A supplement to *Broadcast Engineering* - December 2005

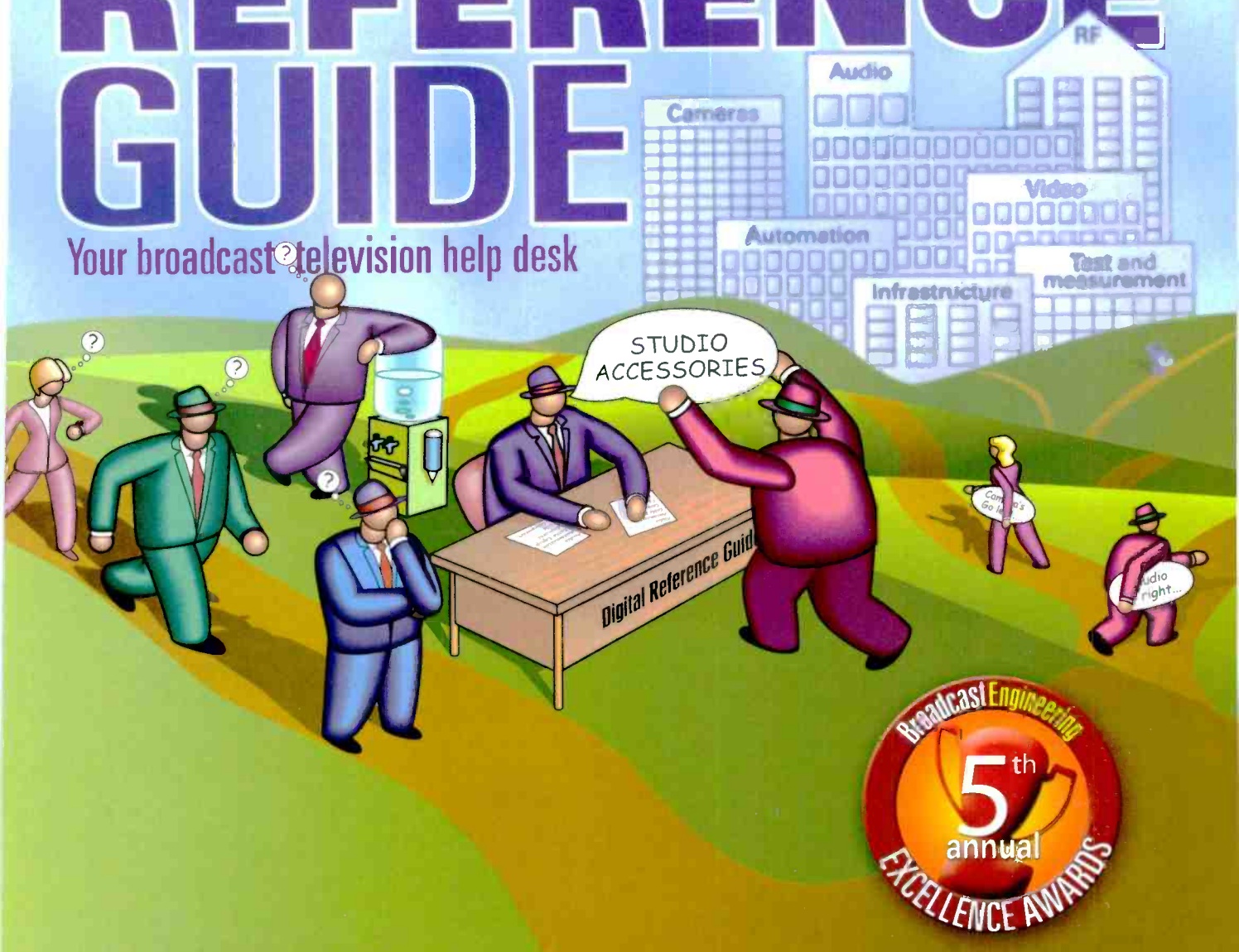
Broadcast Engineering®

THE JOURNAL OF DIGITAL TELEVISION

2006

DIGITAL REFERENCE GUIDE

Your broadcast television help desk



THIS IS NOT AN AUDIO CONSOLE

Audio Control

D-9

IT'S A DIGITAL CONTROL SURFACE

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

Production

OTHER SURFACES can share common audio resources

Studio 2

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

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

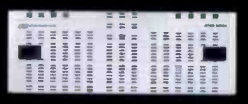
A traditional intuitive surface layout gets your operators up and running FAST—even in full 5.1 surround mode.

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

CENTRAL FRAME can control a 1024 x 1024 mixing based router

Engineering

Engineering



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

Wheatstone

sales@wheatstone.com / tel 252-638-7000 / www.wheatstone.com

ULTIMATE HD

ULTIMATE 1030HD
PATENTED

ULTIMATE 1030HD FLUID HEAD
FOR CAMERAS UP TO 35 LBS.
+90° –90° TILT RANGE

ULTIMATE 2060HD
PATENTED

ULTIMATE 2060HD FLUID HEAD
FOR CAMERAS UP TO 60 LBS.
+90° –90° TILT RANGE

ULTIMATE 1030HDs
PATENTED

ULTIMATE 1030HDs FLUID HEAD
FOR CAMERAS UP TO 45 LBS.
+60° –60° TILT RANGE

The Ultimate Fluid Heads for HD

These three new fluid heads from OConnor are designed to give you the ultimate control and stability for your HD shooting. The 1030HD and 2060HD heads have the same features and controls as our 2575 fluid head, the standard for 35mm film cameras. Both heads feature OConnor's patented sinusoidal counterbalance system for true, accurate balance at any point in the full +90° –90° tilt range. The 1030 HDs offers greater weight capacity with a +60° –60° tilt range. Add to this OConnor's stepless, ultra-smooth pan & tilt fluid drag specifically enhanced for HD applications, and you've got the best of all possible combinations. If you're shooting HD, you've got to try these heads.

You really can feel the difference.

OConnor's Ultimate 1030HD with a 25 lb. camera on Sachtler's Speed Lock® CF *Tripod*

oconnor
A Division of Sachtler ®

100 Kalmus Drive Costa Mesa, CA 92626 Tel (714) 979-3993 Fax (714) 957-8138 http://www.ocon.com sales@ocon.com

Table of Contents

Your broadcast television help desk

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* Web site. You can electronically search for vendors by name or product category in seconds. Go to *www.broadcastengineering.com*, and give it a try.

And the winner is ...

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 a record-breaking 42 entrants — all wanting to be picked as the top facility in their category!

Read, vote and win a *Broadcast Engineering* T-shirt!

After reading the entries, go to the *Broadcast Engineering* Web site and click on the *Excellence Awards* button. You will be taken to the voting page. Select one entry from each category as your favorite. Provide your e-mail address to be entered in a drawing for T-shirts. Your e-mail address will only be used for that purpose.

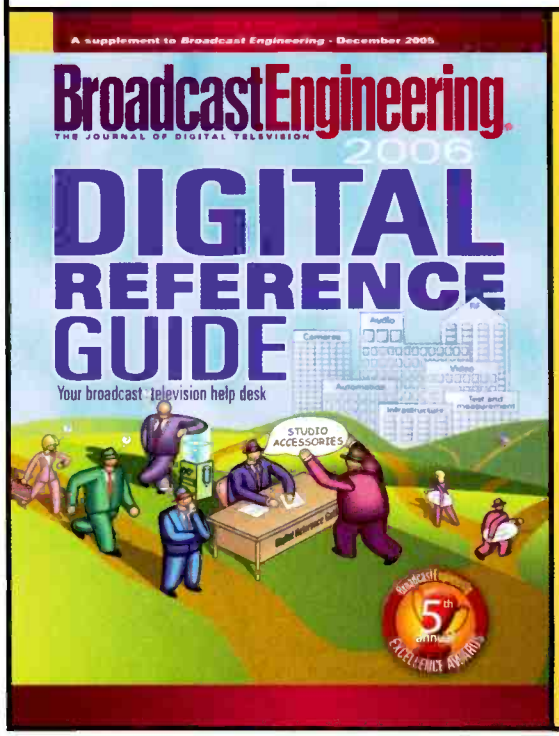
Complete your voting before Feb. 1, 2006. The winners of the Excellence Awards will be announced in the March pre-NAB issue.

Brad Dick
Editorial Director

READ VOTE WIN

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

See page 75 for this year's entries, and look for the March NAB issue to find out who the winners are!



MARCY GILBERT ▶ BLOWN AWAY BY MAXELL

Marcy Gilbert, President & CEO of IDC (International Digital/Duplication Centre Inc.), is the ultimate Maxell Professional. IDC is America's premiere post production facility, utilizing a variety of Maxell professional products, including Digital Betacam, Betacam SP, Betacam SX, DVCPRO, HDCAM, D2 and D3. "I depend on Maxell to help achieve maximum video and audio quality with the highest levels of reliability and integrity." You can reach Marcy at Marcy@idcdigital.com. To learn more about Maxell Professional Media, call 1.800.533.2836 or visit www.maxellpromedia.com.

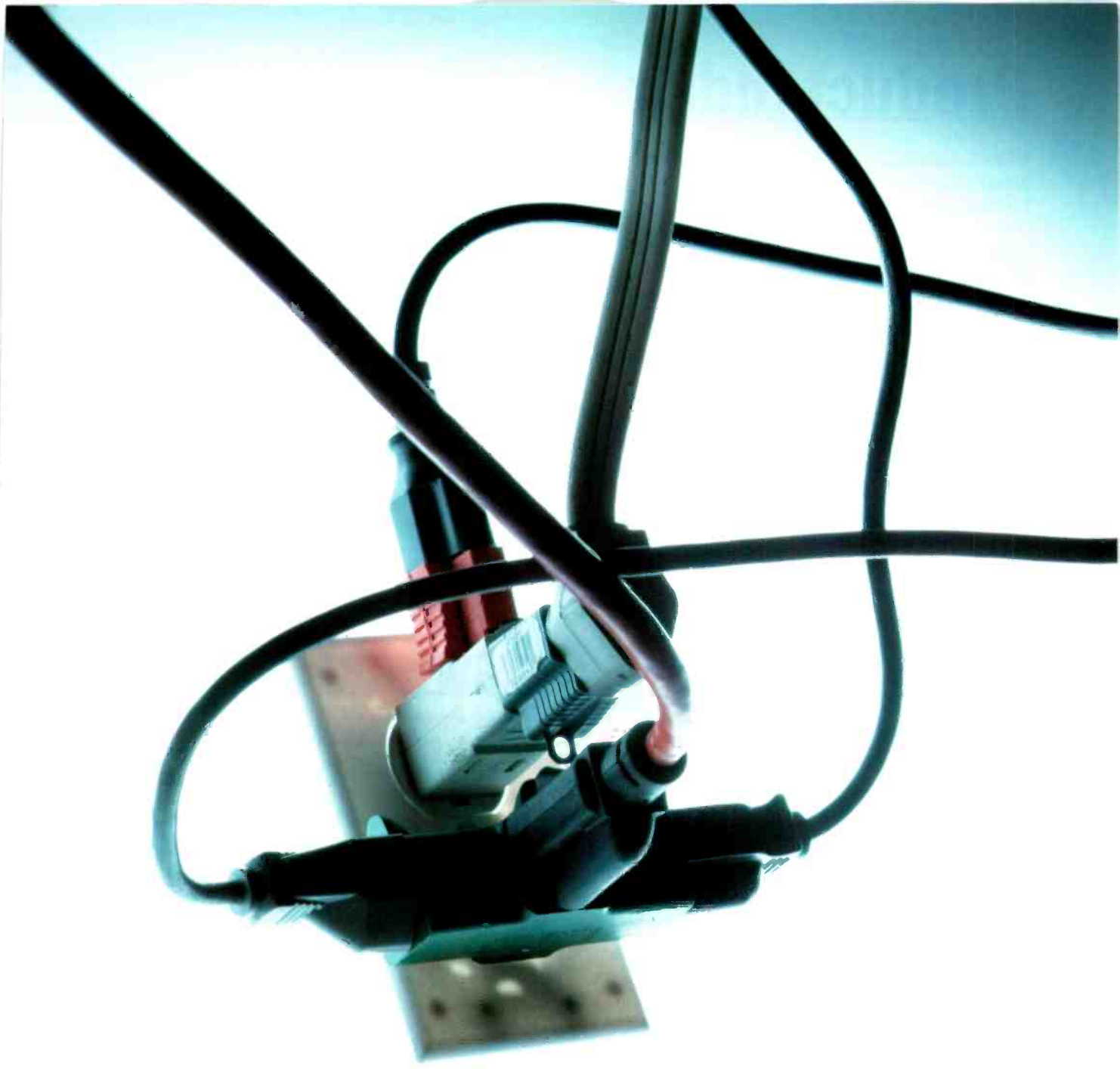
To download a PDF version of our new DVD Authoring and Duplication booklet, visit **www.maxellpromedia.com.**

maxell

Expanding Memory & Mobility ▶

Recordable Media Data Storage Portable Energy Technological Partnerships

Product index



Why take a chance on "good enough"?

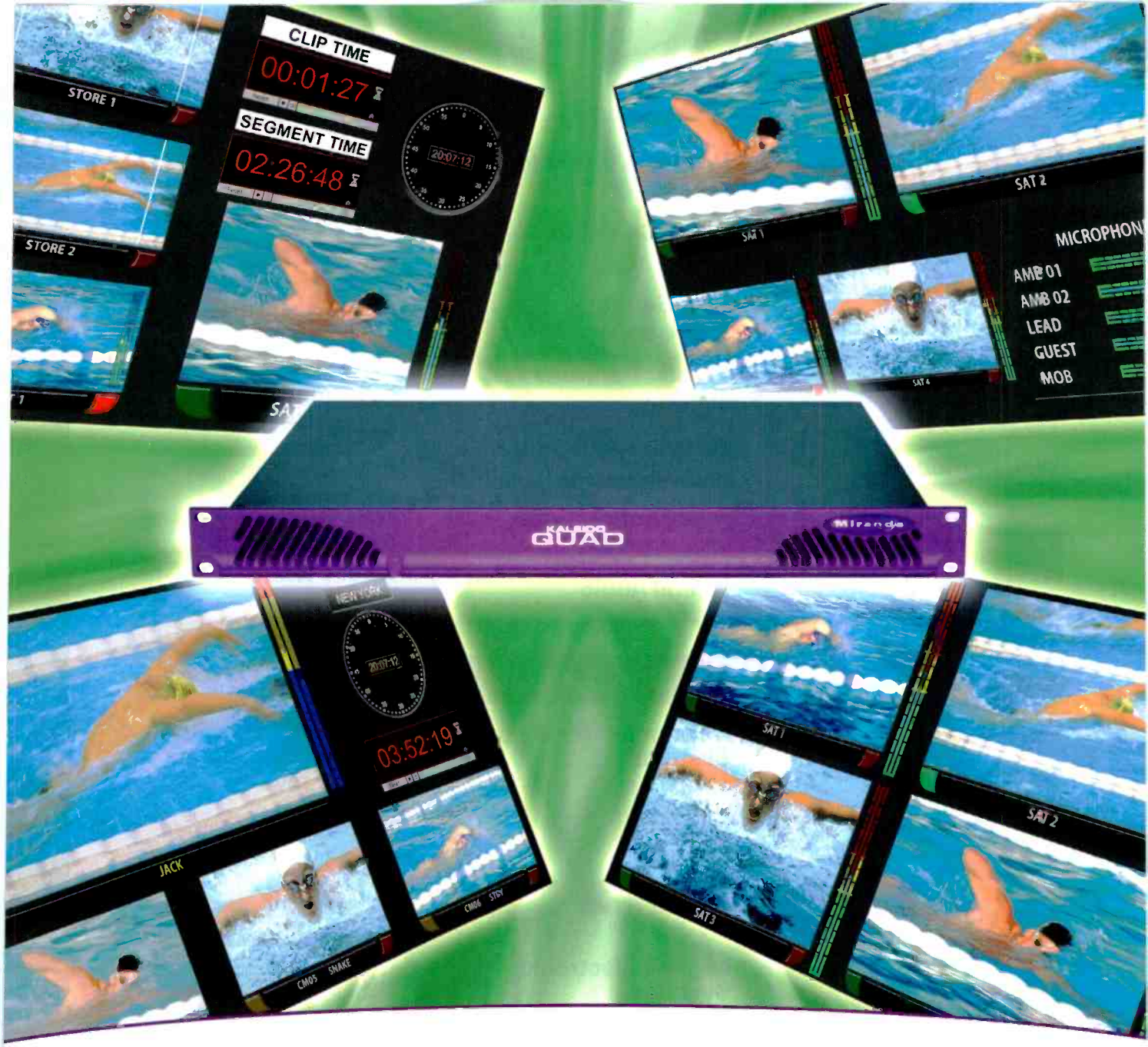
With new lower prices on Avid media networks, there's no need to cobble together a solution that's just "good enough". Now, proven power and performance are within easy reach of any broadcaster. Edit, share, and transfer broadcast-quality media instantly. Collaborate in real time. From ingest to playout, a workflow built around an **Avid Unity™ LANshare** system is more than a complete solution. It's a competitive advantage.

Call 800-949-AVID for more information

Visit www.avid.com/lanshareforнews to download the free whitepaper,
Avid Unity LANshare: The power to succeed

Avid
do more™

Product index



Display four HD signals, any way you like

With the affordable **Kaleido-Quad-HD**, you get all the features you'd only expect to see in more expensive multi-image display processors. Like variable image sizes and positions plus clocks, UMDs, and audio metering. There's also versatile, auto-sensing HD/SD/Analog video inputs plus rapid mouse control. And all this is combined with class leading, pristine image quality. But if you need something bigger, step up to the 10-input **Kaleido-Alto-HD** which offers an equally rich feature set. Or for the most advanced monitoring applications, there's the highly adaptable 32-input **Kaleido-K2**. So for more flexible monitoring, contact Miranda.

Miranda

Tel.: 514.333.1772 | ussales@miranda.com

www.miranda.com

HDTV: MAKING IT HAPPEN

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Weircliffe
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WhisperRoom
423-585-5827

Audio accessories

Ac-cetera
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BAG END Loudspeaker Systems
847-382-4550

Bittree
818-500-8142

COMTEK
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D.W. Electrochemicals
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Edcor Electronics
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ESE
310-322-2136

JT Communications
352-236-0744

Martinsound
626-281-3555

NKK Switches
480-991-0942

Pipo Communications
323-466-5444

Riedel Communications
908-647-9072

Research Technology (RTI)
847-677-3000

SmartSound Software
818-920-9122

TerraSonde
303-545-5848

Wohler Technologies
510-870-0810; 888-596-4537

Audio codecs

Dolby Laboratories
415-645-5000

Neural Audio
425-814-3200

Audio meters

Benchmark Media Systems
315-437-6300

ESE
310-322-2136

Evertz
905-335-3700

Logitek Electronic Systems
713-664-4470

Martinsound
626-281-3555

Sencore
605-339-0100; 800-736-2673

Shepherd Systems
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Television Systems (TSL)
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TerraSonde
303-545-5848

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Zandar Technologies
321-939-0457

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ERG-Ventures
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Link Electronics
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Rane
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TSL
+44 0 1628 687 200

Ward-Beck Systems
416-335-5999

Wohler Technologies
510-870-0810; 888-596-4537

Audio patch panels

ADC
952-938-8080; 800-366-3889

Audio Accessories
603-446-3335

Bittree
818-500-8142

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GEPCO INTERNATIONAL, INC.
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PatchAmp
201-457-1504

Signal Transport
949-859-9615

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CALREC BROADCAST SYSTEMS

ZETA

SYSTEM PLUS

THE EVOLUTION OF BROADCAST AUDIO PRODUCTION

The System Plus platform represents a new milestone in facilities which are now available across the Alpha, Sigma and Zeta range.

Zeta System Plus offers broadcasters a wealth of upgraded specifications including a fully adaptable and flexible colour TFT metering system that enables user defined metering schemes for individual programmes. Also new is the provision for SNMP reporting to an external network for sophisticated status reporting.

- Up to 48 channel/group faders
- Up to 108 equivalent mono channels
- Automatic redundancy on PSUs, DSP and control processors
- All cards and panels are hot-swappable
- Comprehensive colour TFT metering with full configurability
- 8 stereo or mono audio groups
- 8 auxes, 15 multitrack outputs
- 2 main stereo or 5.1 surround outputs
- Simultaneous LCRS, stereo and mono outputs available from each 5.1 main output
- Console operates independently of PC
- Console and racks boot from power on in less than 20 seconds
- Full control system reset in less than 15 seconds with no loss of audio

COMPATIBLE WITH HYDRA NETWORKING

CALREC

Find out why the world's biggest broadcasters trust Calrec with their most crucial creative decisions at www.calrec.com

South and Mid West States: Tel: (615) 871 0094 Email: ericj@redwoodweb.com
North East States and Canada: Tel: (212) 586 7376 Email: dsimon@studioconsultants.com
Western States: Tel: (818) 841 3000 Email: jschaller@audiospec.com

Contact: Calrec Audio Ltd, Nutclough Mill, Hebden Bridge, West Yorkshire, HX7 8EZ, UK
Tel: 01144 1422 842159 Email: enquiries@calrec.com Web: www.calrec.com

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TV Pro Gear
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Whirlwind
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Headphones

Audio-Technica
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Clear-Com
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Riedel Communications
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Eighteen Sound
390 522 941596

Wohler Technologies
510-870-0810; 888-596-4537

Surround Sound accessories

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Modulation Sciences
732-302-3090

Neural Audio
425-814-3200

Shepherd Systems
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Solid State Logic
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TASCAM
323-726-0303

Wohler Technologies
510-870-0810; 888-596-4537

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Soundcraft
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Zaxcom
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Studio mixers

Audio Technologies (ATI)
215-443-0330; 856-719-9900

Behringer
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Calrec Audio
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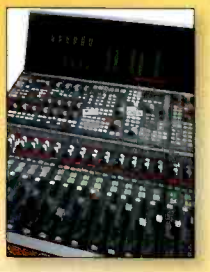

Zeta is a digital console with true broadcast features for local TV markets, local network stations, radio production centres and Outside Broadcast vehicles. Retaining the unique and essential broadcast features of Calrec's Alpha and Sigma consoles, Zeta 100 is fully equipped as standard with a host of broadcast specific features.

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Harrison by GLW
615-641-7200

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Lawo
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Salzbrenner Stagetec Mediagroup
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818-920-3212

Studer
818-920-3212

TV Pro Gear
818-788-4700

Wheatstone
252-638-7000

AUDIO PROCESSING

Audio compressor expanders

Behringer
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Neural Audio
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Prime Image
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Rane
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Solid State Logic
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TV Pro Gear
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Audio effects systems

Solid State Logic
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Soundfield
702-365-5155

AUDIO RECORDING

Audio playback devices

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TASCAM
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Audio recorders/ players (ATR, MD, etc.)

Burlington A/V Recording Media & Equipment
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EDIROL
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Enco Systems
248-827-4440

Euphonix
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Studer
818-920-3212

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TASCAM
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360 Systems
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Audio A/D-D/A converters

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315-437-6300

Blackmagic Design
702-257-2371

Digigram
703-875-3100

Ensemble Designs
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Hotronic
408-378-3883

Knight's Communications
817-821-8614

Link Electronics
573-334-4433

Network Electronics
801-495-1635

NVISION
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Pixel Instruments
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Pro-Bel
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Ross Video
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Symetrix Audio
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Ward-Beck Systems
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Wohler Technologies
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Audio compression

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Audio DAs

Audio Technologies (ATI)
856-719-9900

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Ensemble Designs
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NVISION
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Utah Scientific
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Wheatstone
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Wohler Technologies
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Product directory

AUTOMATION SYSTEMS

Sundance Digital

SUNDANCE DIGITAL

Award winning Sundance Digital offers reliable broadcast automation for individual stations, centralcasting, and high channel-count facilities. Industry leading systems, scalable Titan™ and FastBreak™ Automation, are backed by a responsive development team ad world-class 24/7 support. Beyond master control, Sundance enables workflow with NewsLink™ integration for the newsroom and Seeker™ asset management.

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Record/Playback broadcast quality video with ORIGINAL SMPTE timecode, closed captions and VBI data. Retrieve video clips quickly by searching Closed Caption text phrases and metadata fields. Create PDL/RDL/XDL and use as Video Server. Controllable by all popular automation systems or RS422. Replaces any failing tape deck flawlessly.

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Communications Engineering
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+852 2730 2117

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Harris
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MicroFirst
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MSD Digital Media Group
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Nextamp SA
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OmniBus Systems
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Wegener
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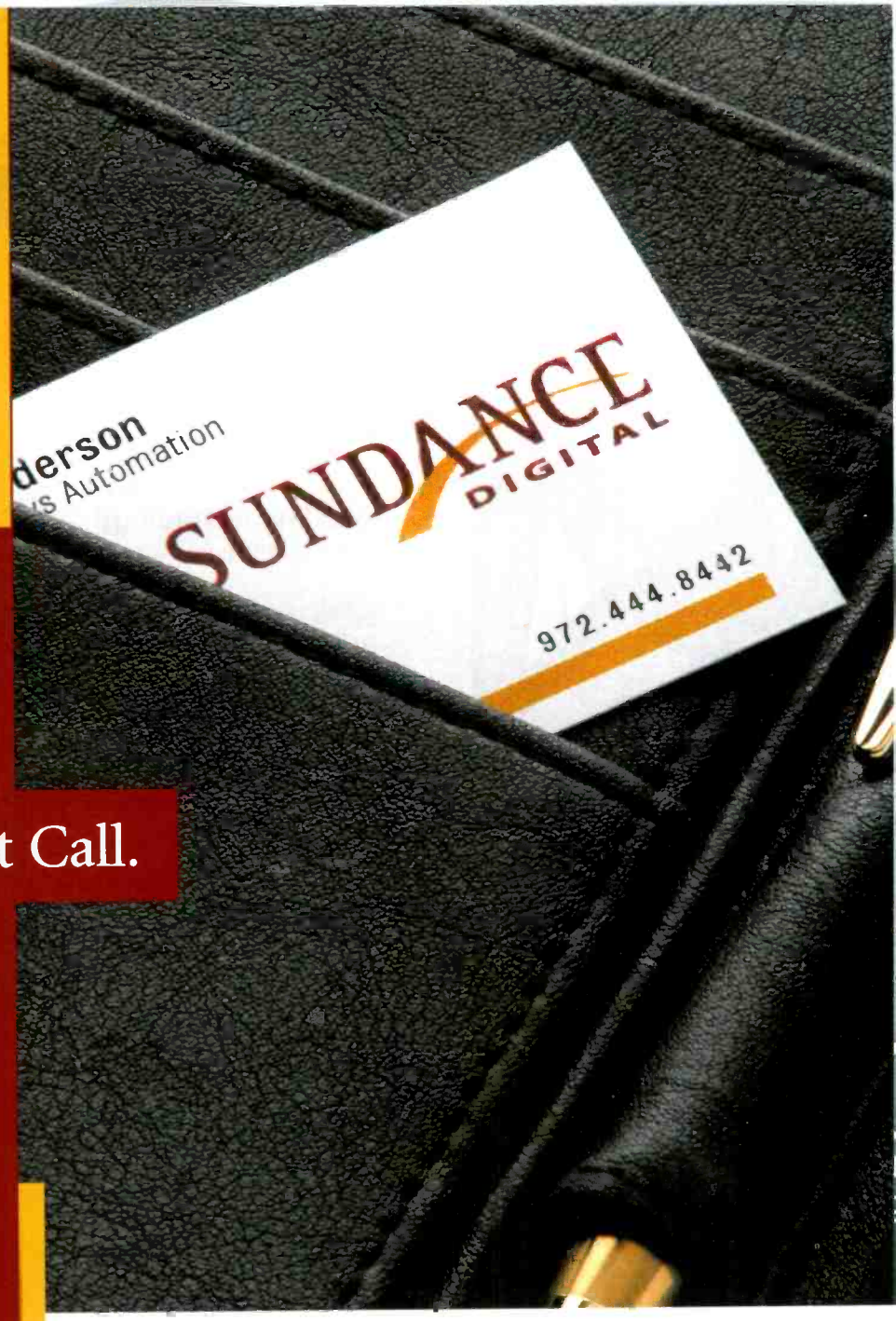

Smart Call.

With Sundance Digital automation software, good broadcasting also means improved business results — more efficiency, greater accuracy, increased productivity and higher profitability. Now, how smart is that?

The secret lies in managing digital workflow. By integrating digital television and information technologies, our automation software handles the core operations of your broadcast business. This Digital Workflow Management helps you perform the same complex tasks you're already doing. Only with greater speed, more control and unprecedented flexibility.

That not only improves your on-air product, but also your bottom line. Just the kind of thinking that makes Sundance Digital the smartest call in the business.

SUNDANCE DIGITAL

BROADCAST AUTOMATION SOLUTIONS

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Product directory

Utah Scientific
801-575-8801

PSIP and DTV encoders

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Thales Broadcast & Multimedia
413-998-1100; 800-288-8364

TV business automation (traffic systems)

Crispin
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Harris
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Nextamp
+33 299 6162

ScheduALL
954-334-5406

WideOrbit
415-675-6751

TV facility automation

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Associated Press
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AVEC
412-429-2000

Blueline Technology
972-353-2583

Crispin
919-845-7744

Digital Transaction Group
512-837-3737

Florical Systems
352-372-8326

Harris
513-459-3400

Hi Tech Systems
+44 125 6780880

IBIS
877-541-4247

JT Communications
352-236-0744

Leightronix

LEIGHTRONIX, INC.
CONTROL PRODUCTS

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MATCO
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MicroFirst
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National TeleConsultants
818-265-4400

OmniBus Systems
704-319-2231

Pebble Beach Systems
+441737821522

Pro-Bel
631-549-5159

Managing everything from simple server playout to complex channels where schedules are changing regularly. Pro-Bel's Morpheus automation provides a scaleable, cost-effective solution using 'best of breed' technologies and a design that supports fault resilience at every level. At the core of Morpheus is the MediaBall(tm) concept, allowing even the most complex sequences of events to be packaged in a way that provides simple presentation to an operator and easy manipulation within a schedule.

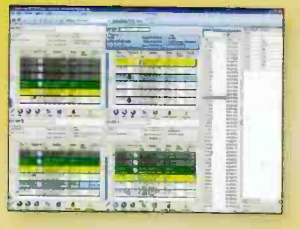
Professional Communications Systems
813-888-5353; 800-447-4714

Sandeann Industries
512-863-2421

SGT
+33 1 64 73 74 74

Software Generation (SGL)
+44 238 0233322

Sundance Digital
972-444-8442



Sundance Digital's FastBreak NXT series blends the latest in Windows enhancements and navigation techniques into a highly customizable, automation-centric framework. NXT's design efficiencies include a high-performance user interface, and the thin-client List Processors developed for Titan, Sundance's larger scale product. NXT offers a cost-effective package for individual stations managing one to several channels.

Indicates advertisers

Telestream
530-470-1300

Video Design Software
631-249-4399

Videomedia
208-762-4162

WideOrbit
415-675-6751

TV news automation systems

Associated Press
202-736-1100

Autocue Systems
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Avid Technology
978-640-5678; 800-230-2843

Broadcast Software Solutions
770-978-9450

Cinegy
202-742-2736

Compprompter News and Automation
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Crispin
919-845-7744

Dalet Digital Media Systems
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Dayang
+852 2730 2117

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Konan Digital
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Media Computing
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MicroFirst
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MSD Digital Media Group
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OmniBus Systems
704-319-2231

Pebble Beach Systems
+441737821522

Pinnacle Systems
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Product directory

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Ross Video
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ScheduALL
954-334-5406

SGT
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Spencer Technologies
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Sundance Digital
972-444-8442

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Broadcast cable equipment

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Broadata Communications
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C-COR
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Controlware Communications Systems
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Grass Valley
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Hitachi
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IPITEK
760-438-1010

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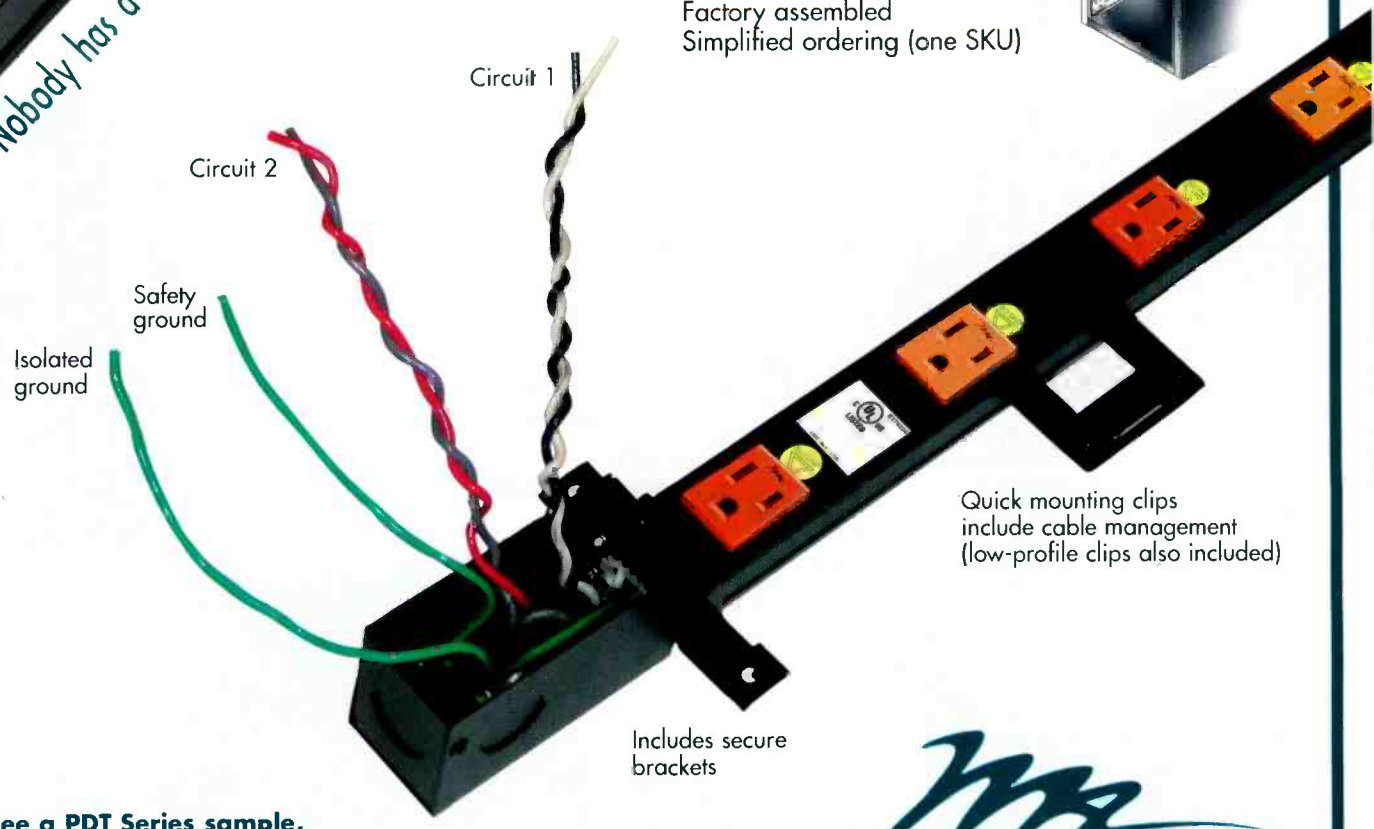

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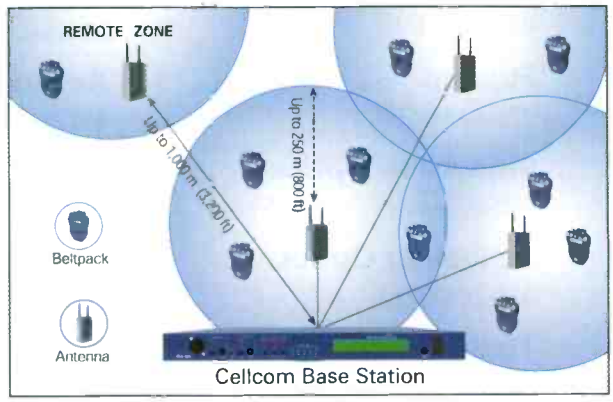

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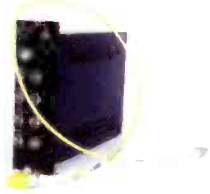

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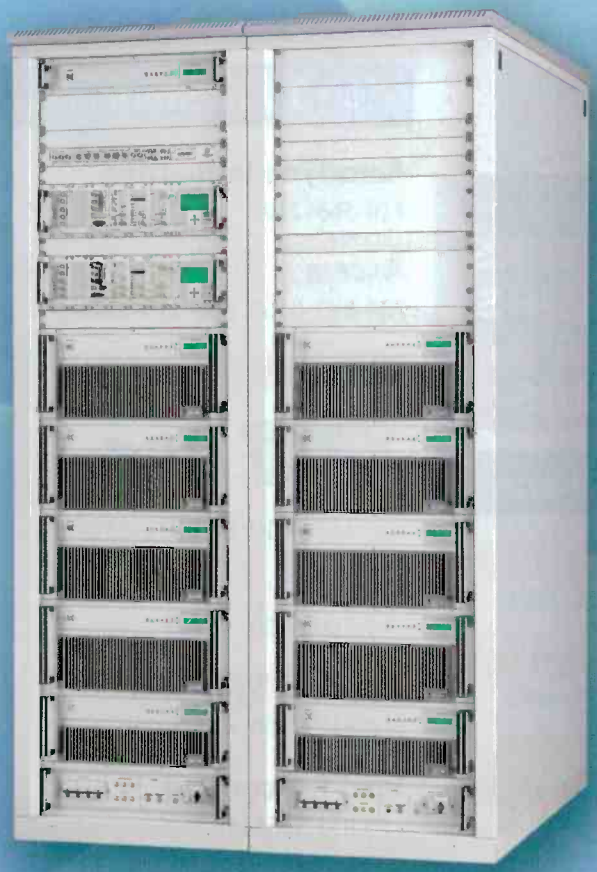

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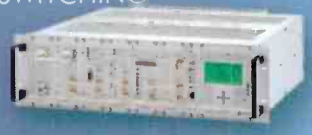

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e-mail: info@screen.it - www.screen.it

Product directory

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905-335-3700

Hamlet
949-597-1053; 866-442-6538

K-Will
949-553-9701; 949-553-9701

Panasonic Broadcast & Television Systems
201-348-5300

Pro-Bel
631-549-5159

Sencore
605-339-0100; 800-736-2673

TV Pro Gear
818-788-4700

Wohler Technologies
510-870-0810; 888-596-4537

Waveform monitors/ vectorscopes

Advanced Test Equipment Rentals
858-558-6500

Astro Systems
818-848-7722

Data Check
858-373-5492

DK-Technologies

DK-Technologies

831-335-5299

Electronic Visuals
+01483771663

Hamlet
949-597-1053; 866-442-6538

Leader Instruments
714-527-9300; 800-645-5104

Magni Systems
503-615-1900

Sencore
605-339-0100; 800-736-2673

Serious Magic
916-985-8000

SyntheSys Research
650-364-1853

Tektronix
503-627-7111; 800-835-9433

Videotek
610-327-2292

TV TRANSMITTERS, TRANSLATORS, EXCITERS & ANTENNAS

MMDS products

Axcera
724-873-8100; 800-215-2614

Electronics Research
812-925-6000; 877-374-5463

Screen Service Broadcasting Technologies
+39 030 3582225

Sencore
605-339-0100; 800-736-2673

Stratex Networks
408-943-0777

Thales Broadcast & Multimedia
413-998-1100; 800-288-8364

Remote control systems (transmitter)

Rohde & Schwarz
410-910-7800; 888-837-8772

Statmon Technologies
310-288-4580

Teko Telecom
+39 051 6256148

Thales Broadcast & Multimedia
413-998-1100; 800-288-8364

TV exciters

Acrodyne Industries
410-568-2105

Axcera
724-873-8100; 800-215-2614

DMT USA

DMT USA

856-423-0010; 888-912-8326

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- Digital TV measurement demodulator
- Battery-powered field portability

It supports analog and digital broadcast and digital cable standards used throughout the world.

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Axcera
724-873-8100; 800-215-2614

DMT USA
856-423-0010; 888-912-8326

Harris
513-459-3400

L-3 Communications Electron Devices
570-326-3561

LARCAN USA
303-665-8000

Opticomm
858-450-0143; 800-867-8426

Richardson Electronics
630-208-2200

Rohde & Schwarz
410-910-7800; 888-837-8772

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T-Systems Media & Broadcast
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Teko Telecom
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Thales Broadcast & Multimedia
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TV transmitting antennas

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DMT USA
856-423-0010; 888-912-8326

Electronics Research
812-925-6000; 877-374-5463

Jampro Antennas/ RF Systems
916-383-1177

Kathrein Scala Div
541-779-6500

Micro Communications
603-624-4351

Propagation Systems Inc (PSI)
814-472-5540

Stainless LLC
215-631-1313

T.Z. Sawyer Technical Consultants
301-921-0115

Teracom Components/ Acorn RF
207-627-7474

Tower Network Services
239-481-3688

VEHICLES

ENG trucks

Allen Osborne Associates
805-495-8420

Frontline Communications
727-573-0400

Gerling and Associates
740-965-2888

N Systems
410-964-8400

Professional Communications Systems
813-888-5353; 800-447-4714

Shook Mobile Technology
210-651-5700

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Product directory

Satellite flyaway systems

Advent Communications
+44 1494 774400

Gerling and Associates
740-965-2888

Link Research
+44 192 3200900

Scopus Network Technologies
609-987-8090

Shook Mobile Technology
210-651-5700

Satellite uplink trucks

Advent Communications
+44 1494 774400

Frontline Communications
727-573-0400

Gerling and Associates
740-965-2888

Shook Mobile Technology
210-651-5700

T-Systems Media & Broadcast
+49 761 880 62320

VIDEO ACCESSORIES

EAS products VBI data software systems

Broadcast Software Solutions
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Computer Prompting & Captioning (CPC)
301-738-8487

Digital Alert Systems
520-896-0303

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905-335-3700

Norpak
613-592-4164

Vela
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GPS equipment

Masterclock
636-724-3666

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Time code equipment

Adrienne Electronics
702-896-1858

ESE
310-322-2136

Evertz
905-335-3700

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949-489-0240

Masterclock
636-724-3666

Video accessories

ADC
952-938-8080; 800-366-3889

Bella
818-563-9500

D.W. Electrochemicals
905-508-7500

Da-Lite Screen
574-267-8101

DSC Laboratories
905-673-3211

Electrophysics
973-882-0211

ESE
310-322-2136

NKK Switches
480-991-0942

Professional Communications Systems
813-888-5353; 800-447-4714

ProSource/BMI
203-335-2000

Videoframe
530-477-2000

Wohler Technologies
510-870-0810; 888-596-4537

Video captioning equipment

AVS Graphics & Media
801-975-9799

Broadcast Video Systems (BVS)
905-305-0565

Computer Prompting & Captioning - CPC
301-738-8487

EEG Enterprises
516-293-7472

Enco Systems
248-827-4440

Norpak
613-592-4164

Sencore
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Video patch panels

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847-795-9555

PatchAmp
201-457-1504

Switchcraft
773-792-2700

VIDEO COMPRESSION EQUIPMENT

Compression encoders/decoders

Adtec Digital
615-256-6619

Cinegy
202-742-2736

Digital Vision
818-769-8111; +46 733 552602

Doremi Labs
818-562-1101

DVEO (Computer Modules)
858-613-1818

Enseo
972-234-2513

Harris
513-459-3400

JVC Professional Products
800-582-5825

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MATCO
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Modulus Video
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Product directory

Optibase
650-230-2567

Radyne ComStream
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Scopus Network Technologies
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Sencore
605-339-0100; 800-736-2673

Snell & Wilcox
818-556-2616

Stradis
404-320-0110

Streambox
206-956-0544

TANDBERG Television
407-380-7055

Thales Broadcast & Multimedia
413-998-1100; 800-288-8364

Vela
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Compression pre-processors

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Scopus Network Technologies
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Snell & Wilcox
818-556-2616

Statistical multiplexers

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Scopus Network Technologies
609-987-8090

TANDBERG Television
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Terayon Communication Systems
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413-998-1100; 800-288-8364

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Broadcast Microwave Services
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905-946-9666

DVC Digitalvideo Computing GmbH
+49 815 293010

Evertz
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408-353-2670

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Optibase
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Prime Image
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Radio IP Software
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Radyne ComStream
602-437-9620

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Streambox
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Vela
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Video noise reduction systems

Digital Vision
818-769-8111; +46 733 552602

Radyne ComStream
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Snell & Wilcox
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Xintekvideo
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Editing systems and components

Accom
650-328-3818

Apple
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Avid Technology
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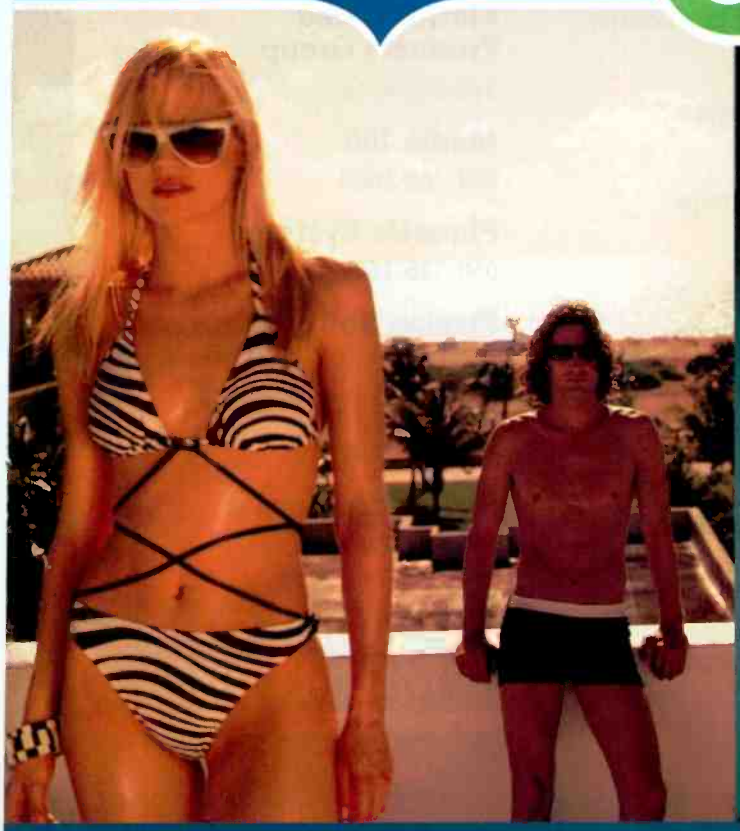

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Digital Voodoo
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Incite
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MTI Film
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Pinnacle Systems
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Pixelan Software
360-647-0112

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703-448-3199

Skyline Broadcast
866-804-1184

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818-920-9122

Sony Electronics
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818-840-1351

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eCinema Systems
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408-954-4500

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818-846-3600

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530-477-4300

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212-269-1902

Barco Visual Solutions
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Christie
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Product directory

Electrosonic
952-931-7500

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Marshall Electronics
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Product directory

Zandar Technologies US Sales
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Video presentation equipment

ANALOG WAY
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WolfVision
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Zandar Technologies US Sales
321-939-0457

Video walls

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Christie
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Evertz
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Professional Communications Systems
813-888-5353; 800-447-4714

TBC Consoles
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Winsted
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Zandar Technologies US Sales
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VIDEO ROUTING AND DISTRIBUTION

Control signal routers/ patch panels

Audio Accessories
603-446-3335

Blackmagic Design
702-257-2371

Multidyne Video & Fiber Optic Systems
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Network Electronics
801-495-1635

NVISION
530-265-1000

Prime Image
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Videoframe
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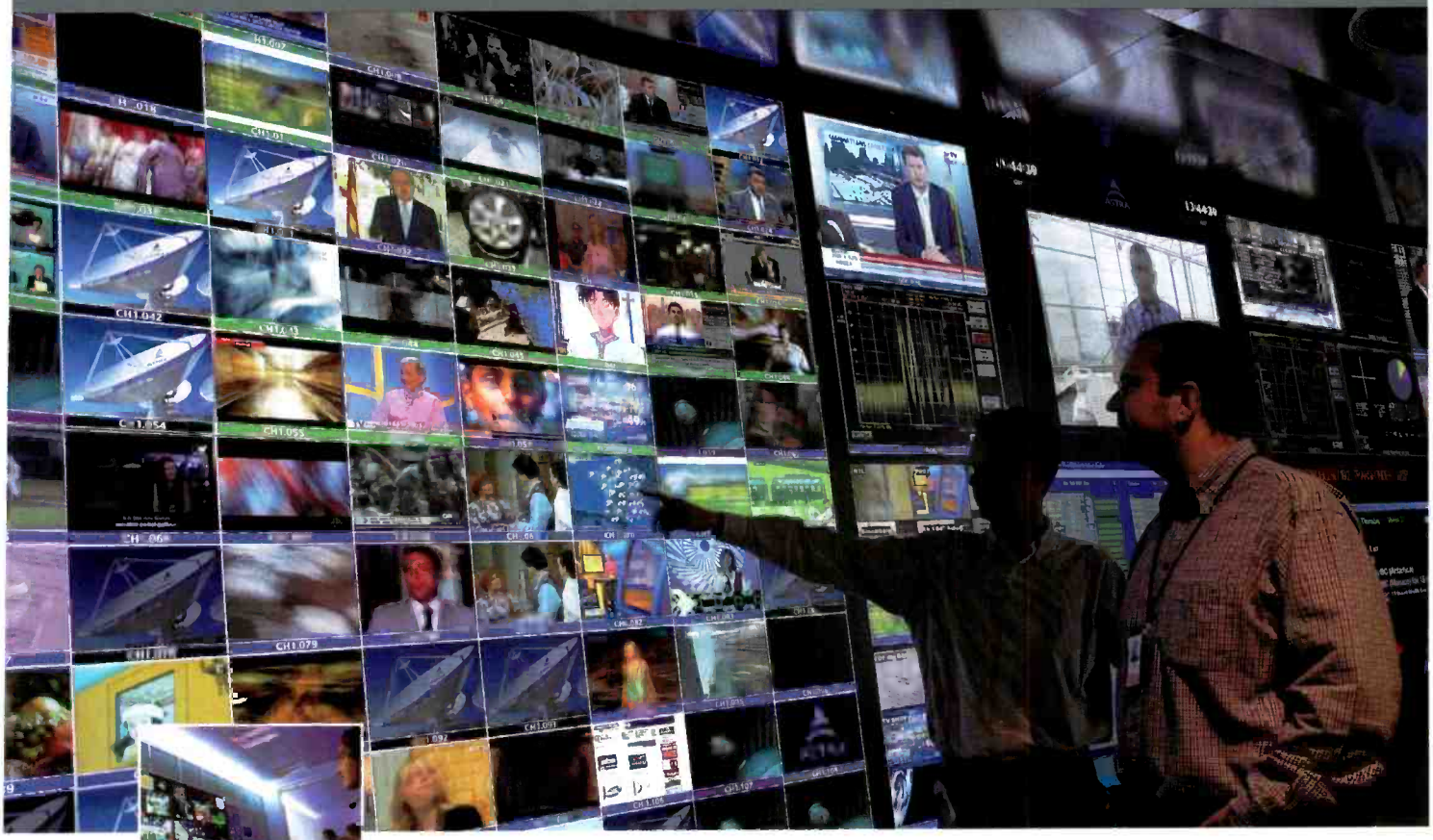

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Horita
949-489-0240

Knox Video Technologies
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Kramer Electronics
908-735-0018; 888-275-6311

Marshall Electronics
310-333-0606; 800-800-6608

Multidyne Video & Fiber Optic Systems
516-671-7278

Network Electronics
801-495-1635

NVISION
530-265-1000

PatchAmp
201-457-1504

Ross Video
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Sierra Video Systems
888-275-6311; 908-735-0018

Snell & Wilcox
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Studio Systems Electronics
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Network Electronics
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Snell & Wilcox
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AutoPatch
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BUF Technology
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Burst Electronics
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Clear Blue Audio Video
303-412-9477

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ISIS Group
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Kramer Electronics
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Network Electronics
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TV Pro Gear
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Masstech Group
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Medea
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Nesbit Systems
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Software Generation Ltd (SGL)
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C-COR
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Drastic Technologies
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Enseo
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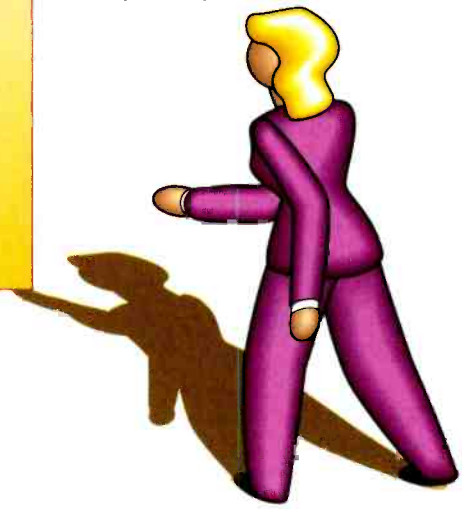

Florical Systems
352-372-8326

MATCO
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Sundance Digital
972-444-8442

Video Technics
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On-air presentation systems

Arcatron
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Media 3
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Video Technics
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Still/clip stores

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DIVAworks@fpdigital.com

front porch digital
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BREECE HILL

Product directory

Tape library systems

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Nesbit Systems
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Sandeann Industries
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VDRs (video disk recorders)

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Leightronix
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Medea
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BUF Technology
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C-COR
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919-883-4193

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Doremi Labs
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416-255-5636

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Enseo
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The NEXUS is the ideal television automation solution for local broadcast, cable, and private in-house operations. The NEXUS provides multichannel digital video playback and recording, digital messaging/signage, DVD/VCR machine control, and video/audio signal routing. The NEXUS operates as a stand-alone device and is managed via network using provided WinNEXUS software.

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MATCO
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Omneon Video Networks
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Pinnacle Systems
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Quantel
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Sencore
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VTRs (video tape recorders)

Media Concepts
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Panasonic Broadcast & Television Systems
201-348-5300

Studio Exchange
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Videomagnetics
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WIRE, CABLE & CONNECTORS

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ADC
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Belden CDT Electronics Div
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Clark Wire & Cable

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Components Express
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Gepco

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Whirlwind
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Pomona Electronics
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Switchcraft
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Whirlwind
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Fiber-optic cabling

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Axon Digital Design
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Belden CDT Electronics Div
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Burle Industries
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Canare
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Knight's Communications
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Modular frame systems

ADC
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Axon Digital Design
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Signal Transport
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818-556-2616

Videoframe
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Video cable

ADC
952-938-8080; 800-366-3889

Anixter
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Belden Cable
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Belden CDT Electronics Div
765-983-5200

Canare
818-365-2446

Clark Wire & Cable

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847-949-9944

Components Express
630-257-0605

Gepco

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Nemal Electronics
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The winning facilities will be announced in the March 2006 issue of *Broadcast Engineering* and will receive their plaques at the 2006 NAB convention.

Brad Dick

Brad Dick
Editorial Director

This year's entries are:

Category: *New studio technology — station*
Submitted by: *Ascent Media Systems & Technology Services*

KNTV and Telemundo share resources

KNTV and Telemundo are two completely individual stations that share resources to transmit simultaneously from the same building. Both owned and operated by NBC, the stations relocated from smaller quarters to occupy a 100,000sq ft shared space in San Jose, CA. A corporate mandate to consolidate resulted in a single facility that houses all offices, technical facilities and mirror image studios, offering sweeping vistas of airy newsrooms.

Ascent Media served as the system integrator for the turnkey move and digital upgrade, including the satellite facilities that took approximately one year from design to launch. The firm worked with the NBC team and Gensler, an architectural firm, to design an infrastructure based upon SDI signal distribution, with two-channel non-embedded AES audio.

A central equipment room contains 140 racks of core gear, including routing switchers, the NBC hub racks, distribution equipment, MATV, networking equipment, patching, audio equipment, intercom, clock, and reference and studio gear. One Grass Valley Trinix switcher accomplishes routing for both stations.

Two separate, but nearly identical, production control rooms have a fully loaded 64-input Sony MVS-8000 production switcher system, Calrec audio consoles and Pinnacle EFX Dekos. KNTV's monitor wall consists of 120 CRT monitors. Approximately 70 monitors are used for Telemundo's channels. The Sony MVS-8000 production switchers drive Image Video UMDs monitor wall tallies.

A third control room, used mainly for linear editing by both stations, is equipped with a limited complement of legacy equipment, including an upgraded Sony SDI production switcher, to serve as a backup in the event either of the other control rooms suffers a catastrophic failure.

A common technical operations center (TOC) is located between the two control rooms. Satellite dishes are steered, and incoming and remote feeds are monitored and processed in the area. The TOC also acts as the video control center with a hub router control panel, format conversion capability and dubbing for the entire plant. Flexible shading for the six BVP-900 Sony studio cameras, two flash cams and two overhead Eagle Cam ENG cameras also is handled in the TOC. Robotic control workstations are situated in the center to control the Vinten robotic pedestals on the studios' floors and at remote locations, such as the NBC hub in San Francisco, via remote telemetry.

Twelve Grass Valley NewsEdit nonlinear edit suites, capable of being used by either station for news and sports are attached to a Grass Valley Profile redundant (media area network) system for shared ingest, storage and play-to-air. ■

Design team

NBC
- Paul Russell, technical consultant

Ascent Media
- Mark Sackett, proj. mgr., lead eng.
- Steve Vitale, proj. mgr.
- Graham Benteley, sr. video eng.
- Jerry Stalder, sr. video eng.
- Tim Caldecott, sr. video eng.
- Eddie Ly, sr. video eng.
- Chris Crummett, sr. video eng.
- Andy Knieriem, install. sup., lead technician

Technology at work

Avid
- Pro Tools audio editing and sound design tools
- Symphony SD mastering tool
- Adrenaline DNA hardware

Calrec audio consoles
Grass Valley Trinix router
Sony
- MVS-8000 production switchers
- 7350A production switchers
- BVP-900 studio cameras

Pinnacle EFX Dekos
Vinten robotic pedestals

Broadcast Engineering 5th annual EXCELLENCE AWARDS

Category: *New studio technology — station*
Submitted by: *Omneon Video Systems/NVerzion/Beck Associates*

TV8 and TV17
relocate to a digital facility

TV8 and TV17, located in Vail, CO, serve as the primary information source to Vail and Eagle Valley. TV8 decided to build all-new digital facilities for the stations, and Beck Associates was brought in to plan and implement this relocation.

TV8 had outgrown both its facility and tape-based workflow, so it began studying the many solutions available. It selected an Omneon Spectrum media server system and NVerzion automation, for its open, advanced architectures. Its user-friendly interfaces also fit well with the young staff at TV8.

The design criteria incorporated two essential components: a two-channel, automated, server-based master control system and a production control system capable of producing a high-quality local news program. Serial digital video and AES audio were established as base signal requirements.

The high cost per square foot of real estate in Vail necessitated a combination master control room, central equipment room and production control room — all packed into less than 350sq ft.

The server provides ingest, production and playout that offers format independence and tight integration with Apple Final Cut Pro. Two editors are connected to the system via Gigabit Ethernet for edit-in-place operation. Another key factor of the server was the ability to add or replace channels without bringing the system down or affecting other live channels.

The automation provided the final control system wrapper, including full control for acquisition and preparation of MPEG-2/DV-25 program content and the final on-air control for both channels. This cost-effective system was designed based on the station's initial system requirements, while ensuring the opportunity for growth to meet future needs.

The team chose Grass Valley's digital routing and terminal equipment, including 64x64 digital video and 64x64 AES routers, to provice the core infrastructure, and Leitch LogoMotion II systems for channel branding. The production system was designed around a Grass Valley Kayak DD-2 production switcher, a 2M/E switcher that provides a large-market look at a cost-effective price. For graphics, the team chose a Pinnacle Deko 1000.

A matrix-style intercom was required for heavy IFB requirements. Telex/RTS provided a small but powerful intercom system, the Zeus 24-channel matrix.

TV8's existing cameras were converted to serial digital with component A/D updates. A Mackie 24x8 production mixer also was relocated and fitted with external A/D and D/A converters. Playback elements include both server channels and VTRs. The facility uses Sony DVCAM VTRs for both studio and acquisition. Two nonlinear edit bays allow for production of local program content and commercials. ■

Design team

Beck Associates
- John FitzRandolph, VP, Denver
- Skip Erickson, systems eng.

TV-8
- Craig Struve, dir. TV op.
- Mike Wilson, chief eng.

Technology at work

- Beck Associates custom consoles
- Evertz 5600 MSC master sync generator
- Grass Valley
  - Concerto/Encore digital router
  - 8900 Series terminal equipment
  - Kayak DD-2 production switcher
- Leitch
  - LogoMotion II channel branding
  - Panacea 16x2 MC switching
- Omneon Spectrum media server
- NVerzion NControl automation
- Pinnacle Deko 1000 CG
- Sony DSR-2000 DVCAM VTRs
- Telex/RTS Zeus intercom system
- Videotek VTM-200 T&M
- Wohler audio monitors

Category: *New studio technology — station*
Submitted by: *Professional Communications Systems (PCS)*

WMFE-TV

finds a bonus channel after adversity

The original plan for WMFE's new facility in Orlando called for broadcasting four SD channels during the day, one HD and one SD at night, along with a feed for cable — in addition to the NISC hannel. Construction design called for a large and complex project. And, despite some surprising challenges, the result became more than what was envisioned.

The new multichannel digital station was to be located within what had been a two-story storage area in its existing building. Construction of the master control center was delayed when it was learned that the existing walls did not have the expected — and necessary — concrete reinforcing to support a new second floor.

To create the broadcast systems design and do the installation, WMFE contracted with Professional Communications Systems (PCS). A significant factor in the appointment was PCS' ability to see upgrade challenges from the perspectives of both the station operator and the systems integrator. As a division of Media General, PCS has direct involvement in the day-to-day operations of dozens of TV stations.

PCS first prepared a scope of work plan, which was used to solicit bids from competing integrators. Throughout that process, the systems integrator listened to what the station wanted, went away and thought about it, and then brought the station a response that matched its needs.

Thanks to technology developments during a number of delays and the efforts of the design team, WMFE is able to transmit an HD and *two* SD channels at night — one more than the single, planned SD channel. With the analog channel and cable, the new facility now operates six independent channels by day.

The resulting digital system is fully automated and, if desired, could broadcast from the file storage server for five days without intervention. Other digital storage contains months of reusable programming. PCS also automated the analog station for the facility by augmenting the legacy equipment and systems.

During postponements in the two-year project, PCS stored the equipment it had procured for the station and held off the installation until construction was completed and the station was ready to proceed. Starting later than planned called for a lot of flexibility.

In the sometimes perplexing move to digital operations, it's not unusual for daunting challenges to occur in an ambitious construction and installation project. For WMFE, the in-process application of new and emerging technology, and a cooperative relationship, overcame adversity. The result is the relatively rare bonus of an additional nighttime SD channel for the Orlando market. ■

Design team

WMFE
- Mike Simmons, dir. of eng.
- Phil Kuhn, eng. mgr.
- Aldo Vivona, VP of admin., tech.

Professional Communications Systems (PCS)
- Dan Whitman, design eng.
- Larry Stephen, sales eng.
- Butch Hinson, sales eng.
- Glenn Thomason, dir. of eng.
- Troy Pazos, installation mgr.
- Bill Elush, VP sales

Technology at work

- Masstech MassStore management
- NVISION NV5128-MC multichannel HD/SD routing
- Ross Video Gear Lite modular video and audio processing system
- Snell & Wilcox IQ Series modular glue system
- Sony CSM100L PetaSite scalable tape library and broadcast monitors
- Sundance Digital Titan automation
- TANDBERG Television E5780 and E5710 HD/SD encoding system
- Tektronix WFM-700 series HD/SD video and audio T&M
- Videotek
  - DDM demodulators
  - VTM series HD/SD monitoring
- Wohler AMP1 and LM series audio and video monitoring

Broadcast Engineering 5th annual Excellence Awards

Category: *New studio technology — station*
Submitted by: *Communications Engineering, Inc. (CEI)*

WMHT-TV

moves its six productions without interruption

Located in New York, WMHT operates three TV stations, plus two radio stations and a radio reading service for the visually impaired and print disabled.

To meet the challenges of the new digital age, the station purchased a 42,000sq ft office building and added 10,500sq ft of studio space for its new production and broadcast center.

The facility hired systems integrator Communications Engineering, (CEI) to provide a turnkey design and integration solution. A major requirement was to move the station's production and on-air operations 22mi with no disruptions.

CEI engineers coordinated every aspect of the buildout and transition including: new satellite downlink antennas, tower construction for television and radio STLs, a multichannel master control room, two television studios, a production control room, a 5.1 audio control room, three nonlinear edit systems with shared storage, an FM on-air studio, an FM production studio, audio editing, three audio live and record control rooms, tape and DVD duplication systems, and media-capable conference rooms.

A primary goal for all new systems was efficient operations with digital file-based content flow between editing, studio productions and on-air operations. The systems were designed with a digital infrastructure to accommodate the facility's current and future production needs. All new equipment chosen was HD-compatible or has a clear upgrade path. New viewing monitors were either LCD or DLP. CRT-based monitors were only purchased for critical quality control monitoring.

The production control room can easily accommodate a wide range of live and live-to-server programs. It has four Clarity Bobcat 40in LCD monitors that are driven by Miranda Kaleido Alta multi-image display processors, allowing the display of 40 simultaneous input sources. The control room is capable of recording directly to Omneon video servers with networked file transfer direct to the on-air playback systems.

Audio control is capable of content creation and monitoring of Dolby 5.1 audio and has shared content storage with all systems.

The multichannel master control is capable of monitoring all sources and air return signals via two Clarity Margay 50in DLP displays. Miranda's Kaleido-K2 processors allow configurable monitoring of HD and SD signals. The master control room is interfaced to the first operational PBS ACE system. ■

Design team

WMHT
- David Nicosia, mgr. eng. op.
- Derk van Rijsewijk, chief op.
- Anthony Tassarotti, IT sys. admin.

CEI
- Brinton Miller, proj. mgr.
- Paul Sherriffs, design eng.
- Rob Goldheim, design eng.
- Don Brassell, system config. and support

Amundsen Electronics
- David Amundsen

Allen Tower
- Patrick Allen

Technology at work

Apple
- Final Cut Pro HD
- XSAN storage

Euphonix Max Air digital audio mixing system

Grass Valley
- Trinix routers
- Apex Routers

Logitek Console router system

MassTech MassStore archive and asset management system

Omneon media servers

Ross Synergy 3 production switcher

Sony BVM D Series monitors

WXXI

transitions, updates and expands

WXXI public broadcasting is a community-owned television and radio production and broadcast facility serving the Rochester, NY, region with quality local and national programming. The 30-year-old facility was originally built to provide service for one TV station and one radio station.

It was time to transition to digital, update and expand. The redesigned facility needed the ability to produce multiple TV and radio streams for six TV channels and six radio channels in a digital environment.

The design needed to include a plan that maintained the operation of existing channels to minimize off-air time. The blueprint for the renovation was divided into four manageable phases. Each phase included re-configuring space within the building to house the new master control room, television production control room, five new radio studios, news production booths and conferencing areas.

The new multichannel digital master control room has a 16:9 projection screen and also has ergonomic access to all workstations, allowing multiple activities to take place simultaneously. The new production control room was built around the Ross Synergy 3 digital production switcher. Synergy was the best fit, offering simultaneous 4:3 and 16:9 aspect ratio conversion. The switcher can control the existing routing system and video servers. Synergy is used for live and post-production purposes giving quality video production.

Another step in the renovation was the major reconstruction and installation of five new radio studios. The studios were designed with the flexibility to handle workflow for live produced talk radio and various music genres. Each studio was designed with special modifications to adapt for TV and video, including the installation of a lighting grid and attention to camera placement. Wheatstone easily integrated TV and radio to route the digital audio from one venue to another within the building.

The integration was, in part, managed using VidCAD software to build 3-D views of the installations to plan and manage cable runs prior to and during installation. The main challenge during the renovation was maintaining current operations.

As an early adopter of many new technologies, the facility's design had elements that had not been fully implemented before in a broadcast environment. These innovations involved an overall attempt to streamline the process of putting both TV and radio programs on the air by integrating traffic and automation in a way that would allow WXXI to know what content was available and where the program is archived so it can be retrieved for air.

The new television and radio broadcast facilities have proven to be extremely successful and have a big impact on the look and feel of WXXI productions. ■

Design team

WXXI
- Kent Hatfield, VP tech. and op.
- Ed Wright, tech. op. mgr.
- Jan Pazral, chief eng.
- Nolan Stephany, maint. sup.
- Eric Fundin, production mgr.
- Dave Sluberski, sr. audio eng.
- Phillip Frigm, network admin.
- Micah Nelson, network admin.

Hunt Engineering Group
- Nancy Mangano, dir. of design
- Valerie Millard, sr. interior designer

Technology at work

Grass Valley servers, routing control
Miranda video converters and display scalers
NVISION
- Envoy video routing
- NV3512 digital audio router

Panasonic
- DVCPRO field cameras
- Studio tape equipment

Pinnacle
- FX Deko CG
- Liquid Edition NLE
- Liquid Chrome NLE

Ross Video
- Synergy 3 SD switcher
- Terminal gear

SeaChange media servers
Sony HDC-700A cameras
Wheatstone
- D3, D5 and D9 consoles
- Bridge Router

Category: *New studio technology — network*
Submitted by: *Ascent Media Systems & Technology Services*

CPTV's
multicast mix of SD and HD

Connecticut Public Television (CPTV) grew to a statewide public TV broadcaster, becoming Connecticut Public Broadcasting (CPBI) when it joined forces with Connecticut Public Radio (WNPR) in the 1970s. Significant changes in technology and the organization's growth served as reasons for the facility's recent move and major upgrade. Ascent Media was selected to design and build a new technical infrastructure.

CPTV runs as a multicast operation, originating its analog service, four SD channels and one HD channel from broadcast headquarters in Hartford, CT. Signals are fed to four transmitter sites located around the state. Connectivity between sites is a combination of fiber, microwave and (for radio) telephone links.

New systems were designed and built for HD/SD SDI routing, production control, master control, ingest, camera shading, studios, feed record and transmission. Existing Avid systems were relocated for editing and post-production.

Two production studios were installed in a newly constructed first floor annex with three Sony HDC-930 HD cameras. Three Sony HDW-750 field camcorders are available to either augment the primary cameras or be used for separate productions. Adjacent production control rooms are based on a Sony MVS-8000 HD/SD switcher system and a CRT-based monitor wall cost-effectively shows SD and HD content during productions. Two audio control rooms, based on a Sony DMX-R1000 digital audio mixer, are capable of producing stereo and 5.1 surround mixes.

The network operations center (NOC) and transmission equipment rooms house more than 40 racks, containing the broadcast technical infrastructure, which includes a Sony HDSX-5800 SD/HD SDI router with embedded AES and a separate RS-422 layer — all under OmniBus control. Master control and ingest operations are based on OmniBus automation with an Omneon Spectrum video server while a Miranda Presmaster master control switcher using SD and HD Imagestores provides on-air signal processing and switching. A MassTech MassStore archive management system controls a StorageTek L700 tape library and also provides low-res proxies. A pair of Miranda K2 multi-window display processors with Clarity Lion DLP-based rear projection displays support HD and SD outbound signal monitoring. Adjacent to the Clarity displays are five racks of CRT monitors for inbound feed and off-air signal monitoring.

Three SD/HD ingest workstations are located in the NOC, each containing an OmniBus computer, video monitoring and Videotek VTM series QC equipment. Behind the operators is a row of racks containing VTRs of various formats to handle all of CPTV's ingest and dubbing needs. To access the various servers, workstations and computers, a 64x16 KVM router from Raritan was installed, enabling operators to control the system throughout the facility.

By building the new system and then forward feeding it from the old building, transmission continuity was assured. The facility switched to the new system in the middle of a program segment — seamlessly. ■

Design team

Connecticut Public Broadcasting
- Meg Sakellarides, CFO
- Haig Papasian, VP eng. and op.
- Joe Zareski, dir. of eng.
- Kim Grehn, general mgr. (WNPR)
- Gene Amatruda, dir. op. (WNPR)

Ascent Media
- Tom Michales, proj. mgr.
- Bert Swackhamer, proj. eng.
- Chris Crummett, design eng.
- Jerry Stalder, design eng.
- Chris Finn, proj. leader/supervisor

Technology at work

- D.A.V.I.D. radio automation
- MassTech MassStore archive
- Miranda Presmaster MC switcher
- Omneon Spectrum server
- Omnibus automation
- SAS radio routing and mixing
- Sony router, cameras, switcher

Category: *New studio technology — network*
Submitted by: *Ascent Media Systems & Technology Services*

Discovery Communication's

control system reassigns audio and video to pods

The new Discovery Television and Technology Center in Sterling, VA, features a glass-enclosed, circular master control area surrounded by 10 transmission pods. Its control system is capable of transparently reassigning networks to any number of master control rooms. The facility was built to handle distribution for Discovery Communications' current U.S. networks and designed to seamlessly accommodate growth.

Ascent Media provided the technical integration services for the 53,000sq ft showcase that serves as the network origination for 13 of

Discovery's U.S. networks plus BBC America — comprising 17 network feeds. The facility can support any mixture of 64 channels of HD or SD programming and currently provides West Coast feeds for three networks.

Each of the 10 transmission pods is easily configured by a push of a button and a click of a mouse to control up to six networks in any combination. These pods are monitored by three centrally-located supervisory positions, each of which can take full control of any network. This design, resulting in significant cost savings, also allows the networks to be moved from pod to pod with all their associated audio and video monitoring and control, error reporting, graphic control, and automation.

Three tightly integrated applications provide the key to this operational scenario. A custom-engineered Evertz MVP 3000 system with integrated packet routers serves as the core A/V controller for the entire facility. Each of the pods' MVP 3000s are responsible for all the audio and video monitoring, error display and logging and tallies, while also displaying all VBI information relating to a signal, such as closed captioning. The system takes full advantage of the extreme flexibility of the facility by reassigning any audio or video sources to any pod. With 20 images associated with each network, it supports and manages in excess of 640 inputs along with the connected audio, regardless of format. It also supports all the routing and control required to move formats between pods.

The other critical elements are a Miranda Presmaster multichannel HD/SD master control panel and the OmniBus Colossus automated transmission suite.

Discovery has its eye on the future with specialized technology that comprises a blended infrastructure of both broadcast and IT solutions. ■

Design team

Discovery
- John Honeycutt, sr. VP, TV op. group
- Greg Larvenz, VP, eng. sys. design
- Jonathan Perkes, VP, eng.
- Charlie Myers, dir. of eng. and tech. dev.

Ascent Media
- Paul Berg, sr. proj. mgr.
- David Liptak, lead design eng.
- Kenny Brueck, proj. leader

Technology at work

- Barco Overview CDR67
  - DLP displays
- Cisco
  - 6500 series switches
  - 3550 series switches
- Doremi
  - MCS servers
  - DLSP servers
- Evertz
  - MVP 3000 control system
  - 500 and 7700 series glue
- Front Porch Digital
  - DIVArchive manager
- Miranda
  - Presmaster MC panel
  - Imagestore MC switching and branding processor
  - Intuition branding graphics co-processor
- NVISION NV8256-Plus router
- Omneon SD and HD servers
- OmniBus Colossus automation
- StorageTek SL8500 archive

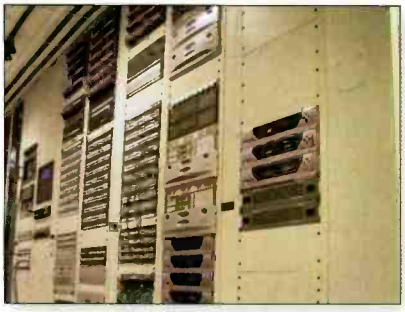
Broadcast Engineering 5th annual EXCELLENCE AWARDS

Category: *New studio technology — network*
Submitted by: *The Systems Group (TSG)*

ESPN
enhances its master control rooms

ESPN chose The Systems Group to design and build 10 master control rooms (MCRs) in its new 120,000sq-ft all-digital facility in Bristol, CT.

Each MCR is designed for baseband processing of 720p/60 HD video, along with routing to support eight AES pairs and processing to support four AES pairs simultaneously. Each source can be independently selected as either multilingual or multichannel on an event-by-event basis, if necessary.



The facility employs Pro-Bel's newest offerings, the TX-520 master control system and Morpheus automation. Each suite is outfitted with a standalone Pro-Bel Sirius HD/AES routing switcher system to provide a cuts-only facility in the event of primary switcher failure or maintenance.

Each of the three downstream processing/release chains are designed with a cascaded Miranda Imagestore HDTV branding system. A single Miranda Easysound SA audio inserter is allocated to each chain for audio VO and effect stings. Two branding chains are provided, in addition to the main path, for insertion of alternate branding and alternate commercial or promo media selection using the A/B mixer functionality that is integrated under both manual selection through Miranda PresStation and automated control under Pro-Bel's Aurora.

Morpheus automation provides comprehensive control over all devices within the MCR and is integrated into the campus-wide network alongside the existing systems for database access.

Each processing point within the release chains is protected with the first implementation of Videoframe Systems HD SDI relay system, teamed with multiple AES relays. Videoframe Systems also custom designed RS-422 transfer switches for use within the control system. Multiple preset configurations are instantly recallable through the use of Ethernet-based macro control panels.

A composite monitoring environment was created for the MCR operators using both Evertz MVP monitoring and conventional CRT-based monitors. The MVP system features Evertz's new G-Link fiber adapters, allowing a single fiber to be used for each of the two Christie displays. A standalone Pro-Bel Sirius AES router provides audio monitoring within the MCR. Level control is provided through an Adgil Director monitor control system. An Image Video TSI-1000 system collects relevant tally information from within and outside the MCR and keeps the operations staff up-to-date.

Each MCR is equipped with Raritan Systems' Paragon II KVM routing system, which connects all relevant operational and maintenance PCs within the MCR. ■

Design team

Adam Semcken, sr. design/proj. eng.
ESPN
- Ted Szypulski, dir. eng., special proj.
- Fred Tullock, sr. systems eng.
- Ed Potter, sr. systems eng.

The Systems Group
- Paul Rogalinski, proj. mgr.
- Bob Sharp, installation mgr./proj. eng.
- James Tome, sr. systems eng.
- James Slater, documentation support
- Vincent Lubrano, lead technician

Technology at work

Adgil Director monitor control system
EEG EN-530S closed-caption encoder
Evertz
- MVP display processor
- 7700-series fiber processing

Image Video TSI-1000 tally controller
Miranda
- EasySound ESSA audio inserter
- Imagestore HDTV logo generator
- PCS branding system controller
- PresStation manual control panel

Pinnacle MediaStream 8000 server
Pro-Bel
- Aurora router control
- Morpheus automation
- Sirius HD/AES routing switchers
- TX-520 HD MC switcher

Raritan Systems Paragon II KVM system
Videoframe Systems
- VF200 modular frame series
- VM-series modular control

Category: *New studio technology — network*
Submitted by: *AZCAR*

Medcom's

new facility brings six operations under one roof

Medcom is one of the Republic of Panama's largest and oldest broadcasters. It is also the county's rating and share leader, enjoying up to a 70 percent market share. The operation includes two national TV networks (RPC and Telemetro), one local TV station (Televiete), one national FM radio network (RPCRadio FM), one national AM Radio network (RPCRadio AM) and one local FM radio station (Caliente). Medcom has more than 30 transmitter sites and two microwave networks to cover the country.

With its completion, the new facility brings all Medcom operations under one roof. This new digital facility allows Medcom to take full advantage of sharing materials and resources to a degree previously not possible.

To assist them in achieving their business and broadcast goals, the operation selected AZCAR as its value engineering system consultants, designers and integrators and to provide complete equipment procurement services.

The primary goals were to consolidate and expand the television and radio broadcast interests into one facility and common infrastructure; integrate digital technology and shared storage architectures to produce substantial operating efficiencies and expansion opportunities.

There were two major design challenges. The first was to have the technical systems make the maximum use of shared elements while fully supporting the separate, independent and different radio and TV operations requirements. The second was to engineer the solutions to meet tight capital budgets.

The facility incorporates a shared, 100-plus rack central equipment room for both radio and television systems, including a Quartz 256x256 SDI and AES routing switcher with control and time code layers. There is one common TV master control area for the three program streams. The operation includes six studios, three for production and three for news, controlled from three video and audio production control rooms with a centralized camera control area that allows any studio to be operated from any of the control rooms. The operation required two fully separate systems. The large program production schedule required 18 NLEs and the integration of 34 existing edit suits of various manufacturers and vintages.

The radio plant boasts two fully independent production studios with associated control rooms and two on-air announce booths. The 96x96 AES router system and reference systems are shared with the television core systems. ■

Design team

Medcom
- Tony Perez, eng. mgr.
- Ivan Mirones, radio engineering

AZCAR
- John Jay, proj. mgr.
- Lawrence St-Onge, lead eng.
- John Chyurlia, design eng.
- Hakim Kharbut, design eng.
- Carlos Arancibia, design eng.
- Doug Waldron, installation supervisor

Technology at work

- ClearCom 128x128 intercom matrix
- Evertz MVP monitor walls
- Florical automation
- Leitch Newsflash and NLE systems
- Miranda PresMaster MC system with four streams
- Quartz 256 x 256 SDI/AES with control and time code routing switcher
- Ross Synergy production switchers
- Wheatstone consoles

Broadcast Engineering 5th annual Excellence Awards

Category: *New studio technology — network*
Submitted by: *Silicon Graphics (SGI)*

NBA Entertainment

creates high-tech sports powerhouse

NBA Entertainment is command central for all National Basketball Association (NBA) broadcasts, housing a production facility that literally captures everything that happens in each game, with up to a dozen games broadcasting simultaneously. It sends game broadcasts, clips and other NBA content to 214 countries worldwide. To improve its facility's ability to work with that content in a timeframe that is most valuable (immediately following the game) and put the games in a secure archive for preservation and future programming, it engaged Silicon Graphics (SGI).

As a first step, the facility purchased an SGI InfiniteStorage solution capable of storing more than 300 hours of high-quality MPEG-2 SD video, with plans to expand to 50TB or 2000 plus hours in the future. At the facility's headquarters in Secaucus, NJ, the data warehouse allows NBA production personnel to catalog and store all the action from every NBA game as it occurs.

SGI integrated the complex workflow for NBA Entertainment's broadcast production facility, which will now be able to instantly capture every play, categorize it and store it for fast and easy retrieval. Those capabilities are essential, as the digital facility is a quick turnaround production and distribution point for digital media globally every night the NBA is in action. More than 150 freelance editors produce nightly highlight reels in 15 integrated editing suites from the online digital archive. NBA Entertainment produces NBA TV, video packages for NBA.com, VOD packages for cable partners, short packages for cell phone distribution and customized video for online viewing on Web sites worldwide. It also indexes and serves video to the NBA Basketball Operations Group.

In addition to the archives of the past 12 seasons, the facility has partial seasons as well as film going back to the late '40s and early '50s. And for every current game, two staffers sit at the scorer's table logging every shot in the game, including who was involved in the play, where on the court it was shot from and, on a scale of one to five, how good a shot it was. That database gets tied to the official game clock and that, using the SGI system, gets tied to the SMPTE time code of the video of the game. As a result, the facility can do a low-res browse and edit of every shot captured.

NBA Entertainment's new 48TB SGI InfiniteStorage SAN/NAS 2000 solution provides universal data access and flexible, scalable and secure high-performance network-attached storage (NAS). The solution also incorporates the StorageTek SL8500 tape library. The InfiniteStorage solution can easily expand to increase network bandwidth, adding hundreds of terabytes of data.

The NAS solution is already growing into a full SAN with SGI InfiniteStorage Shared Filesystem CXFS, which combines the flexibility and ease of use of NAS with the power and speed of SAN architecture, with no data conversion necessary. This growth will enable NBA Entertainment to expand to 23 Liquid Blue nonlinear editors and add 16 Snell & Wilcox Asteroid SD/HD MPEG-2 MXF encoders exclusively for ingesting its archive. ■

Design team

NBA
- Steve Hellmuth, vp tech.
- Mike Rokosa, sr. dir. eng.
- Keith Horstman, dir. app. dev.
- Dana Stone, dir. digital media mgmt.

SGI
- Bill Buhro, media solutions architect
- Tony Karam, program mgr.
- Dale Brantly, systems solutions architect

Technology at work

Pinnacle 15 Liquid Blue NLEs (23 when fully implemented)

SGI
- Filesystem CXFS
- 48TB InfiniteStorage SAN/NAS 2000
- InfiniteStorage Shared StorageTek SL8500 tape library

Snell & Wilcox 6 Asteroid SD/HD MPEG-2 MXF encoders

RAI's new NYC location and asset management

The Systems Group (TSG) of Hoboken, NJ, was awarded a design build contract to relocate RAI's New York City bureau to a new location in downtown Manhattan. The New York facility operates the North American news bureau for the Italian broadcaster, providing daily programming to corporate headquarters based in Rome. The North American location has operated out of New York City for more than 40 years, supporting

upwards of five networks and other RAI subsidiaries, including RAI 1, RAI 2, RAI 3, RAI News International and RAI News 24.

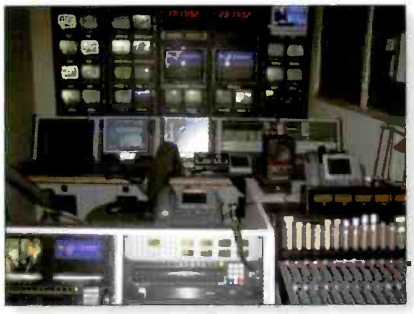
An innovative asset management system was required to maximize the overall operational efficiencies, with a goal to increase the productivity and dependability of the system. TSG began feasibility and consultancy work in 2004. It was tasked with space planning, mechanical and electrical design of broadcast spaces, along with designing a tapeless SD broadcast facility. The transition to was completed in July 2005.

The new facility is based around a Grass Valley network-attached storage (NAS) server system. The system allows RAI the flexibility to ingest, edit, log, playback and archive all of its media assets from radio newscasts to long-form talk show-style productions.

The facility also has embarked on the blue laser transition with the deployment of three Sony XDCAM camcorders into the field for acquisition. TSG designed and built four edit bays based around the XDCAM format with the Grass Valley NewsEdit for nonlinear editing and ingesting into the NAS.

The NAS also uses the Grass Valley Ingest Station, allowing RAI to control the 64x64 Concerto router and allowing a centralized point for ingesting incoming feeds directly into the NAS. Once ingested, the editors and control room operators have the ability of playout or editing of the recorded feeds immediately.

Also within the NAS topology are multiple licenses of NewsBrowse, allowing RAI's producers to browse all assets on the NAS, view them at their desktops and add metadata.



In certain cases, producers have the ability of conforming assets at their desktops and publishing back to the NAS for playout.

The facility is a diverse all-digital

location with a radio station, radio production studio, five edit rooms, two control rooms, two studios, insert camera positions and rooftop standup locations. ■

Design team

The Systems Group
- Carl Van Dusen, sr. proj. mgr.
- Michael Panico, sr. sys. design eng.
- Mahmoud Awad, test eng.
- Justin Francione, integration supervisor
- Chris Brown, lead technician
- Trissa Dudzinski, proj. coord.

RAI
- Michael Hariban, head of prod.
- Sal Paglia, chief eng.

Technology at work

Grass Valley
- Kayak switchers
- NewsEdit NLE
- IngestStation
- Concerto router
- NewsBrowse

Harrison analog audio consoles
Image Video under monitor displays
Leitch master clock system
Raritan KVM routing
RTS Adam intercom system
Tektronix reference and T&M
Telemetrics robotics system

Category: *New studio technology — network*
Submitted by: *Turner Broadcasting System/Tektronix*

TBS' digital broadcast hub

After years of considerable expansion, Turner Broadcasting System (TBS) had outgrown the broadcast facility on its 33-acre Atlanta campus. It broke ground on a new, 198,000sq ft building in 2000.

The intent was to develop a broadcast hub that would house TBS' numerous networks, accommodate ongoing business growth and have the capacity to support emerging broadcast technologies and distribution channels.

Today, the facility accommodates 35 outgoing feeds and has the ability to ingest 74 simultaneous feeds. It houses a 300ft central equipment

room with more than 400 racks of equipment and servers. Fifteen control rooms are currently employed, with the capacity for 28 total.

Using an innovative design, the facility is sectioned into pods, which contain four control rooms and one or more networks each. Control rooms feature at least a pair of redundant systems, with multiple sets of servers, switches and graphics processing equipment. The design creates isolation between the pods; system malfunctions in one pod can't affect network operations in other pods. It also creates redundancy within them; each pod has its own backup systems.

Test and monitoring equipment is an essential component to the new facility. A variety of Tektronix instruments — including a WVR7100, WFM700 and MTM400 — are used in each pod to monitor broadcasts, keep track of the various channels being transmitted and automatically send alerts when broadcast errors occur. Tektronix instruments are also used routinely throughout the building for quality testing and optimization.

The facility's advanced testing, monitoring and backup capabilities ensure the company's broadcasts are overwhelmingly stable and error-free. The entire facility is digital, employing a file transfer infrastructure. All of the company's content is stored, transferred, distributed and repurposed digitally using a fiber-optic cable network.

The file transfer infrastructure saves incalculable cost, space and time in the storage and distribution of content. In addition, it provides the ability to easily change the format and resolution of files digitally for quick and inexpensive reuse of content or redistribution to alternate channels. TBS is already reaping the benefits of this file-based system, seamlessly repurposing and feeding content to cell phones service providers and VOD broadband carriers.

The content files are contained in a five-tier storage system, which includes Pinnacle and Omneon play-to-air servers; a central cache for advertisements and short-term storage (EMC CLARiiON arrays); longer-term storage by serial ATA drives; an Asaca DVD Jukebox short-term storage system to backup the central

cache; and StorageTek robots for longer data tape files. TBS is also experimenting with InPhase holographic discs for the storage of large HD files and other lengthy content.

TBS' new facility is now three times bigger and supports emerging technologies and distribution channels. ■

Design team

TBS
- Clyde Smith, sr. VP, broad. eng.
- Ron Tarasoff, VP broadcast tech. and eng.
- Naveed Aslam, sr. dir.eng.
- Jack Gary, sr. dir. proj. and integration
- Jim Bernier, eng. proj. mgr.
- Rick Ackermans, dir. acquisitions and transmissions
- Michael Cody, proj. mgr.

AZCAR
- Tony DuBois, eng. proj. mgr.

Mcsi
- David Priester, eng. proj. mgr.

Technology at work

- Pro-Bel Sextant 4 and Morpheus automation
- Pinnacle Media Stream and Palladium Store 1000 servers
- Tektronix WVR7100 rasterizers and T&M equipment
- Quartz QMC HD switchers
- Snell & Wilcox Memphis HD
- Chyron Clyps HD and Duet HD Graphics Units
- Linear Acoustics OCTiMAX 5.1 and upMAX 2251 audio processors

ESPN's high-definition heaven

ESPN's 120,000sq ft, all-digital HD digital center in Bristol, CN, is the future of broadcast production, based on digital technology, and it's paying huge dividends today. Networking and automating many of the labor-intensive processes has led to reduced errors and continued system reliability. If there is such a thing, this is HD heaven.

A signal distribution and processing system design has been implemented to support nine different TV networks that originate from Bristol. These include all U.S.-based ESPN distributed channels and are supported by the facility's massive signal routing architecture that feeds more than 19 nonlinear edit rooms, four master control suites and a large sports content ingest screening area. Signal paths can be changed quickly to accommodate new channels and future internal growth.

The facility features resilient, physically dispersed HD SDI and AES signal paths throughout the building, requiring more than 7 million ft of coax and fiber-optic cable to handle a mixture of SD and HD signals.

Now in its second year of distributing more than 470 HD live sports telecasts on its ESPN HD and ESPN2 HD channels, ESPN distributes its highest-rated programs, including "SportsCenter," in the 720p HD format. These widescreen telecasts, with multichannel AES audio, are supported by a large variety of multiformat broadcast equipment to produce more than 6000 hours of originally produced HD programming annually.

The immense requirements of ESPN's production infrastructure is handled by multiple racks of HD routing switchers (configured as four dispersed 1024x512 I/O matrixes for HD video signals) and a similarly dense AES router to handle audio routing. The video router can handle both SD and HD signals in the same frame. Control of the routers is through a centralized facility control system.

To support its signal distribution paths, the facility has installed hundreds of modular equipment products to route digital audio and video signals to routers, production switchers, audio mixers, and other destinations.

There's a large complement of nonlinear editing and media server equipment, including 25 edit systems tied to 68 main media servers to distribute media on and off the SAN that currently includes a capacity of more than 3500 hours (in SD mode).

The facility houses three HD studios, which are home to all ESPN Bristol-based studio shows, including "SportsCenter." To capture its live shows in widescreen (16:9 aspect ratio) 720p, ESPN is using 20 multiformat HD cameras. Fiber-optic transmitters and receivers, in tandem with air-blown fiber between buildings on the Bristol campus, has enabled the facility to network seven studios via more than 1000 fiber-optic circuits. ■

Design team

ESPN
- Rob Hunter, sr. dir., systems eng. and media tech.
- Bill Lamb, VP systems eng. and tech. support
- Kevin Stolworthy,sr. VP, production op.
- Ted Szypulski, sr. dir., proj. dev.

National TeleConsultants
Doyle Technology Consultants
The Systems Group

Technology at work

Calrec Alpha 100 audio consoles
Evertz
- MVP-3000 display processors
- 7700 series fiber-optic gear

Grass Valley
- Trinix HD routing
- Apex Plus routing switchers
- Concerto routing switchers
- Encore control
- Kameleon distribution amplifiers
- Kalypso production switchers
- LDK-6000 studio cameras

Miranda
- Densité and Symphonie distribution amplifiers signal conversion modules
- ImageStore network branders

Pro-Bel
- TX-510HD MC switchers
- Sirius and Halo signal routing
- Morpheous automation

Quantel
- sQ servers, Qedit Pro editors

Broadcast Engineering 5th annual EXCELLENCE AWARDS

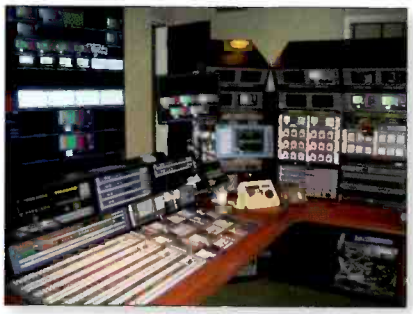
Category: *New studio technology — HD*
Submitted by: *The Systems Group (TSG)*

NBC's SNL

moves to a new HD studio

NBC's Saturday Night Live (SNL) kicked off its 31st season from its newly rebuilt Studio 8H control room.

NBC chose The Systems Group (TSG) to help design the new studio. To meet the tight deadline, the new control room was built adjacent to the old, in a space previously occupied by wardrobe and props. To achieve the requirements for the new rooms, the

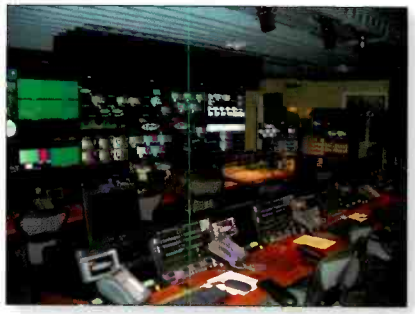


facility had to be gutted and rebuilt. TSG had less than three months for installation, wiring and configuration.

The three-tier main production control room was designed to be flexible. NBC wanted to create a space that could be used for any show, rather then tailoring it specifically to SNL's needs. Extra communication gear and sources were added to support large news-style broadcasts. The control room support systems were tied together to allow single-button snapshot recalls. The facility didn't want to be limited to using this functionality only for reconfiguration between shows. This allowed the director to switch monitor wall layouts between sketches to ensure that the technology supports the creative process rather then becoming an obstacle to it. Tight integration between the Grass Valley Encore router control system, four-frame Evertz MVP system and the 12 Barco DLP projectors allowed the presets to be recalled instantly and transparently. A secondary MVP system feeds Sony LCDs in the graphics and audio rooms to allow flexibility.

The video control room was designed to support 12 CCUs, eight VTRs, four DDRs and a wealth of conversion gear. The graphics room operators control a Pinnacle Thunder XL and Deko 1000. Existing SD graphics hardware was temporarily reused pending NBC's migration to an HD graphics platform. All sources feed into a local 256x256 Grass Valley Trinix router, which supports the entire production operation. The facility is also fed by a new 1024x1024 core router, which provides inbound feeds and other playback sources.

A Calrec Alpha 100 with 128 digital inputs and 224 analog inputs



in the audio room is used to mix microphones and incoming audio. Both a 5.1 and L/R audio mix are distributed throughout the building to facilitate different monitoring scenarios in a variety of locations. A 124-input Euphonix System 5 console in a separate sound effects room is sourced by an array of samplers and digital audio workstations.

One of NBC's goals was to move to a fully embedded HD SDI audio plant. Miranda modular products embed and process audio and metadata as it comes up from the core and leaves the complex. While this adds complexity to the source and air chains, it avoids latency issues in downstream processing. It also allows a single-cable to carry the entire air-ready signal out of the facility. ■

Design team

The Systems Group
- Kevin Henneman, proj. mgr.
- Gene Hammerle, proj. mgr.
- Jared Miller, video eng.
- Christian Dam, audio eng.
- Adam Semcken, sr. systems eng.

NBC
- Larry Thaler, dir.distrib. proj.
- David Lazecko, proj. mgr.
- Paul Winter, video eng.

Technology at work

- Barco OverView mDR+50-DL 50in DLP projectors
- Calrec Alpha 100 console
- Digidesign Pro Tools
- Enco Digital audio workstations
- Euphonix System 5 console
- Evertz
  - 5600MSC reference generator
  - MVP multi-image viewer
- Grass Valley
  - Trinix router
  - Encore control system
- Miranda
  - Densité series distribution
  - Imaging series format conversion
  - XVP-801 crossconverter
- RTS/Telex Adam Intercom Matrix
- Sony
  - MVS-8000 HD production switcher
  - HDC-950 cameras
  - BVM-D Series monitors
- Ward Beck 8200-series
  - AES distribution

Category: *New studio technology — HD*
Submitted by: *Evertz*

Rainbow's
HD origination facilities

In 2001 Rainbow Network Communications (RNC) moved into new television facilities located in Bethpage NY. Systems designer and integrator Communications Engineering, Inc. (CEI) of Newington, VA, provided engineering and implementation services for the original Bethpage facility, and was assigned the task

of engineering and implementing the new operations and origination facilities into the existing 42,000 sq ft of technical space. Having already built an HD backbone in the first facility phase, CEI was challenged with building the new infrastructure, which included a cluster of HD-specific functions as well as extensive HD and SD expansion of the existing Rainbow core facilities; all without interrupting any daily or ongoing operations.

The first challenge required seamless integration with existing operations The new facilities included a complement of HD live master control rooms, HD multichannel playout control rooms, HD quality control/ingest suites and HD linear and nonlinear editing suites. The second issue was creating new technology to meet the desired needs and requirements. It was decided that Evertz Microsystems had technology well-positioned to meet the challenge and would accommodate Rainbow's requirements.

New solutions for signal processing, encoding/decoding and timing resolved challenges related to the format-quagmire, real-time signal monitoring, and getting more efficient use out of each QC station. Evertz developed modular closed captioning processes, frame synchronizers, audio channel shufflers and format converters.

The Evertz multi-image video processor (MVP) became the monitoring backbone of the operations in the facility. The MVP system is flexible and provides signal quality monitoring and alarms. It integrates with the VistaLINK, all of which is part of the key strategy to use monitoring and configuration software for real-time access to hundreds of network nodes throughout the facility.

All critical processes in the signal path are controlled by VistaLINK, which is an SNMP-enabled monitoring and control system. Furthermore, the Evertz MVPs monitor all analog and digital HD and SD signals entering or leaving the facility via fiber and satellite, displaying video signals across 40 plus Clarity Bobcat LCDs. The SNMP connectivity allows facility engineers to provide corrective maintenance by pinpointing a possible signal or component failure quickly and efficiently. ■

Design team

CEI
- John Wesley Nash
- Jim Conley

Evertz
- Romolo Magarelli

Rainbow
- Mike Mallozzi

Technology at work

Accom
- Dveous MX DVEs
- Axial editors

Avid HD Nitris edit suites
Chyron Hyper HD CGs
Clarity Bobcat 40in LCD screens
Dolby 5.1 and Dolby E audio processing

Evertz
- Video and audio frame sync.
- VistaLINK monitoring and control
- MVP multi-viewers
- Downstream logo insertion

Globecom
- GSI transmission shelter
- 9-meter satellite antenna

Grass Valley
- Trinix SD/HD hybrid router
- Profile PVS2000 HD servers
- MC2100 HD switcher
- Kalypso production switcher

Harmonic transmission and compression equipment
Harris multichannel automation control
Motorolla transmission and compression systems
Panasonic HD VTRs
Quintech L-Band distribution system
Tektronix WFM700 T&M
Videotek VTM400 monitoring
Yamaha DMX1000 mixing boards
Zaxcom Aria mixing boards

TBS'

HD and file-based capabilities

The Turner Broadcasting System (TBS) Digital Network Operations Center in Atlanta, which opened in 2003, continued its dynamic evolution in 2005 with the addition of new HD and file-based capabilities. The 198,000sq ft facility has now been upgraded with a new HD signal paths. New developments also include the implementation of control and monitoring using SNMP and replacement of video servers on the ingest side with generic ingest products from Snell & Wilcox.

More than 7000 Snell & Wilcox IQ modular units installed in 800 different frames form the key pieces of Turner's SD networks. Now an HD signal path has been added on top of the facility's SD layer, for which an additional 2000 Snell & Wilcox IQ modular units serve as the backbone. Both the HD and SD equipment is controlled and monitored via the Snell & Wilcox RollCall network management system installed in the transmission operations center, where operators use a graphical infrastructure model to isolate the behavior of specific devices or even individual processing cards anywhere in the facility. Snell & Wilcox RollSNMP allows the RollMap monitoring features to be applied to other vendors' SNMP hardware and software products, delivering a complete broadcast-centric monitoring environment encompassing video and audio signal paths, hardware enclosure status and fingertip access to control from a single location.

For each SD and HD channel, content is played out from Pinnacle MediaStream servers or Omneon Spectrum media servers under the control of two independent Pro-Bel automation systems. Content is then run through two separate Grass Valley or Quartz master control switchers in a dual-path, fully redundant routing control infrastructure. Each Turner channel has an A and B chain, and other than being locked to the same GPS satellite, the two chains are not connected in any way.

The move toward HD is made possible by the network's five-tier, file-based central archive, or Broadcast Inventory Manager (BIM). All of Turner's on-air video servers are tied to the BIM, which comprises 28TB of fully redundant EMC CLARiiON FC4700 arrays, along with 4TB of serial ATA CX500, two AM-1450 DVD libraries for commercial and promo backups, two StorageTek Powderhorn and two StorageTek SL8500 data tape libraries.

The BIM's central cache holds 25,000 active commercials and 49,000 active promos, with content stored simultaneously in four different places. EMC Avalon intelligent data software enables transmission speeds of 1Gb/s among BIM components.

Immediate upstream of the storage mechanism is the Snell & Wilcox MEMPHIS HD encoder. Barco monitor walls running Hydra iStudio multi-image display processors allow operators to monitor streams. ■

Design team

Turner Network operations engineering
Broadcast Technology Group

Technology at work

ASACA AM-1450 DVD libraries
Barco Hydra multi-image display
Chyron
- HyperX graphics
- Aprisa graphics
- Duet graphics

EMC CLARiiON FC4700 arrays
Grass Valley
- Trinix routers
- M2100 master control switchers

NVISION fiber-optic transmitters
Omneon Spectrum media servers
Pinnacle MediaStream 900 servers
Pro-Bel automation
Quartz QMC HD MC switchers
Scientific-Atlanta IRDs
Snell & Wilcox
- IQ modular products
- RollCall and RollSNMP

Tektronix audio/video T&M systems

Category: *New studio technology — non-broadcast*
Submitted by: *Media 3 Ltd.*

Columbia Business School's

compact broadcast system solves space issues

In a competitive environment, universities, just as corporations, need to market their products by presenting a strong public image. Columbia Business School in New York City is no exception. The school's renowned scholars, teachers and faculty members are on the cutting edge of issues affecting the marketplace and are available to share their expertise with reporters and editors. This task has been made easier and more effective with the recent installation of a television broadcast facility at the school's uptown campus.

Before the new studio, faculty experts had to fight Manhattan traffic

to travel downtown, or go to distant locations to participate in business and financial news programs. Dean R. Glenn Hubbard, who makes regular appearances on PBS' "Nightly Business Report," used to spend three hours round trip to make his appearance on the show. Now, he walks to the new studio in Uris Hall, completes the interview and is back in his office in 15 minutes.

Floor space in Manhattan is always at a premium and is scarce on the campus. Before construction of the new media room, post-production editing was done at a desk in an AV equipment rack room.

The project team identified a computing lab that, with some redesign and custom millwork, could be reduced in size and retain 80 percent of its seating capacity. The space was divided in half, one half for the media room and control room and the other half for the computing lab. Luckily, the space was located at the core of the building so soundproofing was not needed to deaden street noise.

Due to limited space and budget, the selection of a live broadcast system became a prime consideration. Ease of use was a secondary objective. The multimedia staff looked at several systems, but they were all component-based took up too much room, seemed overly complex and required engineering.

In the end, the staff purchased a BureauCam BCSO-2500 system by Media 3. BureauCam is a compact, fully integrated broadcast system designed to provide live shots for local and remote operations via network or dial up.

Because everything is built into the system, installation was simple, and the school was quickly able to make a fiber-optic connection to a local


Media Studio – Uris 302b

routing hub to broadcast to all major U.S. and foreign markets. The entire project was fast-tracked and took only four months from the initial suggestion to lighting the fiber.

Besides regular use by faculty for live broadcasts, the new facility has increased the school's overall video production capability. Professors use the studio to record teaching materials for classroom use, distribution to students and streaming over the Web.

The new facility also created an unexpected revenue stream from non-university users looking for an uptown studio for live broadcasts. ■

Design team

Columbia
- Angela Adames, proj. management
- Chris, Bellerjeau, multimedia services
- Alex Smith, multimedia services

Integrated Design Group
- Barry Erenberg, architect
- Ben Perez, architect

Media 3
- Bill Keane, studio consultant
- Damon Haimoff, studio consultant

Ascent Media
- Jim Sevier

Technology at work

Dell dual CPU edit workstation

Electro-Voice RE-20 AT mic

SDN phone patch

JVC DVD hard disk recorder

M Audio studio monitors

Media 3 BureauCam 3 BCSO-2500

Rane EQ

Sharp DVD recorder

Sony
- DXC-990 camera
- BCS-500 robotic tilt head
- ECM-77B mics
- PVM production monitor
- DSR 11 DVCAM VTR

Telos Zephyr
- XStream ISDN encoder/decoder

Broadcast Engineering 5th annual Excellence Awards

Category: *New studio technology — non-broadcast*
Submitted by: *Network Electronics*

Louisiana State University's

Football Operations Center moves to SDI

Louisiana State University (LSU), in Baton Rouge, LA, takes its collegiate athletic program seriously. So seriously, in fact, that the school recently launched a 150,000sq-ft Football Operations Center to ensure its teams have everything they need to succeed. The $15 million, all-in-one facility includes offices, a locker room, an equipment room, an indoor football field for game preparation and an elaborate video operations center with an extensive technology package to drive training efforts to the highest possible level.

A heavy investment in legacy component and composite gear prevented LSU from immediately reaching its goal of a total SDI infrastructure. Working with Technical Services Group (TSG), a full service electronic systems contractor, the university implemented a phased approach to take full advantage of its current equipment as it transitions to SDI. TSG designed and built the complete technology layer of the center based on the university's objectives and expectations and provided project management services for the plant.

Price point and flexibility played equal roles in equipment selection, particularly router choices. LSU went with a robust Network Electronics routing system to bridge the gap between component and composite gear and an SDI format. The university established a virtual SDI domain within the existing SDI and non-HD SDI infrastructure using the modular and compact routing system's ability to transparently route component signals through transcoders and into the facility's new VikinX VD3232S SDI router. The configuration allows for an easy migration to SDI and HD SDI as legacy gear is replaced and formats move forward.

The university also took advantage of Network Electronics' new CP-MDP router control panel, which provides a live video preview of both sources and destinations via a QVGA high-resolution color graphics display. The CP-MDP capabilities allowed operational setups to be programmed as opposed to mere source selections. The capability greatly enhances efficiency as well as streamlines workflow more than the traditional method of manually selecting multiple devices during a rigorous time-sensitive daily routine.

Total migration to SDI will become a reality in phase two, slated to commence in another year. The extensive audio and video system, which touches every part of the building, will route HD-SDI signals to all displays within the facility via Network Electronics' VD3232S. The 32x32 router will be expanded to 64x64 to meet the demands of the tasks that include support of the Exos Sports online storage system as it converts to SDI. The complex setup also includes extensive HD capabilities integrated into its AV presentation solutions, plasma and video displays and playback. ■

Design team

Technical Services Group
- Arthur M. Hoover, president
- Stephen Gimbert, design consultant

Network Electronics
- Cameron Francis, president, CEO

Louisiana State University
- Doug Aucoin, football video director

Technology at work

Creston control system

Flashlink
- DAC-SDI transcoders
- ADC-SDI-CC transcoders

Multibus
- X-Y control panels
- CP-MDP-CL MC panels
- CP-16LCD programmable control panels

Network Electronics
- VikinX VD3232S router
- V3232 router
- A3232 router

Panasonic HD display products

Syscon-SM system controller

USTA's
National Tennis Center distributes audio

Reliable, noise-free audio signals have always been important to the United States Tennis Association (USTA), which sponsors the U.S. Open that ran from August 29 to September 11 at the National Tennis Center. CBS Sports and USA Network broadcast the event, which is one of the highest attended annual events in sports, with as many as 24 foreign broadcasters providing coverage to their home countries. The 2005 championship match set several new records for attendance and Web site traffic and generated significantly higher TV ratings than prior years. The facility includes three stadiums, 15 field courts and numerous smaller buildings.

With the growth of the event, however, problems with audio feeds began to surface due to the increasing number of reporters and broadcasters plugging into the audio system with a wide variety of recorders, mixers and other electronic equipment. Grounding, crosstalk and backfeed noise issues were occasionally created. The essence of the problem is

the magnitude of the event — audio feeds serving 40 broadcast commentary positions and a primary interview room accommodating 140 people. The challenge was to accommodate everyone, even those taking the feed with less than professional grade equipment, with a clean, consistent signal.

AVVIT Consulting in New York City, consultants to the USTA since 1992, are responsible for designing all of the audio, video and television systems at the facility. AVVIT selected the Network Electronics analog audio distribution amplifier system to provide the audio signals coming from the court, umpire and stadium announcer microphones to the press booths and interview rooms.

The Network Electronics equipment met a variety of criteria all at once. The fact that the outputs were isolated and buffered was critical to the application. In addition, the compact card form factor of the DA, how the redundant power supplies fit into the cardframe, the circuit design and the cost were significant parameters in the choice of the product. The system included a six-frame (FR-2RU-10-2-F frames) network with 37 DA-AA distribution amplifier cards and three PWR-AC 15/5/5/5V redundant power supplies. Custom breakout cables were provided by Gepco.

Norcon Communications, a company involved with USTA and the U.S. Open since 1977, served as the system integrator for the project, installing the frames and contributing wiring and cable management. The final result: six channels of distributed audio running all over the place for 14 days flawlessly. ■

Design team

AVVIT Consulting
Network Electronics
Norcon Communications

Technology at work

Network Electronics
- FR-2RU-10-2-F frames
- DA-AA distribution amp cards
- AC15/15/5/5V redundant power supplies

Broadcast Engineering 5th annual Excellence Awards

Category: *Station automation*
Submitted by: *OmniBus Systems*

Bay News 9

shifts to automated server-based facility

Bay News 9 of Tampa, FL, has shifted its broadcast operations to a new 23,000sq ft facility that houses automated server-based production and playout for the 24-hour local news channel, as well as the network's weather, on-demand and Spanish channels.

More space was needed to accommodate the joint broadcast operations of the network's different channels. The engineering and design team also sought to put playout under the umbrella of a single flexible and scalable automation system that could adapt to the company's future growth. Shared and easy access to media in standardized formats for streamlined production and playout was another key element in the facility design.

Ascent Media was chosen to integrate and install the facility's broadcast systems. The facility features integrated control and studio spaces. Two control rooms and one master control room, separated by glass walls, allow staff to make visual contact and voice contact over the intercom. The facility boasts four studios that can be used interchangeably and run simultaneously in English or Spanish to facilitate regular production as well as breaking news and weather coverage.

Under the umbrella of OmniBus Systems' Columbus automation, the four news channels share media via centralized storage on a Pinnacle Systems Vortex media server with 1000 hours of storage at 25Mb/s. An archive storage solution from ASACA is integrated into the system to allow any user at any desktop to pull video from archives.

The automation system serves as the facility's central interface for controlling devices, getting feedback and relaying playout messages. The OmniBus Desktop Control (ODC) interface gives the station's reporters and other staff the ability to search and browse archived material, create graphics, put production elements for studio events into the script and control a variety of other functions from a single desktop. The ODC user interface is installed at all edit stations in the newsroom, at all workstations within the facility and, through a dedicated WAN, at each of the network's remote bureaus.

The real challenge proved to be moving all four channels and the station's online news source to the new studios, control room and newsroom.

Four hurricanes forced the network into a short timeframe for systems planning and building. However, the network launched broadcasts from its new facility on June 27, 2005, without taking programming off air. ■

Design team

Bay News 9
- Elliott Wiser, VP/GM
- Steve Weitekamp, dir. of op.
- Sean Carpenter, sr. eng.
- Jorge Gimenez, IT mgr.
- Thom Savela, Web master
- Mike Gautreau, news dir.

Technology at work

- AP ENPS newsroom software
- Brightline studio lighting
- Evertz
  - MVP monitor routing
  - FX Scenery & Design studio sets
- Grass Valley
  - Trinix video routing
  - Apex audio routing
  - Kalypso Duo video switcher
  - Hitachi cameras
- Image Video tally
- OmniBus Systems
  - Columbus automation
  - Desktop control (ODC)
- Pinnacle
  - Vortex editing and storage
  - Deko 3000 graphics
- Radamec robotics
- RTS/Telex ADAM intercom
- VertigoXmedia graphics interface
- Wheatstone D9 audio consoles

Category: *Station automation*
Submitted by: *Sundance Digital*

Roberts Broadcasting's

centralcasting solution

When Roberts Broadcasting acquired licenses for WRBJ-TV and WZRB-TV in Jackson, MS, and Columbia, SC, respectively, discussions ensued regarding the best operating scenario. The organization was already broadcasting WRBU-TV, the UPN affiliate in St. Louis, MO, from a traditional, single-channel master control room.

Following extensive number crunching, the debate pitting independent setups against a centralcasting solution culminated with plans for an elaborate and geographically-disparate central model that would require a substantial overhaul of master control.

WRBU serves as the hub for the three-station system. WZRB went on-air in January 2005, with WRBJ-TV slated to follow suit in January 2006. The infrastructure upgrade doubled server and satellite dish capacity to accommodate the dramatically increased demands on a centralized operation that downlinks an average of 28 feeds daily and will grow with the launch of WRBJ.

The organization's automation system needed to bulk up, as well as be as future-proof as possible. Because WRBU was already a long-term, satisfied Sundance Digital client, it was an easy decision to upgrade to a three-channel Titan package with four Media Prep stations managing the content on a multiple Grass Valley Profile video server system. Titan is an extremely flexible automation solution, designed to easily add playlists to a growing network's roster and answer the challenges of high-channel counts and geographically-dispersed operations. In addition to the Profile servers, the facility's configuration controls a Grass Valley Concerto 128x128 router, two PVS1022 servers, two PVS1108Ds, two PFR5180 raid arrays, two PFR7146 raid arrays with a total combined storage of 650 hours and a Quartz QMC-SD master control switcher. The automation system is interfaced with the station's Wide Orbit traffic manager.

All operations originate from the St. Louis plant. Transmitters are the only equipment found in Columbia, 750 miles away, and in Jackson, 450 miles from the hub. All signals are uplinked to the spoke stations after processing through master control. A Miranda Kaleido Alto monitor wall comprised of two plasma screens with 10 inputs each is suspended from the ceiling. It enables one master control operator to easily monitor all three sites. In preparation for its January launch date, the Jackson channel is being used for staff training.

All 24/7 stations, the group receives only two hours of UPN affiliate programming per night, filling the remaining 22 hours with syndicated feeds downlinked into the satellite field in St. Louis and then switched to all three stations. To accommodate the significant quantity of content, the main facility installed Sundance Digital's Intelli-Sat broadcast record manager to record programming and interstitials into PVS1108D ingest and prep servers where operators review, trim and mark clips "ready for air." Sundance Digital's DataMover transfers the material to the appropriate PVS1022 on-air server where it may reside for up to three days prior to broadcast.

The Titan system also integrates with Pathfire via Sundance's Digital Delivery Management System (DDMS). Pathfire provides frame-accurate program timing information that is automatically applied to the media element, resulting in a fully segmented program without the manual labor normally required. ■

Design team

Roscor
- Steve Kazola
- Bob Strutzel
- Chad Theilen

Roberts Broadcasting
- Chris Meisch
- Michael Drainer
- Oma' O'Hara

Sundance Digital
- Kurt Caruthers, dir. of sales
- Eric Harrington, dir. of eng.
- Luis Munoz, broadcast sys. eng.

Technology at work

Grass Valley
- PVS1108 video file server
- PVS1022 video file servers
- PFR7146 raid controllers
- PFR5180 raid controllers
- Concerto router

Miranda Kaleido Alto AD

Pathfire content manager

Pinnacle
- Deko 1000
- Lightning 1000

Sundance Digital
- Titan automation
- InteliSat
- Mirror/DataMover

SQL data server

Quartz QMC MC switcher

Telestream FlipFactory transcoding and proxy generation

Broadcast Engineering 5th annual Excellence Awards

Category: *Station automation*
Submitted by: *Sundance Digital*

Twin Cities Public Television's

high channel count calls for powerful automation

Delivering seven distinct services to more than 2 million households requires a powerful infrastructure. So when Twin Cities Public Television (TPT) went from two analog channels to an SD/HD mix of seven program streams with five locally-programmed channels, engineering recognized the need for a serious automation, server and traffic upgrade.

The station is a duopoly with two licenses in a single market. It serves its audience with full-time HD programming and a rich mix of analog and multicast programming, including more than 100 locally-produced programs each year.

TPT's unusually high number of local channels demanded a master control overhaul to include a multi-faceted and expandable automation solution with enough flexibility and power to drive the equipment and systems associated with a five channel station. In April 2005, the facility went on-air with Sundance Digital's scalable Titan system comprising the heart of the configuration.

Titan can handle hundreds of channels in a single facility or manage channels at multiple remote locations. The station's new automation system controls two Omneon servers, one production and one broadcast, numerous tape machines, the facility's emergency alert system, switchers, branding equipment, character generators and audio carts for all five channels. It also includes a breakthrough level of integration between Myers ProTrack traffic software and Sundance Archive Manager (SAM). All of this is interfaced with Masstech's MassStore archive application storing to a Spectralogic 120-cassette archive with 10,000 hours capacity. The Titan configuration includes three Media Prep stations to handle the vast amount of content being ingested and reviewed, TitanSync for auto-failover redundancy and Intelli-Sat broadcast manager to schedule and record satellite feeds.

Titan wears many hats at the facility. In addition to its traditional role of driving playout devices, it seamlessly links with the ProTrack traffic software for heightened functionality and comprehensive exchange of data. The integration goes far beyond the traditional recordlist, playlist and as-run communication common to most traffic/automation system interfaces.

ProTrack also transmits metadata to Titan describing the nearly 100 interstitial promos, billboards and IDs to be created each week. Rather than a laborious process of editing to tape and ingesting from tape into the broadcast server, the editors simply export each batch of clips to the Telestream FlipFactory, which transcodes them into Omneon MPEG-2 format. Titan then matches each clip to metadata and alerts the operator to perform a quick quality check. The confirmed time for all ingested clips is instantly communicated back to ProTrack, insuring that the logged duration of each element is correct. This system has allowed the video promotions department to eliminate tape and redirect countless staff hours to more creative work.

With so many channels dependent on local content, system redundancy is critical. This is provided by a completely redundant Omneon server, driven by Sundance's TitanSync redundant playlist management. It remains synced to the primary Titan system and can take over at any time upon automation or operator command. In the event of archive system service or upgrades, another traffic/automation interface comes into play.

This combination of new technology supporting four SD and one HD local channels puts the TPT operation at the top of the industry. ■

Design team

Twin Cities Public Television
- Bruce Jacobs, chief technologist
- Tim Mortenson, op. mgr
- Scott Rivers, eng. mgr
- Jerry Gonerka, traffic specialist
- Don Heppelmann, automation
- Ken Hillstrom, server and archive specialist
- Mike Merrick, broadcast op. eng.

Sundance Digital
- Robert C. Johnson, president
- Kurt Caruthers, dir. of sales
- Eric Harrington, dir. of eng.
- Chad Hughes, proj. mgr
- Mike Lynch, broadcast sys.eng.
- Annie Billings, dir. of training

Technology at work

Sundance Digital
- Titan automation
- Intelli-Sat archive manager
- TitanSync

Telestream FlipFactory transcoding and proxy generation

Category: *Station automation*
Submitted by: *Microfirst Engineering*

WFSU-TV/DT's
automation streamlines operations

For years, WFSU-TV/DT, public television for North Florida and part of the communications group of Florida State University in Tallahassee, FL, had been haphazardly adding digital equipment to the existing analog plant.

With two successive federal grants, the station was able to convert most of the plant to digital, change to server-based recordings and add automation to better control the four-channel multicast it provides during the daytime.

In late 2003, the station received the first grant. It worked with Command, a broadcast TV reseller based in Clearwater, FL, to procure a video file server, a near-line network attached storage system (NAS), file conversion equipment, an archive management system and MicroFirst's Digital Automation System (DAS) to tie it all together.

WFSU was mostly analog even though much of the equipment also put out digital signals. With the addition of a digital SeaChange server and the impending demise of the analog channel, the station made the decision to switch completely over to digital.

With that in mind, the facility bought conversion equipment and expanded its existing Venus router. Additionally, a digital level from its Saturn switcher was routed to the digital transmitter and then converted to analog for the analog transmitter. Two other levels of the switcher drove two more channels in the station's multicast.

The staff at MicroFirst worked with the station to determine its needs. The MicroFirst DAS would soon control all aspects of the station's master control, including the SeaChange server, automatic archiving to a near-line NAS, multiple levels of both its

Saturn switcher and its Venus router, five DVCPro tape decks, five General Instruments' satellite receivers and integrated scheduling with the station's Meyers Pro-Trac traffic system. As a result, the automation has not only improved the facility's on-air appearance, but also streamlined and simplified operations.

MicroFirst manufactures its own processing hardware with an embedded OS along with a comprehensive automated failover system for all automation processing, schedule execution, machine control and database management. The station achieved 100 percent redundancy with just three single rack-unit boxes.

The MicroFirst staff was receptive to feedback for software development to better control the station's systems and allow operators increased flexibility. Overall, WFSU has had a successful conversion to the all-digital multichannel future. ■

Design team

WFSU
- Pat Keating, general mgr.
- Jim McDaniel, chief eng.
- Ray Chamberlain, asst. chief eng.
- Leo Barfield, staff eng.
- John Wilkey, staff eng.

MicroFirst Engineering
- John Scarpa, president
- John Beneat, EVP and CTO
- Jerry Berger, VP, GM
- George Teplansky, sales eng.

Technology at work

- Evertz conversion equipment
- General Instruments satellite receivers
- Grass Valley
  - Venus switchers
  - Saturn switchers
- Meyers Pro-Trac traffic system
- MicroFirst Digital Automation System (DAS)
- SeaChange
  - BMC Broadcast Media Cluster server
  - Broadcast MediaLibrary NAS

Broadcast Engineering 5th annual EXCELLENCE AWARDS

Category: *Station automation*
Submitted by: *Omneon Video Networks/Sundance Digital/SignaSys*

WGVU-TV

shifts to a server-based operation

WGVU-TV, a service of Grand Valley State University, is a PBS television station based in Grand Rapids, MI, that provides educational, informative and entertaining programs and events.

This fall, WGVU completed a transition of its broadcast operations from analog to digital. Systems integrator SignaSys was chosen by the facility to assist with design, integration and installation of new broadcast technologies in an upgraded master control room that would enable the station to meet the FCC digital mandate, improve overall efficiency of operations and leverage resources more fully.

In a shift to server-based operations, WGVU replaced the 15 tape machines that previously supplied material for playout with a new Omneon Spectrum media server system that supports both SD and HD workflows within the facility. The support system enables efficient ingest and accurate program transmission. And its open architecture allows the system to support a broad variety of third-party applications, including Sundance Digital's highly-scalable Titan automation solution and Pictron digital asset management.

The facility's Titan package includes the Sundance Archive Manager, which provides interface between the automation and archive systems, Program View to enable viewing of video server content from any desktop in the facility, MediaCacher for batch ingesting media from tape into the server, and Intelli-Sat to manage the satellite feed recording process.

The automation system controls the server and manages playout of four SD channels, which allows the facility to program streams that support its daytime instructional television service for area schools. Evening programming includes one HD channel and one SD 480I service. The SD service is designed for viewers with ATSC set-top boxes connected to NTSC television receivers and to provide a feed for WGVU's analog transmitter.

Local programming is an important part of the station's broadcasts. Maintaining the facility's assets is accomplished by a Pictron digital asset management system. The Pictron Media Gateway Suite automatically encodes and indexes video so that it is searchable and accessible to station staff via LAN and Internet. The software suite includes tools that segment video into meaningful, searchable clips by detecting video scene changes, analyzing audio and extracting text — all of which is indexed automatically. Pictron allows editors to find clips and create Avid-compatible edit decision lists for program creation.

The close integration of the server system, automation and Pictron systems allows the station's staff to focus on maintaining on-air channels rather than on moving things to air. A Miranda Technologies' Kaleido multi-image display processor allows the operator to switch from monitoring all streams in the broadcast signal to a single stream with just the push of a button. Miranda's I-Web allows WGVU to monitor processes in its distribution infrastructure including it's A/D conversion equipment. ■

Design team

SignaSys
- Steve Hoffmann, proj. mgr.
- Jim Borgioli, sr. proj. eng.
- Jim Baird, network systems eng.
- Scott Polzin, installation sup.

WGVU
- Bob Lumbert, dir. of eng.
- David Oliver, eng. supervisor

Technology at work

- Cisco networking
- Evertz sync generators
- Marshal monitors
- Miranda Technologies
  - Imagestores
  - Distribution amplifiers
  - I-Web
  - Kaliedo displays
  - Allegro streamers
- NVISION routing
- Omneon Spectrum media server
- Pictron Media Gateway Suite
- Raritan KVM
- Sony
  - HDCAM VTRs
  - Luma monitoring
- Spectralogic LTO3 digital library
- Sundance Digital
  - Archive Manager
  - Titan automation
  - Program View
- TANDBERG Television encoding
- Tektronix WFM
- Videotek VTM
- Wohler monitors

Category: *Station automation*
Submitted by: *Sundance Digital*

WISC-TV's new automation system is the core of a technology upgrade

On March 7, 2005, there were a lot of frayed nerves at WISC-TV in Madison, WI. The 50-year old facility was preparing to flashcut on March 8 from its old analog technical core to a new digital SDI infrastructure capable of handling multiple program streams. The station reaches nearly 30 counties in southern Wisconsin and extends into Illinois and Iowa. As the station evolves into the premier news source for the 21st century, it continually seeks to add improvements and enhancements to keep it at the top of its game.

The upgrade packed as much power as possible into a new master control with three tightly integrated key systems, including as much automation as the station could afford. Easily expandable and built to accommodate a mix of analog and digital, a four-channel, fully redundant Sundance Digital Titan automation solution is at the heart of the station's new technical core and currently operates two channels: a CBS affiliate as its primary stream and a UPN affiliate as a second service. The third channel is used as a utility and the fourth for live-to-tape productions, such as sports or public affairs programs with open promos and commercials inserted for future airing.

Sundance Digital's Titan allowed the station to stay flexible in its equipment choices. The automation system, capable of controlling hundreds of playout channels within a single facility or playlists at multiple remote locations, drives the second key element, an Omneon Spectrum media server system, which can accommodate the growing quantity of material for playout.

Because most of the station's content is delivered via satellite, WISC's automation package includes Sundance Digital's Intelli-Sat broadcast manager to schedule and record feeds at the station's complex satellite receive center. Intelli-Sat's schedule drives the RF matrix, tunes the receivers, aims the satellite dishes and records feeds directly into the server.

Telestream's FlipFactory, the third vital element of the new system, facilitates ingest of program, spot content and metadata. Integrating tightly with Titan, it transfers the material automatically from five edge servers located throughout the facility into the Omneon server and Titan's database with only point and click operator intervention. The Sundance Digital Delivery Management System (DDMS) serves as a single management point for staff to view all the material residing on the cache servers and select which clips are to be transferred.

In addition, Titan ingests the station's electronic playlist from Wide Orbit's traffic system, produces the on-air playlist with imbedded secondary events and inserts and triggers voiceovers through the 360 Digicart/E audio server. Automation macros switch the HD station on and off when there are HD feeds from the network and automatically insert graphic bugs over programming.

Titan is built to keep pace with the station's growth. As WISC acquires new program streams, it can easily add playlists to the automation system. It was that flexibility, along with Titan's ease of operation and adaptability to the station's specific needs that made the system so appealing. Training and debugging commenced long before March 8, which made for a much smoother transition to the new technical core. The station never lost any airtime.

The station, still in its digital infancy, is discovering new features of its three key systems and learning how to take advantage of them. It's a growing process ■

Design team

WISC-TV
- Leonard Charles, dir. of eng.
- Steve Paugh, proj. eng.
- Kevin Ruppert, eng. maint. sup.

Sundance Digital
- Robert C. Johnson, president
- Kurt Caruthers, dir. of sales
- Eric Harrington, dir. of eng.
- Chad Hughes, proj. mgr.
- Casey Thi, broadcast sys. eng.

Technology at work

360 Digicart/E audio server
Omneon Spectrum media server system
NVISION
- NV5128-MC MC switchers
- NV8256 digital routing system

Sundance Digital
- Titan automation
- Intelli-Sat broadcast manager
- Digital Delivery Management System (DDMS)

Telestream FlipFactory

WRJM-TV's digital automation system

WRJM-TV began operating with a UPN affiliation in 2000 in Montgomery, AL. As a new station in the market, it realized the need to be one step ahead of its competitors in all areas — most importantly in technology. After a great deal of research, the station chose Microfirst's digital automation system (DAS) to be the brains of its control room. Beginning small, with only one satellite dish and minimal broadcasting

per day, the station has now grown to a 24-hour facility that receives multiple satellite feeds, ingests content from multiple video and audio sources and requires multiple active schedules.

Two years after the station's inception, a search began to expand its operations, while also streamlining its operator interface.

After reviewing all of the available competitive automation systems, the station kept turning back to MicroFirst. The company explained that the system the station owned had been completely rewritten to include a host of new features and new user interface as well as a new real–time operating system that boots in less than 10 seconds, is impervious to viruses and worms and perfectly mates with the automation processing applications.

This system also operated on MicroFirst's own processing hardware, which has more than 100,000 units in use in the gaming industry. However, if this was not enough to convince the station to go with Microfirst, there was one constant thing that the station could not find anywhere else: service. It never failed that if an issue arose inside the station's control room, it would happen at the most inopportune time. Whenever there was an issue, the station would call service representatives at Microfirst, who would quickly walk the station engineers through the steps of correcting the issue and get the system back to running at 100 percent. Service representatives at Microfirst wouldn't redirect the station engineers to the technical support number, but instead quickly resolve the issues. This kind of service has been a reoccurring theme over the past years in the relationship between the station and Microfirst.

With the new system, WRJM wanted to become a fully automated station with the option to grow as its station grows. Among the station's needs were:

- to control multiple video servers
- simultaneous broadcast control of two stations
- the ability to remote control the system from any location
- ingesting from multiple satellite feeds
- the ability to add incremental components into its automation system.

After the facility ordered DAS, it received the new system within a few months and the Microfirst technician arrived ready to install. From there it was only a matter of hours before the transformation was complete and the station was up and running on the new DAS. The most impressive part of the transition was the fact that the facility did not stop broadcasting at all during the transfer. The two systems ran simultaneously until all connections were secured. Then it was only a matter of shutting down the old system.

The new system is logical in nature and just simply makes sense. The user interface is clean and uncluttered. The station's operators learned the new system in about 15 minutes. The system has yet to fail and the service has been truly exceptional. Microfirst has even pointed out features that the station has not been using in order to make the facility operate better. ■

Design team

WRJM
- Nicky Bull, general mgr.
- Matthew Simechak, eng. staff
- Boyd Mizell, eng. staff
- Matthew Wren, eng. staff
- Mike Fairfield, eng. staff
- Regina Kimbrell, MC staff
- Jeremy Snell, MC staff
- Matt Golden, MC staff
- Rodney Linebarger, MC staff
- Ray Wren, MC staff
- Steven Cox, MC staff

Microfirst Engineering
- John Scarpa, president
- John Beneat, EVP and CTO
- Jerry Berger, VP, GM
- George Teplansky, sales support eng.
- Rick Sondefan, sr. software eng.

Technology at work

MicroFirst Engineering
- MPC-1600 automation processor
- GPI 16x16 interface unit

Sony
- MAV 70 video file server
- VTRs

Videotek RS-103 routing switcher

Category: *Station automation*
Submitted by: *Crispin*

WSKG-TV's

traffic department successfully monitors master control

WSKG-TV is the public television station serving the Binghamton/Vestal, NY market. In order to continue delivering high-quality education services and programming, the facility pursued a digital transition. Several goals were in mind when beginning this project:

- create a digital infrastructure to support several program streams, as well as the eventual distribution of HD programming content
- create greater operational/staffing efficiencies
- create a digital archive to preserve our locally produced programming.

SignaSys was selected as the systems integrator on this project. The core system installed is a Crispin System 2000 automation system controlling an Omneon server and NVISION MC and routing switchers.

The new automation system gives the facility the flexibility needed to run multiple playlists in SD and can be dynamically reconfigured to run an HD playlist. A major feature of the System 2000 is Supervisory View, which provides a high-level view of automation functions.

Because WSKFG is a small-market television station, operational efficiencies and staffing flexibility are a must for survival. There are now several hours each day when master control monitoring becomes the responsibility of the traffic department. A video monitor on the traffic department wall displays the system's Supervisory View and enables the traffic staff to monitor and correct the on-air playlists for errors and exceptions. This high-level display provides only the needed status information for what is on the air. Audible and visual alerts are provided to notify traffic of any missing media or any exceptions requiring manual intervention. Because this display notifies them only when intervention is needed, the traffic staff is free to perform their regular duties while monitoring master control.

A second Supervisory View screen is also in the actual master control area. This enables master control technicians to also multitask while monitoring the on-air signal. A single operator can make dubs, do quality control checks and other tasks while monitoring multiple on-air playlists. It also notifies them only when intervention is required.

There are also multiple ingest workstations in the facility running Crispin's Dubber software. In the past, all programs were dubbed to tape then delivered to master control for dubbing into the on-air server. This created a huge workload, as well as a bottleneck in master control. Now, locally-produced programming is ingested into the on-air server right from the edit room. This eliminates a large portion of the workload and increases on-air quality by eliminating generational loss in the tape dubbing process.

The heart of the automation system is Crispin's AssetBase, which resides on a Web server within the facility. Any authorized operator can access this database to manage programming, inventory and satellite feeds — again freeing up a bottleneck in master control. In the past, all this information was placed on paper and then delivered to master control to be manually entered.

Crispin's ArchiveManager application creates a digital archive of locally produced programming. WSKG has been producing local documentaries since its inception in 1968. Its library now includes rare historical footage of upstate New York.

ArchiveManager does not require middleware to manage the actual archive volumes. This is not only a tremendous cost savings, but it simplifies the management and maintenance of the system.

Crispin's applications helped streamline WSKG's operations, improve its on-air presentation and enhance its brand. ■

Design team

Crispin
Rodney Mood, CTO
Jim Zagrobelny, VP of software dev.
Tom Kingsley, chief sales eng.
Bob Valinski, dir. of bus. dev.
SignaSys
Jeff Johnston, proj. mgr.
WSKG
Peter Bombar, former chief eng.

Technology at work

Crispin System 2000
Omneon servers
NVISION routers

Broadcast Engineering 5th annual EXCELLENCE AWARDS

Category: *Network automation*
Submitted by: *VertigoXmedia*

ARGENT
automates efficiently

Le Groupe TVA, a privately run French broadcaster in Canada, recently launched a 24-hour channel, ARGENT, which delivers financial news in French. With the costs involved in designing a new facility and supporting a start-up channel, it was important that the station be able to operate on minimal resources. Because its programming would focus solely on financial news, ARGENT had to capture an audience large enough to sustain itself in such a limited market. Finding creative ways to cost-effectively produce eye-catching, timely programming was a key part in the design of the facility.

While ARGENT's engineering team had a good deal of flexibility in setting up the facility, there were a few guidelines. Because Le Groupe TVA's other stations already relied on Avid editing and newsroom systems, it was

imperative that the new facility be compatible with these technologies. And because staff would be held to a minimum, all of the equipment installed in the new facility needed to be user-friendly. Finally, because graphics are a key element to illustrating financial news, the new facility needed to be able to support a heavy load of tickers and graphics production and playout.

ARGENT chose Applied Electronics to assist with the design of the new facility. A variety of equipment was selected to handle the development and playout of news, including Grass Valley's audio/video routing switchers, an Ikegami HC-250 camera, a Miranda Oxtel-series Imagestore and an Avid NewsCutter editing system. VertigoXmedia's Xmedia Suite and VertigoXG graphics systems fully automate the generation and play out of graphics.

The integration of the new technology, as well as links to live data sources from Bloomberg and Reuters, allows ARGENT to automatically populate and play out full-screen financial boards, charts, crawls and L-bars, in addition to news and two stock tickers. This amount of live data on-air would not be possible without a templated approach to graphics. The financial boards and charts are used in conjunction with produced shows, such as business and market discussions, consumer financial reports and stock market analysis. The integrated technologies have made it easy for the facility to quickly create the large number of charts and graphics required to support such a wide variety of programming.

In addition, the Xmedia Suite allows journalists, anchors, line-up editors and producers to create a chart or graphic without a graphic artist.

This has been key to the facility's success because it operates with only five technicians and 11 editorial department staff members.

Since launching in February of 2005, ARGENT has already captured the same monthly reach that established Quebec business magazines enjoy. ■

Design team

Applied Electronics
- Yvon Cardinal, systems integrator

ARGENT
- Eric Lemire, proj. dir.
- Jean Veillette, proj. mgr.
- Bernard Rouette, proj. mgr.

Technology at work

- Avid
  - NewsCutter
  - Unity
  - iNews newsroom system
- Evertz MVP multi-image display processor
- Grass Valley
  - Kalypso video switcher
  - Trinix and Concerto 256x256 audio/video routing switchers
- Ikegami HC-250 camera
- Miranda Oxtel-series ImageStore
- Soundtracs DS-00 audio console
- VertigoXmedia
  - Xmedia Suite graphics automation
  - VertigoXG graphics systems
- Vinten HS-102 pan and tilt robot head

Category: *Network automation*
Submitted by: *Harris/Leitch/Inscriber*

CBC-TV
integrates on-air branding

As a Canadian national broadcaster, CBC-TV required an efficient, powerful and flexible graphics solution to address its on-air branding needs and to integrate with its current infrastructure. It needed to trigger branding elements on different areas of the screen for different regions of the country.

The broadcaster also wanted more sophisticated graphics that did not have to be manually loaded — a tedious and error-prone process. It needed a solution that provided the graphics capabilities, coordination and playout for template-intensive programming such as news, sports broadcasts or other live events.

CBC/Radio-Canada, Canada's national public broadcaster, invested in 20 SD and two HD Inscriber Inca AutoCG graphic playout systems for all network and regional branding.

CBC transmits its broadcast from the network control center (NCC) in the Toronto broadcast center. To accommodate time zones and local program variation, 19 SD program channels are currently used along with two HD channels.

The Inca AutoCG system offers the broadcaster a central graphics playout system that provides the combined functionality of a still store, CG and clip player. The rich SD or HD output of the systems can operate under control of industry-standard automation systems or MOS-enabled environments.

Each of 19 channels requires its own branding elements. A single-channel CG system is assigned to each channel and controlled by the NCC automation system. To simultaneously display multiple elements, such as a logo, a rating key, a weather alert or an animated tab showing upcoming events, the CG has two control ports, each controlled as a separate device from the automation.

To achieve sophisticated branding, the broadcaster chose the Strata layering functionality option of the graphics system. This allows the creation of multiple channel effects on a single channel. By using the layering functionality, two separate instances of the graphics application are running, each receiving its control input from the automation and rendering to the same physical output channel and mixing its graphics elements to the program video.

Several types of graphics elements are used. There are static and animated logos that are rarely updated and elements that change daily. These include animated tabs with messages such as "coming up next ..." Last-minute items such as crawls are also handled by this system and can be delivered to air via automation or manually.

The broadcaster's workflow involves a department creating the daily tabs and loading them into two server PCs. One PC continually updates all of the branding machines with the latest changes, while the second machine is synchronized to the first and acts as a standby in case the first PC fails.

Because the PCs double as offline CG workstations, any NCC operator can log into Inscriber Inca Studio to make last-minute changes, create crawls or verify the material.

CBC initially installed one system into one of its channels to resolve any issues related to integrating with its busy on-air automation, before proceeding with the rollout to the remaining channels.

In expanding its services, the broadcaster also implemented two HD channels as part of the NCC network delivery. Two Inscriber AutoCG machines were integrated into the branding delivery system to display the branding elements in HD format seamlessly to those channels.

Working with the Inscriber solutions, CBC realized a greater level of sophisticated graphics for improved on-air branding and integration with its automation system. ■

Design team

Harris
- Alex Wackley
- Jeff Rehling
- Wayne Weaver
- Julian Ivanov

Manfred Weitzmann CBC integration team

Technology at work

Inscriber AutoCG SD and HD systems
Grass Valley automation
Leitch
- Digital DAs
- Closed-captioning equipment

Sony routing switcher

Category: *Network automation*
Entry submitted by: *Omneon Video Networks/Pro-Bel*

TV Guide Channel's

new automation and master control facility

TV Guide Channel provides nearly 80 million homes in 27,000 different localities with comprehensive program listings and original programming. With its rapid growth, the channel has expanded its programming services, adding more live content and highlighting VOD and HD programming in its program listings.

To accommodate its increasingly sophisticated production and playout needs, the network selected Omneon Spectrum media servers and Pro-Bel automation for a more flexible transmission infrastructure for its transmission center in Tulsa, OK. The first phase in this project, completed successfully in May 2005, involved installation of a new automation and master control facility.

In overhauling its transmission operations, TV Guide Channel sought to move towards a dynamic and flexible output. To this end, the network integrated Pro-Bel's Aurora control system, Sirius multiformat routing for audio and video, TX Series master control and Morpheus automation with Omneon Spectrum media servers, as well as existing Pinnacle DekoCast graphics and branding systems.

Morpheus gives operators at the facility's transmission center the ability to schedule down into the details of playout. The automation solution allows operators to discretely schedule individual graphics without preauthoring, which offers greater flexibility in presentation styles.

The Sirius and Morpheus systems respond to and react along with the operator, providing cut-in capabilities within master control and allowing users to switch, brand and change content as necessary.

In addition to updating transmission operations, the facility also streamlined the workflow between production and playout. The facility's production center is located in Los Angeles, CA. Material is produced there using nonlinear edit systems. Finished sequences are then transferred to the Omneon media servers in the Oklahoma transmission center over fiber, transcoded by Telestream's FlipFactory software. This IP transfer allows TV Guide Channel to maximize the use of both facilities while enabling the greatest flexibility.

As the facility delivers a growing amount of media to more consumers via television and other platforms, network staff will have the tools to efficiently move content around the primary pictures and sound. In addition to simplifying presentation of clever graphics, the new playout system also supports transmission of additional digital data for digital broadcast. As content is distributed to such platforms as mobile phone networks and IPTV, the automated master control will simplify many playout operations too complex and unwieldy to be handled manually.

Operating from its new master control system, TV Guide Channel is able to handle current transmission operations more efficiently and, in the future, to expand to different delivery channels while maintaining its existing staff and infrastructure. ■

Design team

TV Guide Channel
- Lawson Adams, eng.
- Jack Carey, SVP op. eng.

Pro-Bel
- Neil Maycock, CTO
- Dave Collins, head of automation group
- Richard Harlan, Morpheus team leader

Technology at work

Omneon Spectrum media servers
Pinnacle DekoCast graphics
Pro-Bel
- Aurora control system
- Morpheus automation
- Sirius multiformat routing for audio and video
- TX Series MC switcher

Category: *Newsroom technology*
Submitted by: *Ross Video*

A-Channel
improves workflow

CHUM Television's A-Channel in Barrie, Ontario, decided it was time to replace its aging Ampex analog production switcher. One of the design goals was to improve workflow within the control room while enhancing the station's news product. The news production staff in Barrie also function as the ENG crew. To enhance the value of the station's news content, this staff needed to spend more time on location and less time in the control room.

In 2003, CHUM's engineering team began investigating new technologies in control room design and workflow. It discovered emerging technology in production control automation. Unfortunately, the product offerings at that time did not provide the facility the flexibility to manage the significant number of incoming feeds it used, up to seven feeds during any newscast. Also, the existing automation solutions only worked in a tapeless environment, and the station was tape-based, and new servers were not in the budget.

In 2004 Ross Video launched the OverDrive production control system, which was selected for the new facility. OverDrive is a Windows-based control system that allows live news production to be run manually, semi-automated or fully-automated at any time. It also provides an MOS *LiveLink* to the Avid iNews rundown, allowing for instantaneous rundown changes to be reflected from the newsroom to the production control system. It also integrated easily with A-Channel's Ross Synergy digital production switcher.

To process the large number of external remote feeds, the facility chose a Leitch NEO system for frame synchronization. NEO allows the production staff to monitor and perform on-the-fly quality control adjustments on 18 external feeds simultaneously. The OverDrive system manages audio level adjustments for live quick hits from the field. The combination of these technologies enhances the facility's ability to produce more high-quality content in the field.

In addition to the many technical achievements on this project, there were two significant logistical hurdles to overcome. First, unlike most new production control rooms, which are designed to be compact and minimalist, the A-Channel control room was built to be both a production and shooting environment. To accommodate this flexibility, the new facility was designed with professional studio lighting, good acoustical quality and well-thought-out camera positions. This design allows the facility to produce news that is consistent in look with all CHUM productions across Canada.

The second major challenge was the complete re-branding of the station, including new graphics, promos and set design. Despite the initial challenges, the cooperation among internal and parent company staff along with a professional partnership with many key vendors ensured a successful completion of the project. ■

Design team

CHUM Television
- Bruce Cowan, dir. broadcast tech.
- Lane Steinhauer, mgr broadcast eng.
- Debbie Greg, eng. technologist

A-Channel
- Brian Cathline, mgr. of tech.
- Kirk MacGregor, mgr. live operations

Ross Video
- Brad Rochon, OverDrive product mgr.

Technology at work

360 Systems Image Server 2000
Avid iNews control system
Leitch NEO frame synchronizers
Pinnacle Deko 3000 CG
Ross Video
- OverDrive production control system
- Synergy 3 SD digital production switcher
- Kondor routing switcher
- RossGear digital and analog conversion and distribution equipment

RTS Adam intercom system
Yamaha 02R96 audio consoles

France3

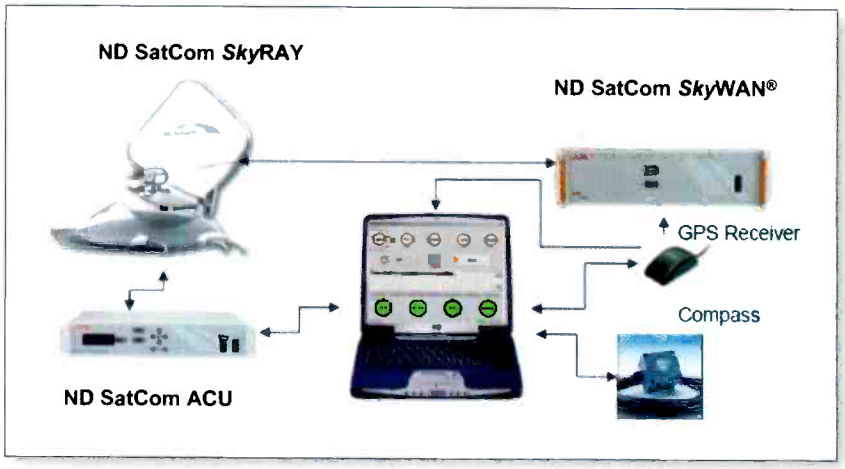
implements antenna Automatic Pointing System

Globecast is a French service provider supporting broadcast customers with equipment and capacity for news contribution. One of the company's customers is France3, a large TV channel in France.

Nobody is as driven by the speed to deliver news and to forward that news to studios and consumers as are broadcasters. Each minute counts, and the value of the news vanishes as time goes by, unused. On the other side, personnel resources are scarce and expensive. The crews consist mainly of reporters and not specialized technicians.

ND SatCom took the challenge to simplify the handling of the SNG to a degree that a non-technical person can operate it. In the past, the satellite transmission equipment was handled by experts, and an important part of this is the correct and reliable pointing of the antenna. Now, a France3 reporter can push one button and the system will automatically point the antenna to the satellite, all within a few minutes. Time-to-air is faster. The SNG link logs automatically into a management network, and the reporter is ready to transmit.

Globecast and the France3 reporters are pleased about this ease of use. Globecast saves significant operational costs, especially because the system needs no pilot signal, which saves on satellite costs every month.



A particular problem was the satellite operator's demand for high pointing accuracy to avoid interference with other services. Polarization angle was also critical. Globecast demanded that the system not only calculate this angle, but contain an automatic process for its optimization. The presence of other strong signals on the satellite was a severe problem that was solved by a further improvement of the algorithm.

ND SatCom markets the system worldwide. So the approach to use "known" reference satellites was not acceptable, because it constrains the automatic use. The pointing system needs only the position of the target satellite and can work everywhere. In fact, it uses the network's internal data to determine that it has reached the correct satellite and the correct network. The automatic pointing creates no overhead and creates no interference. Immediately, when the France3 reporter gets confirmation that the "antenna is pointed," the system is allowed to begin transmission, without further network management or user involvement required.

The solution is a true automatic antenna pointing system for *Sky*WAN media networks. Globecast and France3 users appreciate the ease of the process, even for non-expert users. Users also benefit from the saving on investment and recurring costs. As a side effect, the reporters enjoy office communication via the network, which acts like an Internet or Intranet. ■

Design team

France 3
Alain Danré
Globecast
Dominique Orain
ND SatCom
Christian Hauff
Siegbert Weingärtner
Thorsten Hempel

Technology at work

ND SatCom
SkyRAY car mountable antenna system
*Sky*WAN contribution, exchange and management satellite network system

KTBC-TV
invests in an SNG/ENG truck

KTBC-TV in Austin, TX, called on Shook Mobile Technologies to build its first satellite newsgathering and uplink truck.

The station's design criteria called for reliability in a cost-effective and user-friendly truck. The station also requested that the truck be built on a Mercedes-Benz designed Freightliner Sprinter 3500 high-roof chassis. The new truck's high-quality transmission capability proved valuable in providing local and national FOX viewers with footage of both Hurricane Katrina and Rita.

The raised-roof van fits three operators and requires no special parking permits or driving capabilities. It can maneuver easily into narrow spaces in the city. It also provides twice the

gas mileage typical of a combination satellite/uplink truck and features an on-board diesel generator.

The truck also features an attractive ergonomic interior. The passenger seat swivels to allow an operator comfortable access to the production area. Scopus Video Networks' E-1720 digital satellite newsgathering (DSNG) encoder — a compact, lightweight and power-efficient system with integrated telemetry — simplifies operation so that reporters can manage operation without the assistance of an SNG operator. With the L-band output and MPEG-2 codec, it provides double-duty in enabling transmission of audio and video converted for 4:2:0 or 4:2:2 satellite transmission.

Live video and audio acquired by the shooter can be combined with pre-recorded data directly into the MPEG-2 encoder provided by Scopus, which encodes a baseband video signal to a compressed signal. It also allows the compressed signal to be QPSK modulated and converted to an L-band output delivered directly to the Paradise Data Systems 125-W solid-state power amplifier with an integral block upconverter.

The solid-state transmitter is mounted on the truck's 1.2m Vertex antenna with automatic satellite location capability, a GPS-controlled system that makes it easy for the truck operators/journalists to set up quickly once they're on site.

Equipped with an MRC microwave system, fitted to a 56ft mast, the new van is a dual-function truck. Operators can use digital terrestrial microwave link if they're close enough to the receiver with a clear line of sight. If not, they can transmit via satellite. An Ikegami remote mast camera is also fitted to the mast to get shots that would otherwise be difficult.

The unit uses Leitch terminal equipment, a full two-channel IFB system by Studio Technology and an RTS intercom system. KTBC supplied a Panasonic P2 NLE and P2 field camera system. Audio is handled by a Mackie rack-mount 16-channel audio system. The unit's Willbert D-Tech comprehensive mast safety package warns

operators if the unit gets too close to high-power lines or other dangerous high-voltage sources. ■

Design team

Shook Mobile Technologies
- Ron Crockett, president, dir. sales and marketing
- Tony Raven, vp, dir. of eng.
- Jack Feldman, field sales eng.

KTBC
- Danny Baker, vp, general mgr.
- Ken Smith, vp of eng.
- Gene Kirby, chief eng.

Technology at work

- Ikegami Mast camera
- Leitch terminal equipment
- Mackie 16-channel audio system
- Mercedes-Benz Freightliner Sprinter 9900 lb GVWR chassis
- MRC microwave system
- Panasonic P2 NLE and P2 camera
- Paradise Datacom solid-state 125W transmitter with L-band BUC
- RTS intercom system
- Scopus Video Networks E-1720 DSNG encoder
- Studio Technology 2-channel 16-channel audio mixer
- Vertex 1.2M SMK antenna
- Willbert D-Tech comprehensive mast safety package

Category: *Newsroom technology*
Submitted by: *Leitch*

SBT's
complete transformation to digital

When Sistema Brasileiro de Televisão (SBT), Brazil's national television network, set out to design a news production facility, the network's goal was straightforward: build a facility that would facilitate the integration of content acquisition, contribution and newsroom technologies; create an end-to-end digital infrastructure; and provide journalists and operators with a wide gamut of tools for their workflow requirements (from ingest through playout).

The new Leitch system at SBT replaces an existing Digital S tape environment. The system design consists of a NEXIO server newsroom system that includes five NEXIO transmission servers; six NEXIO NewsFlash FX editing systems with approximately 300 hours (at 50Mb/s I-Frame) of high-res storage in a fully mirrored configuration; and two VelocityQ multi-stream, NLEs. The low-res portion of the system consists of 10 NewsFlash Preditor viewing and editing clients seats, along with 120 AP/ENPS client seats. The new facility features a central ingest point, six edit suites, a newsroom complex and a production control room for news play-to-air.

Systems integrator Brasvideo was charged with the system design and installation of the facility. The installation was a major upgrade — a complete transition to digital — and involved a total transformation of the operations that had been in place for many years.

On a typical day in the new facility, as material is being ingested from satellite or remote feeds into the server system via Leitch's Ingest Control Manager, a low-res frame-accurate proxy is created simultaneously. The proxy copy can be viewed and edited by journalists; voiceovers can be recorded and inserted; stories approved and inserted into a MOS-active rundown; and high-res, edited originals can automatically be conformed. Proxy-based, edited content is created faster than real time for rapid playout on the high-res server, or the content can be sent on for further editing, including the addition of dissolves, wipes, and 2-D and 3-D effects by the NewsFlash. All of this is done directly on the journalists' desktop workstations. In addition, Leitch's Rundown Manager provides active MOS status and connectivity to the MOS-enabled AP/ENPS newsroom computer for play-to-air.

SBT also uses AP's SnapFeed for content contribution from international correspondence. The material is sent via the Internet, converted by the VelocityQ NLEs and sent to the NEXIO server system via LAN FTP.

The news production facility also includes Leitch's CCS Navigator and Pilot control software; NEXIO Remote and Pilot applications; 6800 plus modular series products; an X75 SD multiple-path converter/synchronizer for video processing; an Integrator 32x32 serial digital video routing switcher; SuiteView multi-image display processor; and Videotek serial digital/analog multiformat on-screen monitors and signal monitors. ■

Design team

Brasvideo
- Wagner Mancz, managing dir. sales and marketing
- Martin Bonato, managing dir. sales and tech.
- Luis Ricardo Bernardoni, managing dir. customer support
- Eduardo Mancz, customer support and service
- Rubens Ortiz, mgr. of sales and tech.

SBT
- Roberto Franco, dir. of eng.
- Cicero Marques, eng. mgr.

Leitch
- Edel Garcia, VP of sales

Technology at work

Leitch
- NEXIO server newsroom
- Ingest control manager
- Rundown manager
- CCS-Navigator
- NewsFlash Preditor low-resolution editors
- 6800+ Series modular platform

WFTV's technology advances enable mobile news

WFTV in central Florida is fueled by its innovative use of technology where news actually happens — in the field. The station has maximized its use of digital newsgathering tools to create a competitive advantage. Its reporters and photographers shoot stories in the field with Panasonic P2 cameras and edit with the Avid NewsCutter XP software on laptops.

Working in a digital world allows the station's crews to spend more time at the scene gathering the latest information and less time cutting with videotape. Crews shoot and edit on the frontlines without using a live truck or returning to the studio to edit. By using this mobile workflow, the station gains a competitive advantage — getting late-breaking stories to air first.

In the fall of 2005, WFTV's in-the-field workflow passed a big test on an important story of national interest.

The station's reporter Steve Barrett and photographer Corey Reppenhagen flew aboard an NOAA hurricane hunter plane into the eye of Hurricane Ophelia. Reppenhagen captured compelling images using a Sony HDV camera, while Barrett captured and downconverted awe-inspiring HD footage via firewire into his laptop and used Avid NewsCutter XP software. While still flying in the center of the hurricane, Barrett and Reppenhagen edited the story. As soon as the plane landed, they transmitted the finished story. The HD footage will be used in an upcoming hurricane special in June of 2006.

WFTV's crews in the field are also supported by newsroom staff using an Avid Unity shared media network with NewsCutter XP, NewsCutter Adrenaline and the latest Avid desktop story composition tool, Avid iNEWS Instinct. Instinct presents a simple interface for writing content, editing video and transmitting it for air from a single program.

The combination of Panasonic's tapeless P2 cameras and the station's Avid digital workflow makes it easier for producers to use the latest and best-quality video in their newscasts. Additionally, WFTV uses six Avid AirSpeed systems for direct ingest; 20 Avid NewsCutter XPs and three NewsCutter Adrenaline FX systems for news and promotion editing; two Avid AirSPACE video servers for mirroring and playout; and an Avid Unity for News shared media system.

WFTV continues to evolve and improve its digital nonlinear workflow to take advantage of efficiencies brought about by new technology. ■

Design team

John Demshock, chief eng.
Bob Jordan, news dir.
Chip Reif, eng. mgr.
Michael Vivona, eng. supervisor
Bryce Layman, op. mgr.
Dave Sirak, news op. mgr.
Bruce Wiley, proj. coord.

Technology at work

Avid
- iNEWS Instinct
- NewsCutter Adrenaline XP
- editors
- Unity for News media network

Panasonic P2 cameras
Sony HDV cameras

Category: *Newsroom technology*
Submitted by: *Crispin*

WWBT-TV

archives news footage with NewsCat

As WWBT's facility moved to a tapeless workflow with nonlinear editors and video servers, it was important to have an archive system in place to store news stories without the time consuming process of dubbing to videotape. The facility began researching news archive solutions in early 2005. It was looking for a scalable product that met its workflow requirements and budget. In October, the facility became a beta site for Crispin's NewsCat application — an affordable, integrated news cataloging and archive solution.

WWBT had a number of reasons for choosing the Crispin news archive solution. The facility wanted to complete the tapeless workflow and eliminate the need for VTRs in its edit rooms, especially with its conversion to Panasonic P2 looming. It was also running out of real estate for its tape library. All of the facility's hallways are lined with shelves containing 35 years' worth of news tapes. NewsCat gave the station a return on investment almost immediately. It was able to save money by eliminating tapes from the equation.

The entire NewsCat archive system occupies nine rack units. This includes the database and Web server, low-resolution encoder and RAID storage.

NewsCat makes an archive copy of each clip on the Profile after airing, based on the rundown. Most important, it provides a method to easily locate material at a later date. Archived video clips are linked to a database containing all script information from the facility's QNews newsroom computer system. The database functionality includes an extensive search function. Producers and editors can search for a story using traditional parameters, such as date, slug, script information, CG text or keywords. Low-resolution proxies are created for each archived clip, enabling journalists to preview material on their desktops before restoring to the edit room.

The facility can also create a library of generic file video by annotating news footage with keywords and descriptions. And since it's a browser-enabled system, all of the facility's producers can simultaneously access archived video clips using a standard Web browser from anywhere on the network. This browser-based system eliminates the need for dedicated archive terminals or software that not only enhances the workflow, but makes it easier to maintain the system.

WWBT designed its video storage solution to enable retrieval of up to 24 months of the most recent news video almost instantly using nearline storage. Older material is permanently stored in digital file format on removable Sony PDD disks, which are tracked by the NewsCat database. These disks can hold up to 23.3GB of data, which is more than three days' worth of news stories, allowing the facility to significantly reduce the amount of shelf space it dedicates to tape libraries. Storage space requirements for these disks will be approximately 70 percent less compared with archiving on DVCPRO tapes.

The Crispin NewsCat system has made it easier for WWBT to enhance quality by keeping everything in digital file format, as well as making it easier for the news department to manage and find archived stories. The cost savings over tape archives was just a side benefit. ■

Design team

Crispin
- Rodney Mood, CTO
- Jim Zagrobelny, VP software dev.
- Dan Lah, sr. software eng.
- Tom Kingsley, chief sales eng.
- Bob Valinski, dir. of business dev.

WWBT
- Bruce Tinoco, dir. eng.
- Henry Boze, VP eng. TV
- R. Keith King, IT admin.

Technology at work

Autocue QNews newsroom
Crispin NewsCat system
Grass Valley
- 7 NewsEdit systems
- Profile server for news playback

The Ant Farm
expands its routing system

Running 24 hours a day, seven days a week means any downtime can be costly. Reliability is paramount when serving Hollywood's biggest studios. At The Ant Farm, an advertising post-production facility, Sierra Video routers handle hundreds of video and data routes flawlessly every day.

The Ant Farm creates and produces advertisements for feature films, TV programs and video games using a variety of media formats. The company's client roster features all of the major motion picture studios, including all of the print and editorial production for the blockbuster film trilogy, "Lord of the Rings."

Since its inception in 1998, The Ant Farm has grown both in business and technology. When it opened a new 36,000sq-ft facility in Los Angeles in 2003, the company chose a Sierra Video Tahoe system with a nine-level router, allowing room for expansion.

Within a year, the facility actually outgrew the routing system. It had originally chose Sierra Video products because of their reliability and a price point that fit The Ant Farm's budget. The facility hadn't experienced a single moment of downtime from any of the equipment, so when it was time to upgrade, it had confidence in Sierra Video's capabilities.

Because of the Sierra Video trade-up program, the upgrade was easy. The Ant Farm received a credit for its existing equipment when it traded the equipment in for a higher-level system. With the help of the Sierra Video team and the local broadcast integration specialists at Mason Engineering, the facility upgraded to the larger Yosemite Series routing system, which provides both analog and digital solutions from 32x32 to 128x256. The routing switchers support the more than 50 Avid editing suites in use 24 hours a day.

The Ant Farm realized that a single hour of downtime could mean the loss of thousands of dollars for its business, so it was important to make a smooth transition that did not interfere with the production schedule. Together, Sierra Video, Mason Engineering and The Ant Farm used a systematic approach over a four-week period to test, reconfigure and upgrade a new system without any loss of time.

This upgrade allowed the technicians to use the same control panels. For the technicians, there were no operational changes — everything just happened to be running through a bigger router.

To ensure a glitch-free installation, all the hardware was bench tested prior to shipping. Mason Engineering installed seven audio/video frames to handle composite video, digital video, analog audio, time code and RS-422 machine control, pre-wiring all the levels of the new router through new patch bays. A complex audio layer is also wired through patch bays to the routers. In addition, the system includes two SCP-240 programmable control panels, which offer system flexibility and functionality.

With more room for future growth and the confidence of the trade-up program, The Ant Farm continues to create ads for the next movie blockbusters and hit TV shows. ■

Design team

Mason Engineering
Ron Mason, co-owner
The Ant Farm
Craig Frieman, systems eng.

Technology at work

Sierra Video routing
Dual CPU frame, 128x128 video
Yosemite 128x128 audio
Yosemite 128x128 audio
Yosemite 64x64 audio
Yosemite 64x64 audio
Yosemite 32x32 AES
SCP-240 control panel

Broadcast Engineering 5th annual EXCELLENCE AWARDS

Category: *Post & network production facilities*
Submitted by: *Silicon Graphics (SGI)*

CIRIS'

MXF-based digital production environment

With post-production facilities in Amsterdam and Hilversum, CIRIS provides audio and video facilities in the Netherlands. The company decided to transition to digital workflows to speed production, offer media asset management services and support the MXF format. Many of the public and commercial broadcasters CIRIS works with are in the process of migrating to MXF-based production and transmission processes. The facility required an integrated storage and server solution to enable internal and external customers to store, search, browse and access video data and other content.

The facility also wanted digital workflows that would easily integrate with several different editing and transmission interfaces. Storage scalability was equally important. The services of the CIRIS Dynamic Platform, as the project is named, are offered to a heterogeneous group of customers, each having specific workflow requirements. These customers include public broadcasters, commercial broadcasters and nonbroadcasters with large product video libraries. As a result, the solution needed to be flexible and generic while also being capable of addressing specific customer demands. Silicon Graphics (SGI) Broadcast Europe designed, installed and integrated a complete digital storage and post-production environment for CIRIS.

The first phase of the project implemented the server and storage infrastructure and an asset management system. CIRIS purchased a 30TB SGI InfiniteStorage TP9300S storage array with a 6GB SGI Altix 350 server running Linux. The system includes four Intel Itanium 2 processors and a six-channel SGI media server with an InfiniteStorage array. A Sony PetaSite system is connected to the TP9300S array, allowing CIRIS to scale to 1.5PB of storage capacity.

Ardendo provided its ARDOME media asset management solution and helped the team with custom integration and development. ARDOME uses standard IT technology to enable television program and news producers to pre-edit on the Internet using Ardendo's EasyCut proxy editing system. The company also provided its ingest solutions ARDCAP and DART.

Transmission of the three Dutch public channels is done centrally. The platform uses MXF as a file format for exchanging content between applications and devices from different vendors. When customers are connected to the platform, specific MXF-based workflows are designed and implemented to support specific requirements.

Content produced outside CIRIS can be tape or can be sent directly from the customer as an MXF file using a network connection; all Dutch broadcasters are connected via high bandwidth network.

Content is stored on various devices, from high-speed disks to low-cost data tape, in high-resolution format and transcoded to low-resolution browse format. The low-resolution format, in combination with the asset management system, is used for searching and browsing at the facility or the customer location. The finished program can be transferred in the MXF format from CIRIS to the transmission location. ■

Design team

CIRIS
- Phillip Maher, tech. mgr.
- Piet Sjoukes, Dynamic Platform sales mgr.
- Hans Blom, sales mgr.

Silicon Graphics
- Kees Vos, architect, proj. mgr.
- Winfred van Kuijk, broadcast consultant
- Robert Pronk, account mgr.

Technology at work

Apple
- Final Cut Pro NLEs
- XSAN

Ardendo
- ARDOME MAM
- ARDCAP
- DART and ArdUpload ingest
- PreCut and EasyCut proxy editing solutions

Avid Unity
Front Porch Digital DIVArchive
InfiniteStorage TP9300S
Pinnacle Liquid Edition NLEs
SGI Altix 350 server
Sony PetaSite tape archive

Category: *Post & network production facilities*
Submitted by: *Solid State Logic/Ascent Media Systems & Technology Services*

Food Network
serves up digital production

Suitably located above the bustling Chelsea Market on the west side of Manhattan, Food Network's corporate and production facility represents a leap forward from its previous locations.

With the move to its new facility, Food Network consolidated what had been separate office and production sites. The two primary objectives: to build a facility that would allow the network's continued growth of successful new programs, such as "Iron Chef America" and "Food Network

Star" and to upgrade to a fully digital facility that could seamlessly transition to HD.

The design and installation was a joint effort by Ascent Media, HLW and Scripps Productions. The initial challenge was to create a contemporary production environment within the raw space of a century-old building, including two production studios; two production control rooms; edit, graphics and audio post rooms; and technical support facilities. Steel girders had to be tied between the walls on each side of the building and elevated above the existing flooring. The infrastructure had to be deemed structurally sound and safe before the project began.

Another objective for the new facility was to build a kitchen that would showcase the network to visitors while also serving as a fully functioning studio. The kitchen was fully wired for audio and video and lighting was tied into the dimmer system. As a result, the kitchen/broadcast facility supplements the 7000sq-ft main studio for a myriad of productions.

Nine Grass Valley LDK5000 HD upgradeable cameras — four mounted on pedestals, three mounted on jibs and two handheld — support the complex that also includes a smaller 2000sq ft studio. Significant attention was paid to the microphone distribution system due to the number of shows with live audiences and multiple band mixes. Last summer, the "Food Network Star" finale was shot live in the kitchen.

The audio control room is based on a Solid State Logic C100 digital broadcast console. It replaces the analog console at the Food Network's previous facility and allows vastly enhanced flexibility and speed. It addresses all of the production department's needs, including the ability to create and store recallable setups and to allow different EQ settings and dynamics processing for individual actors to be quickly called and recalled.

The facility's production team also liked the C100 for its ability to route virtually any signal through the entire console and, importantly, the 5.1-channel surround-sound mixing capabilities it provided.

The heart of the production control room is a Grass Valley Kalypso digital production switcher supported by a Pinnacle Deko character generator.

Because most of the equipment was new, training was critical. Ascent Media coordinated a training period

with all the major manufacturers that spanned four weeks.

Food Network is now undergoing the HD upgrade. The facility's post-production division is expected to be fully HD-capable by 2007, with the studio to follow by 2009. ■

Design team

Ascent Media
- Ricky Bonstein, VP of op.
- David Linick, proj. mgr.
- John Ciulla, design eng.
- Steven Regina, proj. leader
- David Wasserman, proj. leader

HLW International
- Keith Hanadel, sr. assoc.
- Steve Newbold, mging. partner

Scripps Productions
- Tom Killoy, VP of op.
- Bill Jarett, VP of eng.
- Mark Hale, exec. VP, CTO

Technology at work

- Adam RTS intercom system
- Avid Nitrous HD editing
- Grass Valley
  - Concerto 128x128 router
  - Kalypso production switcher
  - LDK5000 HD cameras
- Leitch modular A/D D/A and synchronizers
- Panasonic plasma displays
- Pinnacle FXDeko II
- Solid State Logic C100 digital broadcast console
- Sony IMX tape machines

WWE
takes production to a higher output level

At the World Wresting Entertainment's (WWE) digital production facility in Stamford, CT, content is king. This all-digital facility is responsible for more than five hours a week for national broadcast, 60 hours for international broadcast, three hours for Web broadcast and more than five hours for promos and live event support. Add to that 16 pay-per-view titles, 50 hours for VOD and more than 30 home video DVD releases each year, and it's clear that this is no ordinary workflow.

Starting in late 2001, the transformation from a nearly analog plant (built in 1987) to full digital began. Today, sophisticated signal distribution and unlimited access to more than 80,000 hours of media assets is only part of the story. The facility has taken an inherently digital, quick turnaround news approach and applied it to its sports network-style workflow.

The SDI facility includes a multicamera production studio, three online editing suites with hybrid editing ability, three post audio rooms, two music recording studios, 18 nonlinear rooms, graphics suites and six tape-to-tape offline rooms — all tightly linked via Ethernet.

A Grass Valley open SAN with 2000 hours of shared storage is at the heart of the facility's productivity, where all program elements are stored and accessed by four Grass Valley PVS 1100 Profile XP Media Platform servers. These servers are in turn controlled by several EditWare Fastrack hybrid edit controllers installed in the online edit suites, which are also seamlessly tied to nine Grass Valley NewsEdit XT NLE systems. To access media outside this environment, multiple Telestream FlipFactory systems are used.

For its graphics-intensive productions, the WWE uses a variety of systems, including SGI, Apple and Windows platforms running discreet Flame, Apple Shake, Motion and Adobe's Creator suite. Multi-layered 3-D elements are created with such high-end software as Maya Unlimited, in tandem with an onsite render farm of workstations configured by Boxx Technologies.

The music department composes and records original music on an AMS Neve Capricorn audio console, while the company's post audio department uses Fairlight Audio Systems and Euphonix Systems 5 consoles for finishing and mixing.

The hundreds of audio and video sources used in production are handled by a 128x128 Trinix for SDI video signals; a 128x128 Trinix for AES audio; a 64x64 Venus for analog video signals; a 64x64 Venus for four-channel analog audio; a 64x64 Venus for time code reference; and a 96 I/O Venus for data. All the routers and conversion modules are controlled by Grass Valley's Jupiter and Encore systems.

There's also a full complement of Kameleon and Gecko modular gear for D/A signal conversion and fiber-optic transmission feeds. All modular systems are interfaced via Grass Valley's NetCentral monitoring software and manipulated by Newton control panels. The facility uses Grass Valley's Andromeda tally system, which supports the multiple edit suites and monitor walls throughout the building. ■

Design team

WWE
- Marty Ludwin, sr. dir. of eng.

By Request Communications
- David Haralambou

Russ Berger Design Group
- Russ Berger, AIA
- Robert Traub, AIA

National TeleConsultants
- Ed Hobson
- C. Stanley Ellington

Chris Green, music and post-audio technical

Craig Thomas, graphics, networking and NLE tech.

Grass Valley Sys. Integration Group

Technology at work

Grass Valley
- Trinix routing switchers
- Venus routing switchers
- NewsEdit XT NLE systems
- NewsBrowse asset management
- Open SAN
- Kameleon modular gear
- Gecko modular gear
- Profile PVS 1100 XP servers
- NetCentral monitoring software
- Andromeda Tally system
- Kalypso, 4000, 1200 switchers

KNTV-TV
moves to San Bruno Mountain

KNTV served the Salinas and Monterey, CA, markets for 45 years from Loma Prieta Mountain. In 2001 KNTV switched to covering the San Jose, San Francisco and Oakland DMA. In order to improve coverage, the station decided to move the transmitter location to San Bruno Mountain.

Although KNTV's tower site was an existing facility on a mountaintop near the San Francisco airport, there were both FAA and environmental concerns due to the fact that the tower height was being increased by 57ft. It took three and a half years of planning, petitions, hearings and legal motions that added challenge, time and cost to this project.

Besides monitoring, there is only 30ft of analog signal path between the DA converters and the transmitter inputs. KNTV's new transmitter site was designed to be as reliable as possible, with all systems configured as dual and most as hot standby. The Thales OPTIMUM solid-state VHF NTSC and DTV parallel transmitters satisfied this need. Liquid cooling offered the station two important benefits. The transmitter cabinets are physically smaller because there are no air plenums. It also helps reduce operating expenses because heat energy is transferred outside the building, minimizing the requirement for building cooling systems.

The transmitter facility was remodeled to the extreme with construction and project management services provided by McCormick Construction. The existing 35ft x 35ft cement block building was completely stripped before the new construction proceeded. A new roof, new electrical, new flooring, new HVAC, new security system and water storage systems completed the building upgrade. A total upgrade to current seismic code for both the building and the tower were completed. In addition, the existing tower was stripped, and the top 110ft was replaced with new steel before the new Dielectric antennas and transmission line were installed. A new grounding system was required to protect all the solid-state hardware from lightning strikes. SAE designed and installed a special grounding system that provides 5Ω to ground from anywhere on the site.

Emergency power for the site's entire load was installed, including a new UPS, automatic transfer switch, diesel generator and fuel storage system. GE provided a kinetic energy UPS system with sufficient capacity to keep KNTV on-air during any momentary power bumps or surges. The emergency power system is fully automatic with adequate fuel storage to keep the site on-air at full power for up to seven days. ■

Design team

Thales Broadcast & Multimedia
- Gordon Gummelt, control and electrical
- Henry Fries, electrical and RF
- Jean Labarre, control and electrical
- Bill Onyski, site layout design
- Todc Loney, commissioning eng.

KNTV
- Richard Swank

Gensler, architect
Massetti, MEP consultant
McCormick, construction and mgmt.
Rosendin Electric, electrical
Seacomm Erectors, tower work

Technology at work

Thales OPTIMUM solid-state liquid-cooled transmitters TDV216KOLV, TAV260KOLAS

Broadcast Engineering 5th annual EXCELLENCE AWARDS

Category: *RF systems*
Submitted by: *Axcera*

WCJB-TV's new digital transmitter

WCJB-TV began operation in 1971 serving Gainesville, FL. Eleven years later, the station built a new transmission facility, installing a new Townsend 120kW klystron transmitter. Nearly 20 after that, the station began planning for the addition of a digital transmitter.

Because the station is owned by Diversified Communications, which owns multiple television stations throughout the eastern United States, it made sense to take advantage of the combined purchasing power of these stations. WCJB and the other Diversified stations determined that Axcera offered some of the most technologically advanced products and had a strong reputation of customer satisfaction. The station's were able to choose from a wide selection of solid-state and IOT-based transmitter offerings. This became important, as WCJB's DTV transmitter output power requirements changed several times throughout the project cycle.

With the primary goal of using the existing facility, it quickly became obvious that something would need to be done with the station's aging Townsend analog transmitter to allow the building to accommodate both the analog and DTV transmitters. Being an externally diplexed design, the Townsend was actually made up of three power amplifier cabinets. WCJB determined that it would be necessary to completely replace the analog transmitter with a more space-efficient unit. The station chose an Axcera Visionary series dual-tube IOT transmitter.

In addition to requiring a much smaller footprint than the Townsend, the station saw other benefits to replacing the analog transmitter. The efficiency of the Visionary IOT transmitter was superior to that of the klystron-based unit. Additionally, after 20 years of operation, the Townsend was beginning to show its age. By installing the new analog transmitter, the station could improve both the efficiency and the reliability of its analog plant.

For DTV, the station's initial allocation required a transmitter output power of only a couple thousand watts. WCJB felt that this power level was too low to replicate its current coverage area, so it applied for maximization, which would have required a 15kW transmitter. Unfortunately, this request was initially rejected by the FCC, so the station had to petition the FCC for approval.

The FCC finally approved the station's application, however WCJB determined that it would be most cost effective to build out to its current power level of 344kW. At this power level, the station decided that it made sense to select a solid-state digital transmitter, and the station chose the Axcera Innovator DT solid-state unit.

Because the station had already decided to use the existing facility, the next challenge became to maintain the NTSC transmissions during the replacement of the NTSC transmitter while at the same time creating space for the DTV transmitter. To accomplish this, the Visionary power amplifier cabinets and RF system were installed in their permanent location, but the exciter/driver and NTSC monitoring racks were initially installed on wheels. When the Townsend transmitter was removed, the exciter and monitoring racks were rolled to their final location and the wheels were removed.

The site was now ready for the new Innovator solid-state digital transmitter. It was delivered, installed and plumbed into the RF system. The system was brought up to power on schedule and both transmitters are operating well. ■

Design team

WCJB
- Steve Ingram, CE

Axcera
- Dave Benco, dir. of sales
- Jeff Heldman, app. eng.
- Ed Ritz, sr. field service eng.
- Walt Beaver, sr. field service eng.

Technology at work

Axcera
- Visionary HP80DAW NTSC transmitter
- Innovator DT-LDU2A-8 DTV transmitter

Dielectric
- Filters and combiners
- Transmission line and antenna

MYAT filters and combiners

Company directory

A

Ac-cetera
Pittsburgh, PA; Tel: 412-344-8609; Web: www.ac-cetera.com

Accom
Menlo Park, CA; Tel: 650-328-3818; Web: www.accom.com

AccuWeather
State College, PA; Tel: 814-235-8601; Web: www.accuweather.com

Acrodyne Industries
Cockeysville, MD; Tel: 410-568-2105; Web: www.acrodyne.com

Active Power
Austin, TX; Tel: 512-836-6464; Web: www.activepower.com

ADC
13625 Technology Dr, Eden Prairie, MN 55344-2252; Tel: 952-938-8080; Toll Free: 800-366-3889; Fax: 952-917-1717; Web: www.adc.com

For over 50 years, ADC has lead the industry in audio, video, and data patching products, a tradition that continues today in its state-of-the-art manufacturing facilities. Designing, engineering, and manufacturing virtually all of our own components, we have established ourselves as a premier builder of these critical industry products for broadcasting and entertainment.

Adrienne Electronics
Las Vegas, NV; Tel: 702-896-1858; Web: www.adrielec.com

Adtec Digital
Nashville, TN; Tel: 615-256-6619; Web: www.adtecinc.com

Advanced Test Equipment Rentals
San Diego, CA; Tel: 858-558-6500; Web: www.atecorp.com

Advent Communications
Chesham, Bucks United Kingdom; Tel: +44 1494 774400; Web: www.adventcomms.com

AJA Video Systems
443 Crown Point Cir, Grass Valley, CA 95945; Tel: 530-274-2048; Fax: 530-274-9442; E-mail: sales@aja.com; Web: www.aja.com; Contact: Sales

Alcatel
Plano, TX; Tel: 972-519-2641; Web: www.alcatel.com/microwave

Allen Osborne Associates
Westlake Village, CA; Tel: 805-495-8420; Web: www.aoa-gps.com

Alticast
Austin, TX; Tel: 512-437-4300; Web: www.alticast.com

AMCO Engineering
Schiller Park, IL; Tel: 847-671-6670; Web: www.amcoengineering.com

ANALOG WAY
New York, NY; Tel: 212-269-1902; Web: www.analogway.com

Angenieux
Totowa, NJ; Tel: 973-812-3858; Web: www.tccus.com

Anixter
Glenview, IL; Tel: 224-521-8425; Web: www.anixter.com

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

Anton/Bauer
Shelton, CT; Tel: 203-929-1100; Web: www.antonbauer.com

Apple
Cupertino, CA; Tel: 408-974-1010; Web: www.apple.com/finalcutstudio

AR Products
Lexington, MA; Tel: 787-862-7200; Web: www.arproducts.org

Arcatron
Phoenix, AZ; Tel: 602-843-2589; Web: www.arcatron.com

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

Ascent Media Systems and Technology Services
100 Stonehurst Ct, Northvale, NJ 07647; Tel: 201-767-1200; Fax: 201-784-8637; E-mail: sales@afassoc.com; Web: www.afassoc.com; Contact: Greg Willis

Associated Press ENPS
Washington, DC; Tel: 202-736-1100; Web: www.enps.com

Astro Systems
Burbank, CA; Tel: 818-848-7722; Web: www.astro-systems.com

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

ATI - Audio Technologies
Horsham, PA; Tel: 215-443-0330; Web: www.atiaudio.com

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

Audio Accessories
Marlow, NH; Tel: 603-446-3335; Web: www.patchbays.com

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

Audiolab Electronics
Roseville, CA; Tel: 916-784-0200; Web: www.audiolabelectronics.com

auto.des.sys
Columbus, OH; Tel: 614-488-8838; Web: www.formz.com

Autocue Systems
Charlotte, NC; Tel: 800-293-0118; Web: www.autocue.com

AutoPatch
Cheney, WA; Tel: 509-235-2636; Web: www.autopatch.com

Autoscript
London United Kingdom; Tel: +44 20 7538 1427; Web: www.autoscript.tv

AVEC
Finleyville, PA; Tel: 412-429-2000; Web: www.aveceng.com

Avid Technology
1 Park W, Tewksbury, MA 01876; Tel: 978-640-5678; Toll Free: 800-230-2843; Fax: 978-640-6953; E-mail: robin_gosselin@avid.com; Web: www.avid.com; Contact: Robin Gosselin

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

Avitech
Redmond, WA; Tel: 425-885-3863; Web: www.avitechvideo.com

AVS Graphics & Media
Salt Lake City, UT; Tel: 801-975-9799; Web: www.avsgmedia.com

Axcera
103 Freedom Dr, PO Box 525, Lawrence, PA 15055; Tel: 724-873-8100; Toll Free: 800-215-2614; Fax: 724-873-8105; E-mail: info@axcera.com; Web: www.axcera.com; Contact: Mike Rosso

Axon Digital Design
UDENHOUT Netherlands; Tel: +31 13 5116666; Web: www.axon.tv

AZCAR
121 Hillpointe Dr, Canonsburg, PA 15317; Tel: 724-873-0800; Toll Free: 888-873-0800; Fax: 724-873-4770; E-mail: john.luff@azcar.com; Web: www.azcar.com; Contact: John Luff

Azden
Franklin Square, NY; Tel: 516-328-7500; Web: www.azdencorp.com

B

B&H Photo Video
New York, NY; Tel: 212-444-5028; Web: bhphotovideo.com

BAG END Loudspeaker Systems
Barrington, IL; Tel: 847-382-4550; Web: www.bagend.com

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

Barco
3240 Town Point Dr, Kennesaw, GA 30144; Tel: 770-218-3200; Fax: 770-218-3250; E-mail: gregg.echols@barco.com; Web: www.barco.com; Contact: Gregg Echols

Barco is a world leader in professional markets, in which it offers display and visualization solutions. Based upon in-depth market knowledge, the company designs and develops solutions for large screen visualization, display solutions for life-critical applications,and systems for visual inspection.

Bauhaus Software
San Antonio, TX; Tel: 210-212-7530; Web: www.bauhaussoftware.com

Baystor
Apollo Beach, FL; Tel: 888-229-7867; Web: www.baystor.com

Behringer
Bothell, WA; Tel: 425-672-0816; Web: www.behringer.com

Belden Cable
Richmond, IN; Tel: 765-983-5200; Web: www.beldencdt.com

Bella
Burbank, CA; Tel: 818-563-9500; Web: www.bella-usa.com

Benchmark Media Systems
Syracuse, NY; Tel: 315-437-6300; Web: www.benchmarkmedia.com

Berkeley Nucleonics
San Rafael, CA; Tel: 415-453-9955x265; Web: www.berkeleynucleonics.com

Indicates advertisers

Company directory

Bescor Video
Farmingdale, NY; Tel: 631-420-1717; Web: www.bescor.com

Bittree
Glendale, CA; Tel: 818-500-8142; Web: bittree.com

Blackmagic Design
Las Vegas, NV;
Tel: 702-257-2371; Web: www.blackmagic-design.com/

Bluefish444
S Melbourne, Vict Australia;
Tel: +61 39682 9477; Web: www.bluefish444.com

Blueline Technology
Lewisville, TX; Tel: 972-353-2583; Web: www.bluelinetech.com

Bogen Imaging
Ramsey, NJ; Tel: 201-818-9500; Web: www.bogenimaging.us

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

Brauner
Las Vegas, NV; Tel: 702-365-5155; Web: www.braunerusa.com

Brick House Video
New York, NY; Tel: 212-967-1774; Web: www.brickhousevideo.com

Brightline
Bridgeville, PA; Tel: 724-457-0717; Web: www.brightlines.com

Broadata Communications
Torrance, CA; Tel: 310-530-1416; Web: www.broadatacom.com

Broadcast Microwave Services
12367 Crosthwaite Cir, Poway, CA 92064; Tel: 858-391-3050; Toll Free: 800-669-9667; Fax: 858-391-3049; E-mail: dept100@bms-inc.com; Web: www.bms-inc.com; Contact: Jim Kubit (West)

Broadcast Software Solutions
Atlanta, GA; Tel: 770-978-9450; Web: www.broadcastsoftware.tv

Broadcast Supply Worldwide
Tacoma, WA; Tel: 253-565-2301; Web: www.bswusa.com

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

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

Burle Industries
Lancaster, PA; Tel: 717-295-6888; Web: www.burle.com

Burlington A/V Recording Media & Equipment
Oceanside, NY; Tel: 516-678-4414; Web: www.burlington-av.com

Burst Electronics
Corrales, NM; Tel: 505-898-1455; Web: www.burstelectronics.com

C

C-COR
Centennial, CO; Tel: 303-967-9803; Web: www.c-cor.com

Cabinetworks
Canfield, OH; Tel: 330-533-0306; Web: www.cabinetworks.com

Calrec Audio
Nutclough Mill, Hebden Bridge HX7 8EZ United Kingdom; Tel: +44 (0) 1422 842159; Toll Free: +44 (0) 1422 842159; Fax: +44 (0) 1422 845244; E-mail: enquiries@calrec.com; Web: www.calrec.com; Contact: Jim Wilmer

CALREC

With over 40 years experience in the audio bus ness, Calrec Audio manufacture high quality product on and live-to-air audio mix ng consoles exclusively for broadcasters. The System Plus platform of Alpha, Sigma and Zeta consoles offer broadcasters a wealth of upgraded specifications, including expanded monitoring, TFT metering and surround sound channels.

Camplex
Emporia, KS; Tel: 620-342-7743; Web: www.camplex.com

Canare
531 5th St Unit A, San Fernando, CA 91340; Tel: 818-365-2446; Fax: 818-365-0479; E-mail: info@canare.com; Web: www.canare.com

CANARE

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Canon
Ridgefield Park, NJ;
Tel: 201-807-3300;
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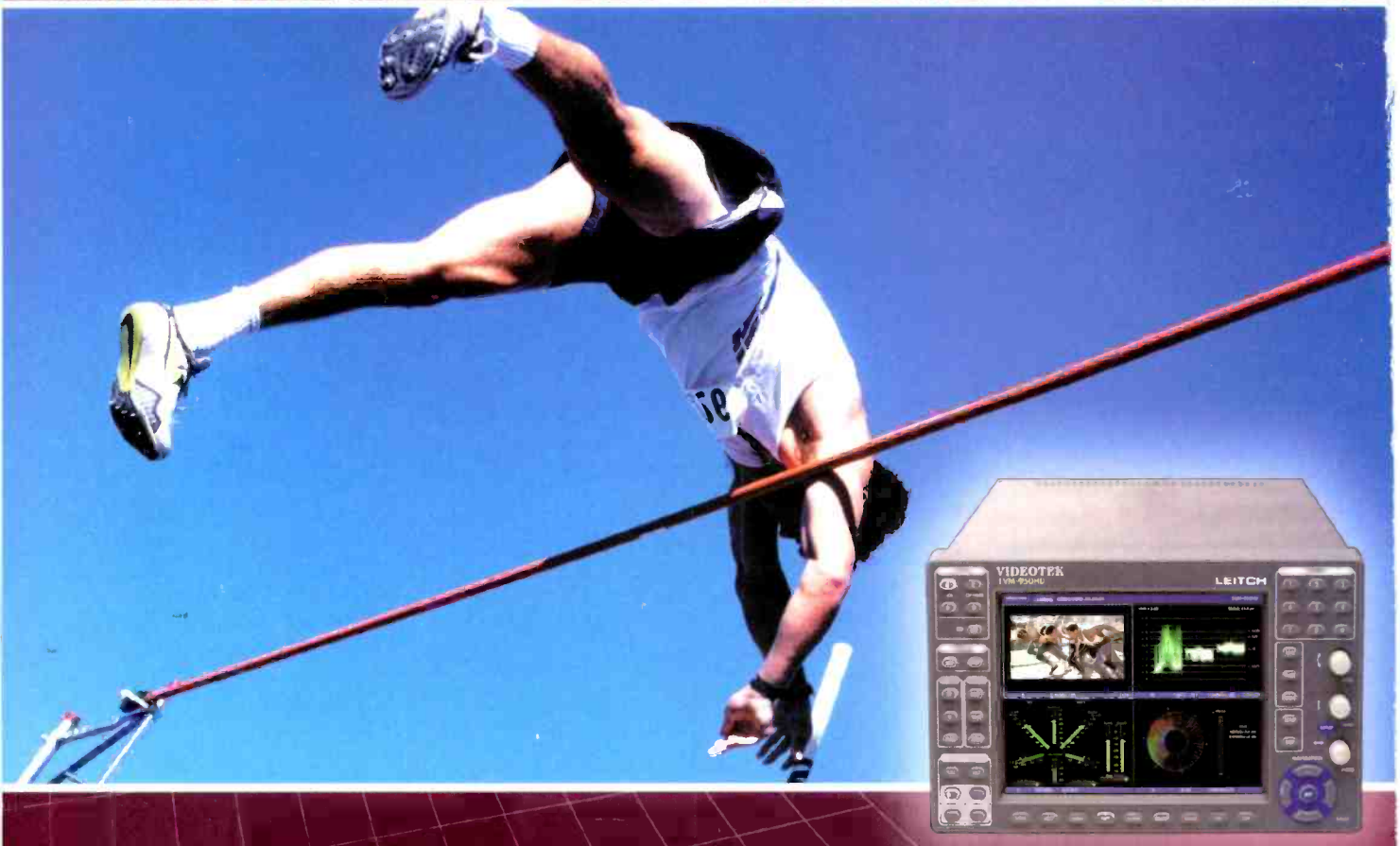

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