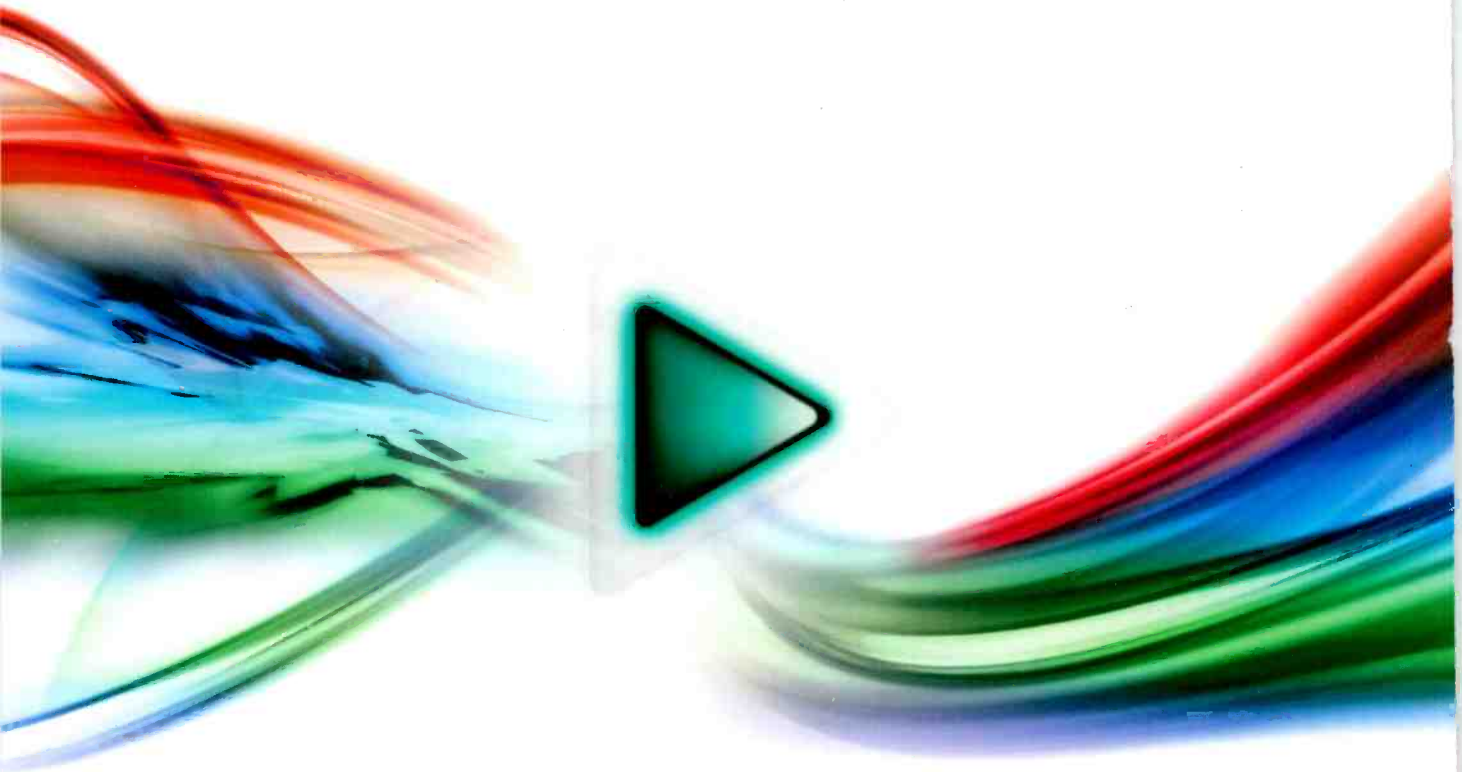
An Otor Digital Company

TRAINING DOESN'T COST, IT PAYS!

PLAYBOX TECHNOLOGY

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

It's all in a PlayBox



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

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

• **PlayBox UK** +44 1707 66 44 44 • **PlayBox Bulgaria** +359 2 9703050 • **PlayBox Romania** +4 031106 5115 • **PlayBox Turkey** +90 216 3379402
• **PlayBox Germany** +49 22411691717 • **PlayBox Adria** +381 113117286 • **PlayBox Albania** +355 44 80 45 52 • **PlayBox USA** +1 404 424 9283
• **PlayBox Asia Pacific** +6012 2880760 • **PlayBox India** +91 9811913333 • **PlayBox Latin America Sales** +598 99 192929