Buyers Guide and Web Reference 2003

Vote for your favorite installation and win!
We’ve Got What You Want

It’s New. It’s Wheatstone. It’s DIGITAL!
The D-5.1 Live Television Console

Wheatstone
tel 252-638-7000/www.wheatstone.com

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Harris Broadcast Manager...All Equipment And Networks At Your Fingertips!

Use this advanced broadcast management system to improve efficiency and to lower operating costs. Consolidate expert manpower. Cut your trouble response time. Increase your broadcast system availability. Enhance your operating performance with these additional benefits:

- Fully exploit DTV studio and transmitter equipment capabilities.
- Gain value-added benefits from legacy analog systems and building services.
- Profit from centralized equipment status displays for local and remote equipment.
- Match modular design to your needs – simple single system in a local station to a complex multistation environment.
- Support multiple users with assigned screen-views and privileges.

Manage wisely. Manage profitably. Harris Broadcast Manager ... from the people who know broadcasting and where it’s going. Visit us at www.broadcast.harris.com to learn more.
This year’s newly designed *Broadcast Engineering Buyers Guide* is packed with even more information than last year. The “Product Directory” section features hundreds of listings divided into categories to make it easy to find the product you need for your digital transition. Phone numbers are included with these listings for easy reference.

For detailed contact information on more than 400 manufacturers and dealers, including Web addresses, turn to the “Manufacturers/Dealers Addresses” section on page 85. If it’s systems integration services you need, systems integrators are grouped together on page 97.

The Excellence Awards are back and even stronger this year. Turn to page 45 to view this year’s entries. Seeing how these companies handled the challenges associated with their new facilities may give you ideas you can implement in your own projects.

Vote for your favorite installation at our Web site, www.broadcastengineering.com. We’ll announce the winners in our March issue and award plaques to the winners at NAB2003. Readers that vote online will be eligible for a drawing of *Broadcast Engineering* T-shirts.

Laura Collins, associate editor

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**ON THE COVER:**

(clockwise from top left) MER-21024x1024 serial component digital router at Echostar in Cheyenne, WY (photo courtesy AZCAR); cabling at Echostar’s Cheyenne facility (photo courtesy AZCAR); Dielectric’s TLMA dualband antenna; portion of a headend using Minerva Networks products; Solid State Logic’s Avid Film/Post Plus digital console at Soundtrack’s Studio F (photo by Dave King).
What company creates advanced media for the new and emerging technologies?

Focused on advanced technology, Maxell is on the cutting edge of professional media development. Our high-definition products, HDCAM and D-5, meet the needs of even the most demanding applications. New manufacturing processes and tape formulations provide unrivaled performance both on location and in the studio. And, in addition, our data storage products (DVD-R, DVD-RAM and DLT-IV) continue to set standards for storage capacity and archival stability. Thus, Maxell plays a leadership role throughout the recordable media industry.

To learn more about Maxell Professional Media, call 800-533-2836 or visit www.maxellpromedia.com.
### Product Index

In this section, main categories and subcategories from the Product Directory are listed alphabetically to take you right to the page you need for the product you want. The main categories are highlighted in red. The page numbers on subcategories will take you to the first page of the main category they are listed under (ex. speakers are listed under Audio Accessories).

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broadcastengineering.com  DECEMBER 2002
That's the job of this SeaChange MPEG-2 video server. To safeguard the heart of your operation, your digital assets. Today SeaChange is the global leader in MPEG-2 digital video systems. Our servers are out in force, streaming over 350,000 channels worldwide. With ironclad, scalable solutions for broadcast, broadband and Internet, you can manage your most demanding applications and a variety of content—including play-to-air, video-on-demand, digital advertising and Internet streaming. What's more, the patented design of the SeaChange MediaCluster will keep you on the air all the time, offering the highest fault-resilience in the industry without costly mirroring. Which saves you the expense and complexity of working with redundant servers. So in addition to protecting your digital assets, SeaChange also protects your revenue streams, your technology investment and your business. And you have that from a reliable source.
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### Carry-Coder Field Proven!

In Las Vegas, the Carry-Coder saved the day for a national cable news network when their analog equipment came up short!

When a Los Angeles Morning Show needed a live wireless shot, they called on the BMS Carry-Coder...

Who can you call on?

More POWER means more COVERAGE and more ROBUST performance! That’s the Carry-Coder advantage.

We invite you to see for yourself what the Industry Leader can do!

Call us at 800-669-9667 or visit our website, www.bms-inc.com, for more information.

#### BMS Broadcast Microwave Services, Inc.

12367 Crosthwaite Circle #10 - Poway, CA 92064
Phone: 800-669-9667 or +1-858-391-3050
Web: www.bms-inc.com

---

**Note:** The content above is a natural representation of the product index and the Carry-Coder Field Proven! section. It is designed to be readable and understandable without requiring any further natural language processing.
Specifications:

- Model 53 [4.5 ... 1000 MHz, -72 ... +20 dBm]
  (w/ option EFA-B3, RF Preselection)
- Simultaneous Decoding & Measurement
- SMPTE 310 Serial Output
- 6 MHz SAW Filter

Measurements:

- Level
- Pilot Value +/- .1 Hz
- Carrier Frequency
- BER, SNR, MER, EVM
- FCC Shoulder

Displays:

- Ghost Pattern
- Frequency Response
- Constellation Diagram
- Amplitude/Phase Response
- Spectrum Display

ROHDE & SCHWARZ, INC.
7150-K Riverwood Drive
Columbia, MD 21046-1245
Phone: (410) 910-7800 Fax: (410) 910-7801

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http://www.rohde-schwarz.com
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Includes: Audio playback devices; Audio recorders/players (ATR, MD, etc.)
Alcorn McBride
407-298-5800
Euphonix

Audio Routing
Includes: Audio A/D-D/A converters; Audio compression; Audio DAs; Audio routers; Sample rate converters
Adrienne Electronics
702-896-1858; 800-782-2321
Aphex Systems
818-767-2929
Audioarts Engineering
252-638-7000
Auditronics
252-638-7000
A/LM-12d compact digital audio console

AutoPatch
909-235-2636; 800-622-0246
Axon Digital Design
+31 13511 6666

Benchmark Media Systems
315-437-6300; 800-262-4675
AD-24; DAC-24

Burst Electronics
909-398-1455

Chyron
631-945-2133

Datatex
909-394-9100; 800-882-9100

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+49 8152 93010

Euphonix

HDCD model two
650-846-1142; 818-766-1666
PMI model two HDCD processor; AM13, MA703, DM714 and MA704 MA1 converters

Evrtz Microsystems
905-335-3700; 877-995-3700
7720ADC-A4 quad analog audio-to-AES converter

EVS Broadcast Equipment
<32 4 362 7000

Extron Electronics
714-491-1500; 800-633-9876
Fairchild Semiconductor International
888-522-5372

FOR-A
714-381-3311

Fortel DTV
830-841-2286

Hotronic
408-378-3883

Image Video
416-750-8872

International Fiber Systems
203-426-1180; 800-824-5990

Kae
801-238-2300

Kings Electronics
603-909-5000; 888-909-5551

Klotz Digital America
678-966-9900

Knox Video Technologies
301-840-5805

Logitek audio engine, 64x64 digital router
908-252-3600

MicroVideo
+44 1223 834 119

Miranda Technologies
514-333-1772; 802-224-7882

Multidyne Video & Fiber Optic Systems
516-871-7276; 800-4TV-TEST

NVision
631-928-4433; 866-928-4433; +47 33 48 99 99

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602-843-2589

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502-738-1100; 800-821-4747

**Avalon**

733-756-3992

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**Avid Technology**

978-640-6789; 800-949-AVID

Avid Unity Media Manager

**Broadcast Software Solutions**

770-978-0707; 800-273-4033

SchoolTouch automated closing system

**BUF Technology**

858-451-1350

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**CGS Infographics Automation**

859-269-7512

Automated News Ticker school closings, news, sports, etc.

**Chyron**

631-845-2133

Chyron's Pro-Bel division automation systems

**Comprompter**

608-785-7768; 800-785-7765

NewsKing and EUR newsmroom and automation systems

**Computer Modules**

480-496-1881

**Crispin**

919-845-7744; 888-577-7913

AssetBase 2000 SQL database engine for asset management; ClipCopX server-to-server clip management for mirroring

**Digital Images**

651-688-0888

**Encoda Systems**

303-237-4006

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**Florical Systems**

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MediaMaster asset management and archive control

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513-459-3400; 800-622-0012

B.R.A.I.N centralized automation; Broadcast Manager central monitoring; PSIP Plus management system; NDCP network device control

**IBIS**

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**Imagine Products**

317-843-0706

Image Mine

**Inscriber Technology**

519-570-9111; 800-363-3400

Automation CG

**Kae**

801-238-2200

**Leightronix**

517-694-8000

TCD/IP networked managed video system controller

**Loech**

609-514-4022; 800-231-9673

AGV-1000

**MATCO**

408-496-1881

**Media Computing**

480-575-7281

**Miranda Technologies**

514-333-1772; 800-224-7882

**Miranda/Oxtel Imageline 2.3, HDTV master control**

**Motorola Satellite & Broadcast Network Systems**

858-404-2933

**Nesbit Systems**

609-799-5071

**Odetics Broadcast**

714-774-2300

**AIRD content manager**

**Omneon Video Networks**

408-585-5100; 888-861-5890

**Omnibus Systems**

530-470-1700

**GAMMA media archive system**

**ParkerVision**

904-473-1387; 800-532-8034

**PVT station for news; PVT Studio News; PVT learning**

**Quanet**

203-972-3199

**GenerationII news solution**

**Quartz**

530-839-2103; 888-638-8745

**QMC master control systems**

**Rack Release Systems**

626-395-0187; 800-475-7711

**RCS**

914-428-4600

**Sounder TV for audio asset management and playback in master control**

**Roscor**

847-299-8080
Product Directory

Ross Video
613-652-4886
Screen Subtitling Systems
+44 1473 831 700
SGI (Silicon Graphics Inc)
650-986-1980
SignaSys
408-998-8076
Centralized control and distribution of media assets
Sony Electronics
201-930-6342; 877-BE-STNY
Spencer Technologies
818-771-1850
Sundance Digital
407-380-7055
teklogic
818-610-3527
TANDBERG Television
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Telesystem
TeraTek Software
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530-478-3000; 800-824-8949
M2100 SDTV/HDTV digital master control system
Thomson Multimedia
800-962-4287
Saturn master control switcher tied to Jupiter control system
Triveni Digital
609-716-3505
Guidebuilder, Streambridge
Utah Scientific
801-575-9799
Video Design Software
631-249-4399
Videoframe
530-477-2000
VTECS signal monitoring system; VNODES spot signal monitors
Videomedia
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AVS Graphics & Media
801-975-9799
Burst Electronics
505-899-1455
Clark Wire & Cable
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Dolby Laboratories
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LM100 loudness meter
DVC Digital Video Computing GmbH
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EASI-Efficient Antenna Systems Inc
841-424-5079; 800-666-9531
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HBR-2500 broadcast transport
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Keywest Technology
913-492-4666; 800-331-2019
Leightronix
517-694-8000
Matrox Electronic Systems - Video Products Group
514-685-2638; 800-361-4903
Media Concepts
918-252-3000
Motorola
215-223-1080; 800-523-6678
Motorola Satellite & Broadcast Network Systems
856-404-2933
Multidyne Video & Fiber Optic Systems
516-671-7278; 800-47V-TEST
Nickless Shirmer & Co
859-777-6640; 800-543-1584
Opticom
858-450-0143; 800-867-8426
DVX-5000 broadcast SDI/DTV fiber cable transmission
Prime Image
408-867-6519
Qwest Digital Media
615-650-6000
Uplink and transmitter facility
Rack Release Systems
626-295-0197; 800-475-7711
Sabre Communications
712-258-6690 ext209; 800-369-8690
ScientificAtlanta
770-238-5000; 800-433-6222
Galaxy digital rack system; 169/216 PowerVu video compression system
Scopus Network Technologies
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<table>
<thead>
<tr>
<th>Company</th>
<th>Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seachange International</td>
<td>978-897-0100</td>
</tr>
<tr>
<td>Snell &amp; Wilcox</td>
<td>408-260-1000; 800-827-4544</td>
</tr>
<tr>
<td>Sony Electronics</td>
<td>201-330-6342; 877-885-SONY</td>
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<tr>
<td>Standard Communications</td>
<td>310-532-5300; SDR-22 CI digital receiver</td>
</tr>
<tr>
<td>Teklogic</td>
<td>818-610-3527</td>
</tr>
<tr>
<td>Thales Broadcast &amp; Multimedia</td>
<td>413-569-0116</td>
</tr>
<tr>
<td>Thomson Grass Valley</td>
<td>530-478-3000; 800-824-8949</td>
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<tr>
<td>Triveni Digital</td>
<td>609-716-3505</td>
</tr>
<tr>
<td>Videotek</td>
<td>610-327-2292; 800-800-5719</td>
</tr>
<tr>
<td>Wohler Technologies</td>
<td>805-383-5500</td>
</tr>
<tr>
<td>Video Rentals Inc (VRI)</td>
<td>800-255-2874</td>
</tr>
<tr>
<td>Videotek</td>
<td>610-327-2292; 800-800-5719</td>
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<tr>
<td>Xintekvideo</td>
<td>203-348-9229</td>
</tr>
<tr>
<td>Model VPSOA Ghost Buster</td>
<td>321-999-0457</td>
</tr>
<tr>
<td>Zandar Technologies</td>
<td>831-372-6205; 877-ADDENDA</td>
</tr>
<tr>
<td>Vinten</td>
<td>914-268-0100; 888-2-VINTEN</td>
</tr>
<tr>
<td>Winemiller Communications</td>
<td>717-241-4400; 888-486-3031</td>
</tr>
<tr>
<td>Camplex</td>
<td>620-342-7743; Canon USA, Broadcast and Communications Division</td>
</tr>
<tr>
<td>SAR A</td>
<td>714-894-3311</td>
</tr>
<tr>
<td>Parker GmbH</td>
<td>+49 69 613 900-01; TR3 remote head</td>
</tr>
<tr>
<td>ParkerVision</td>
<td>904-737-1367; 800-532-8034</td>
</tr>
<tr>
<td>Radamec</td>
<td>732-846-0500; 877-RADAMEC</td>
</tr>
<tr>
<td>Sechelter</td>
<td>518-867-4900; DV series and Video 18 fluid heads</td>
</tr>
<tr>
<td>Shotoku Camera Support Systems</td>
<td>661-775-7736; 866-746-8658</td>
</tr>
<tr>
<td>Sintel - Systems International</td>
<td>813-837-0001</td>
</tr>
<tr>
<td>Spencer Technologies</td>
<td>818-771-1850</td>
</tr>
<tr>
<td>Teklogic</td>
<td>818-610-3527</td>
</tr>
<tr>
<td>Telecast Fiber Systems</td>
<td>508-754-4858</td>
</tr>
<tr>
<td>TRS221 bi-directional link for POE cameras</td>
<td>201-848-9618</td>
</tr>
<tr>
<td>Vinten</td>
<td>914-268-0100; 888-2-VINTEN</td>
</tr>
<tr>
<td>Winemiller Communications</td>
<td>717-241-4400; 888-486-3031</td>
</tr>
<tr>
<td>Camera Remote Controls</td>
<td>Remote control tower cameras for traffic and weather reporting</td>
</tr>
</tbody>
</table>

**Camera Support**

Includes: Camera support products (tripods), Pan/tilt heads

- **AVEC**
  - 412-429-2000
  - Camera remote controls
- **Band Pro Film/Video**
  - 818-841-9655
  - Camera remote controls
- **Canon USA, Broadcast and Communications Division**
  - 714-894-3311
  - Remote control tower cameras for traffic and weather reporting
- **FOR-A**
  - 201-930-6342; 877-865-SONY
  - Remote control tower cameras for traffic and weather reporting
- **Panther GmbH**
  - 310-532-5300
  - Remote control tower cameras for traffic and weather reporting
- **ParkerVision**
  - 904-737-1367; 800-532-8034
  - Remote control tower cameras for traffic and weather reporting
- **Radamec**
  - 732-846-0500; 877-RADAMEC
  - Remote control tower cameras for traffic and weather reporting
- **Sachtler**
  - 201-818-9500; 877-865-SONY
  - Remote control tower cameras for traffic and weather reporting
- **Sintel - Systems International**
  - 818-771-1850
  - Remote control tower cameras for traffic and weather reporting
- **Spencer Technologies**
  - 918-867-4900
  - Remote control tower cameras for traffic and weather reporting
- **Sintel - Systems International**
  - 818-837-0001
  - Remote control tower cameras for traffic and weather reporting
- **Teklogic**
  - 818-610-3527
  - Remote control tower cameras for traffic and weather reporting
- **Telecast Fiber Systems**
  - 508-754-4858
  - Remote control tower cameras for traffic and weather reporting
- **Vinten**
  - 914-268-0100; 888-2-VINTEN
  - Remote control tower cameras for traffic and weather reporting

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Includes: Camera remote controls; Robotic camera controls; Virtual sets

- **Addenda Electronics**
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Radamec
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RF Technology
203-866-4283; 800-762-4369
Remote "Beauty" camera systems broadcast quality weather-proof camera systems

Sachtler
516-867-4900
Hot Pod tripod

Shotoku Camera Support Systems
661-775-7736; 866-746-8658
Sintel - Systems International
813-837-0001
16x9
818-972-2839
DuoPod attachments and monopod; EasyRig camera support

Teklogic
818-610-3527
Television systems

Vinten
914-266-3000; 800-324-2509
Panasonic Broadcast & Television Systems
800-528-8601
AJ-HDC27 Varicam

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Hitachi Denshi America
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D2 MV 100A one-piece DVD camcorder

Hoodman
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HXL-1 Hoodfinder ENG viewfinder hood

IDX System Technology
310-691-2800
A-AB2E adapter plate; A-LWR, A-EWR, A-SWR, A-E2NP, C-E2XLK and C-NP2E cable; P-V/S plates

Ikegami Electronics
201-368-9171
HL-45AW and HC-400W; DNS-201W digital disk camera/recorders; HL-DVW DVCAM camcorder

JAI AmericA
978-957-8587
JVC
973-317-5000
GY-DV5000 camcorder

Lightware
303-744-0202
Aircraft shipping cases

Link Research
+01923 200 900
LinkXP digital wireless camera link

Media Concepts
918-252-3600
Panasonic Broadcast & Television Systems

Sony Electronics
MSV-900
201-930-6342; 877-865-SONY
MSV-900 MPEG IMX camcorder

Teklogic
818-610-3527
Telecast Fiber Systems
508-754-4858
CopperHead camera-mounted fiber-optic multiplexer

Telemetries
201-848-9818
Coax camera control systems

Telescript
201-767-6733
Teletypewriter for studio and ENG cameras

Thomson Grass Valley
503-478-3000; 800-624-8949
Thomson Multimedia Broadcast & Network Solutions

Viper FilmStream
800-962-4287
Digital cameras for 4:3 and 16:9 standard definition, high definition and digital cinema; Viper FilmStream camera

VideomagnetecS
719-390-1313; 800-432-3887
Winemiller Communications
717-241-4400; 888-486-3031
Remote control tower cameras; Mast cameras; Wireless camera systems

WolfVision
650-802-0786; 800-356-WOLF
VZ series Visualizer document cameras
The new DV 15 Fluid Head is the perfect combination with any digital ENG camcorder. It is yet another example of Sachtler’s proven quality being used to support the new generation of cameras. And with its central locking for immediate leg release, the new Hot Pod CF is the fastest tripod in the world. Its maintenance-free pneumatic gas spring effortlessly lifts the camera over six feet high. So why wait? Optimize your equipment now. With Sachtler!
Product Directory

Intercoms

Includes: Intercom

Clear-Com Intercom Systems

iStations

510-498-6666
Matrix Plus digital intercom systems; PL Pro party-line intercom systems; O/00 wireless intercom; iStations

Drake Electronics

+44 1727 871200

Encode Systems

303-237-4000

International Fiber Systems

203-426-1180; 800-824-5990

Klotz Digital America

678-966-9900

Media Concepts

918-252-3600

Lighting

Includes: Lighting

Acme Effects
+886 3 3215983
Intelligent lights; Effect lights; Xenon and Short Arc flashlamps; Metal Hide lamps

Alcon McBride

407-290-5800

Aspen Electronics

714-379-2515
A30 light; 30W camera light

Band Pro Film/Video

818-841-9655

Bescor Video

516-420-1717; 800-646-7182

Buhl Industries

973-423-2800; 866-520-BUHL
EPS-150 series Buhlite ellipsoids; F70 series; Softcube portable softlight; S150 series softlight

Cinemills

818-843-4560

Cool-Lux

805-482-4820; 800-223-2589
LK2000 mini-cool AC/DC light; SL3000 AC/DC on-camera softlight/broadlight; LK4401 Hollywood softlight

Dedolight USA

973-857-8118
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Devlin Design Group

858-535-9800

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732-919-3119; 800-678-6102
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Entertainment Technology

972-640-1640

Hi-Tech Enterprises

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Kino Flo

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KW/2 Lighting Products

972-556-2376; 800-949-7854

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Azden
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SGM series shotgun microphones
Bescor Video
516-420-1717, 800-945-7182
GTT20 fishpoles
Bogen Photo
201-818-9500
GTT20 fishpoles
Broadcast Richardson
630-208-2200; 800-737-6937
Clark Wire & Cable
847-949-9944, 800-CABLEIT

Clear-Com Intercom Systems
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COMTEK
801-496-3466
Electro-Voice
952-884-4051
Gepco
847-795-9555; 800-366-0089
Hi-Tech Enterprises
727-546-6407; 888-324-2509
Hosa Technology
714-736-9270
Lectrosonics
505-892-4501; 800-821-1121
Micron Audio Products
973-857-8150
TRAM TR-50 microphones
Sennheiser
+49 5130 600 - 0
SKM 3072-U and SKM 5000 UHF-A handheld mics
Shure
847-866-2200; 800-25-SHURE
Sony Electronics
201-930-6342; 877-865-SONY
Telex Communications
952-736-4027; 877-863-4166
Video Products Group
805-383-5500
Video Rentals Inc (VRI)
800-255-2874

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805-499-3686

Microwave and Fiber
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ADC
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Advent Communications
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Alcatel
972-519-2641; 800-252-2835
Andrew
708-249-3300; 800-DIAL4RF
Artel Video Systems
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Broadcast Richardson
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Canon USA, Broadcast and Communications Division
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Teracom Components
207-627-7474

Thales Broadcast & Multimedia
413-565-0116
Affinity for BWAT3,56HzWiFi

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Vehicles
Includes: ENG trucks; Satellite flyaway systems; Satellite uplink trucks

Advent Communications
+44 1494 774400

AVEC
412-423-2000
ENG vehicle; Production trucks; Mastvoice aural mast deployment announciator

Broadcast Richardson
630-209-2200; 800-737-6937
Continental Microwave
+44 1582 424 233
Diversified Marketing International
509-585-9377
Custom-built portable uplinks

Gerling and Associates
740-965-2888

Link Research
+01923 200 900

Logic Innovations
858-455-7200; 888-345-6442

Media Concepts
913-252-3600

National Mobile Television
310-782-9945; 800-242-0642

Color indicates advertiser

DECEMBER 2002
New England Satellite Systems  
508-842-4378  
Transportable satellite uplink and video production services  
RF Technology  
203-966-4282; 800-762-4389  
SN680/1048T flyaway satellite terminal; DST-144 flyaway satellite terminal  
Shook Mobile Technology  
210-651-5700; 888-651-5775  
Sintel - Systems International  
813-837-0001  
Sony Electronics  
201-930-6342; 877-865-SONY  
Teklogic  
818-610-3527  
TriPoint Global Communications  
866-866-4283; 800-762-4369  
SIMG60/140DT flyaway satellite terminal; DST-144 flyaway satellite terminal  
Shook Mobile Technology  
210-651-5700; 888-651-5775  
Sintel - Systems International  
813-837-0001  
Sony Electronics  
201-930-6342; 877-865-SONY  
Teklogic  
818-610-3527  
TriPoint Global Communications  
866-866-4283; 800-762-4369

Video Accessories

Includes: EAS products; VBI data software systems; GPS equipment; Time code equipment; Video accessories; Video captioning equipment; Video patch panels

ADC  
952-938-8080; 800-726-4266  
ProPatch professional video patch panels

Adrienne Electronics  
702-896-1558; 800-762-2321  
Allen Osborne Associates  
805-495-8420

HILOMAST telescopic masts

Analog Way  
212-289-1882  
Astra Systems  
818-849-7772; 877-88-ASTRO  
Audio Accessories  
603-446-3335  
2x24, 2x26 HDTV-ready, 2x32 mid-size cords

Band Pro Film/Video  
818-841-9655  
Bescor Video  
516-420-1717; 800-645-7182  
Bittree  
818-500-8142; 800-500-8142  
WECO composite and component; Mini-WECO composite and component

Brick House Video  
+44 238087 8026  
Broadcast Software Solutions  
770-978-0707; 800-273-4033  
WinMasterCG and CGXPress+ EAS software

Broadcast Video Systems  
905-764-1584  
VBI-232 encoder/decoder data transmission

Burst Electronics  
565-850-1455  
Cinekinetic  
+61 8 4 459 3690  
Clark Wire & Cable  
847-999-3944, 800-CABLEIT

Cool-Lux  
805-482-4820; 800-223-2589  
LC7136; LC7150 AC photo dimmer; LC7000 mini-cool daylight filter

D.W. Electrochemicals  
905-508-7580  
Stabilant 22 electronic contact enhancer

Da-Lite Screen Company  
219-267-8101; 800-622-3737  
Front and rear projection screens

DNF Controls  
818-896-3380

Drastic Technologies  
416-255-5636  
Media Reactor NLE and Media Reactor Junior file conversion software, Media Reactor for Active X SDK

DSC Labs  
905-673-3271; 800-267-5227

ESF  
310-322-2136

Everzt Microsystems  
905-335-3700, 877-995-3700

Extron Electronics  
714-491-1500; 800-533-9876  
Gepco  
847-795-9555; 800-966-0009  
Glidcam Industries  
508-830-1418; 800-600-2011  
Hoodman  
310-379-6981, 800-818-3946  
HD14 and HD24 HD monitor hoods; HMP8 and HMP13 monitor platforms

Horita  
949-489-0240

Imagine Products  
317-843-0768  
LTC portable time code reader

Kae  
801-238-2300

Keywest Technology  
913-492-4668; 800-331-2019  
DEVIS EAS messaging including Amber Alerts

Kings Electronics  
803-809-5600; 888-999-5551  
Video jacks; 7750 STD; 7770 Mini; 8600-1 Micro

Kramer Electronics  
908-735-0018; 800-275-6311

Leitch  
757-548-2300; 800-231-9673  
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- AV Presentations
- Video-conferencing
- Mosaic & Interactive Channels
- Security & Surveillance

www.zandar.com
Wohler Technologies
850-589-5676; 888-5-WOHLER

Video Compression Equipment
Includes: Compression encoder/decoders; Compression pre-processors; Statistical multiplexers; Video compression systems; Video noise reduction systems

Advent Communications
+44 1494 774 400

Broadcast Microwave Services
850-391-3050; 800-669-9667

Computer Modules
408-496-1881

Digital Vision (US)/Digital Vision AB
816-789-8111; +46 8 546 18200

DVM345 broadcast and audio codec system

DVX Digitalvideo Computing GmbH
+49 8152 93010

FDV-38000
858-450-0143; 800-887-8426

DyX-2000 and DvX-2200 video compression systems

DigiCipher II HD/SD encoder

Motorola
215-323-1000; 800-523-6678

Motorola Satellite & Broadcast Network Systems
859-404-2923

Nickless Shirmer & Co
859-727-6640; 800-543-1584

Omneon Video Networks
408-585-5100; 986-861-5690

MediaPort

Opticomm

FDV-38000
858-450-0143; 800-887-8426

DyX-2000 and DvX-2200 video compression systems

DigiCipher II HD/SD encoder

Motorola
215-323-1000; 800-523-6678

Motorola Satellite & Broadcast Network Systems
859-404-2923

Nickless Shirmer & Co
859-727-6640; 800-543-1584

Omneon Video Networks
408-585-5100; 986-861-5690

MediaPort

Opticomm

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Applications:
- Remote ENG
- Communications
- Field Strength Measurements
- Pop-up Jamming
- Remote Surveillance
- Noise Level Measurements
- Temporary Floodlighting
- Environmental Sensors
- Military Communications

QuickSet Pan & Tilt
Tripods, Nycoil

For Further Information Contact Jim Osborne
ALLEN OSBORNE ASSOCIATES, INC.
756 LAKEFIELD RD., BLDG. J • WESTLAKE VILLAGE, CA 91361
TEL: 85-495-8420 • FAX: 805-373-6067
EMAIL: j.osborne@aoa-gps.com • www.aoa-gps.com/hilomast.htm

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- Built-in Adj. Scalars- 4:3, 16:9...
- NTSC/PAL/SECAM/4.43/M/...
- Metal Cabinets and Protected Screens
- Mounts: Rack, Desktop, Wall
- Remote Control: GPI, IR, RS-232
- Scans: Under, Rotate, Reverse
- Pip, High Brights, Transflectives
- Many other Options

**Video Monitors**

- Includes: Line doublers/quadruplers; Plasma displays; Projectors; Video monitors; Video presentation equipment; Video walls

**Analog Way**
- 212-265-1902

**Aspen Electronics**
- 714-379-2515

**Astro Systems**
- 818-848-7722; 877-88-ASTRO

**Band Pro Film/Video**
- 818-841-9855

**Boland Communications**
- 949-367-9911; 900-918-9090

**Viewport video, multimedia and desktop monitors**

**Broadcast Richardson**
- 830-208-2200; 800-737-6937

**Chief Manufacturing**
- 952-894-6280

**DOLAIMD**
- 800-528-8601

**DNA newsroom production system; newsBYTE 50 editing system**

**Clarity Visual Systems**
- 503-570-0700

**Communications Specialties**
- 516-273-0404

**CTX International**
- 626-709-1000

**Da-Lite Screen Company**
- 219-297-8101; 800-622-3737

**Model 5000 portable overhead projector; G-200 and G-200 LC classroom overhead projectors**

**Data Check**
- 858-570-0101

**DVC Digitalvideo Computing GmbH**
- +49 8152 93010

**e-mediavision.com**
- +44 208 755 2014

**EVS Broadcast Equipment**
- +32 4 362 7000

**Extron Electronics**
- 714-491-1500; 800-633-9876

**Folsom Research**
- 916-859-2500; 888-414-SCAN

**PresentationPro audio/video seamless switcher**

**Gennum**
- 905-632-2966

**Gidecam Industries**
- 508-530-1414; 800-680-2011

**Ikegami**
- 201-368-9171

**HTM-50 series HDTV monitors; TM-20 and TM-17 series color monitors; PM black-and-white series monitors**

**Image Video**
- 416-750-8672

**Lighthouse/Lighthouse - US**
- 919-677-0327; +852 2192 1688

**Lightware**
- 800-211-9001

**MagicBox**
- 541-752-5654

**Aavelin RT CG; VIP video information player**

**Media Concepts**
- 918-252-3600

**Miranda Technologies**
- 514-333-1772; 800-224-7882

**Kaleido virtual monitor wall**

**Panasonic Broadcast & Television Systems**
- 800-528-8601

**AT-H317W 1080i/720p/480p HD monitor**

**PANORAMAdtv**
- 650-989-5676

**MONs/professional LCD in-rack video monitors**

**Pioneer Electronics**
- 818-981-9855

**PDP-433CMX and PDP-502MX plasma displays**

**Scientific-Atlanta**
- 770-236-5000; 800-433-6222

**ADV series of hybrid analog/digital monitors**

**SGI (Silicon Graphics Inc)**
- 650-960-1980

**Smell & Wilcox**
- 408-260-1000; 800-827-6454

**Sony Electronics**
- 201-930-6342; 877-885-SONY

**Teklogic**
- 818-610-3527

---

**Media 100**
- 508-460-1800; 800-773-1770

**Media Concepts**
- 918-252-3600

**Motorola Satellite & Broadcast Network Systems**
- 858-404-2933

**OGM Music**
- 323-461-2701; 800-421-1770

**Options International**
- 815-327-8090

**Panasonic Broadcast & Television Systems**
- 858-404-2933

**OGM Music**
- 323-461-2701; 800-421-1363

**Sonic Desktop Software**
- 818-718-9999; 800-454-1900

**Synergy edit controller**
- 918-252-3600

**Quantel**
- 800-528-8601

**DNA newsroom production system; newsBYTE 50 editing system**

---

**Pinnacle Systems**
- 650-526-1800

**Pixelan Software**
- 360-947-0112

**SpiceMaster Deluxe nonlinear editor plug-in; Video SpiceRack Pro/OrganicFX**

---

**newsBYTE 50**

---

**Product Directory**

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**Clarity Visual Systems**
- 503-570-0700

**Communications Specialties**
- 516-273-0404

**CTX International**
- 626-709-1000

**Da-Lite Screen Company**
- 219-297-8101; 800-622-3737

**Model 5000 portable overhead projector; G-200 and G-200 LC classroom overhead projectors**

**Data Check**
- 858-570-0101

**DVC Digitalvideo Computing GmbH**
- +49 8152 93010

**e-mediavision.com**
- +44 208 755 2014

**EVS Broadcast Equipment**
- +32 4 362 7000

**Extron Electronics**
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**Folsom Research**
- 916-859-2500; 888-414-SCAN

**PresentationPro audio/video seamless switcher**

**Gennum**
- 905-632-2966

**Gidecam Industries**
- 508-530-1414; 800-680-2011

**Ikegami**
- 201-368-9171

**HTM-50 series HDTV monitors; TM-20 and TM-17 series color monitors; PM black-and-white series monitors**

**Image Video**
- 416-750-8672

**Lighthouse/Lighthouse - US**
- 919-677-0327; +852 2192 1688

**Lightware**
- 800-211-9001

**MagicBox**
- 541-752-5654

**Aavelin RT CG; VIP video information player**

**Media Concepts**
- 918-252-3600

**Miranda Technologies**
- 514-333-1772; 800-224-7882

**Kaleido virtual monitor wall**

**Panasonic Broadcast & Television Systems**
- 800-528-8601

**AT-H317W 1080i/720p/480p HD monitor**

**PANORAMAdtv**
- 650-989-5676

**MONs/professional LCD in-rack video monitors**

**Pioneer Electronics**
- 818-981-9855

**PDP-433CMX and PDP-502MX plasma displays**

**Scientific-Atlanta**
- 770-236-5000; 800-433-6222

**ADV series of hybrid analog/digital monitors**

**SGI (Silicon Graphics Inc)**
- 650-960-1980

**Smell & Wilcox**
- 408-260-1000; 800-827-6454

**Sony Electronics**
- 201-930-6342; 877-885-SONY

**Teklogic**
- 818-610-3527
### Product Directory

<table>
<thead>
<tr>
<th>Company</th>
<th>Phone Numbers</th>
<th>Services Description</th>
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<tbody>
<tr>
<td>Telescript</td>
<td>201-767-6733</td>
<td>Teleprompter displays for studio, field production and news</td>
</tr>
<tr>
<td>TV One Multimedia Solutions</td>
<td>859-282-7303; 800-721-4044</td>
<td>Video Routing and Distribution: Control signal routers, Video DAs, Video processing amplifiers, Video routing switchers</td>
</tr>
<tr>
<td>Video Rentals Inc (VRI)</td>
<td>800-255-2874</td>
<td>Video Rentals Inc (VR!)</td>
</tr>
<tr>
<td>Videotek</td>
<td>610-327-2292; 800-800-5719</td>
<td>Video Routing and Distribution: Control signal routers, Video DAs, Video processing amplifiers, Video routing switchers</td>
</tr>
<tr>
<td>Ward-Beck Systems Ltd</td>
<td>416-325-5999; 800-771-2556</td>
<td>Video Routing and Distribution: Control signal routers, Video DAs, Video processing amplifiers, Video routing switchers</td>
</tr>
<tr>
<td>Wohler Technologies</td>
<td>650-589-5670; 800-8-WOHLER</td>
<td>MON in-rack LCD video monitors</td>
</tr>
<tr>
<td>WolfVision</td>
<td>650-802-0788; 800-356-WOLF</td>
<td>Video Routing and Distribution: Control signal routers, Video DAs, Video processing amplifiers, Video routing switchers</td>
</tr>
<tr>
<td>Zandar Technologies</td>
<td>321-339-0457</td>
<td>Video Routing and Distribution: Control signal routers, Video DAs, Video processing amplifiers, Video routing switchers</td>
</tr>
<tr>
<td>Adrienne Electronics</td>
<td>702-896-1858; 800-782-2321</td>
<td>MON in-rack LCD video monitors</td>
</tr>
<tr>
<td>AEA Video Systems</td>
<td>530-274-2048; 800-251-4224</td>
<td>Video DAs, Video processing amplifiers, Video routing switchers</td>
</tr>
<tr>
<td>AutoPatch</td>
<td>520-236-2636; 800-822-0246</td>
<td>Video DAs, Video processing amplifiers, Video routing switchers</td>
</tr>
<tr>
<td>Brick House Video</td>
<td>+44 23 8067-6026</td>
<td>Video DAs, Video processing amplifiers, Video routing switchers</td>
</tr>
<tr>
<td>Burst Electronics</td>
<td>505-888-1455</td>
<td>Video DAs, Video processing amplifiers, Video routing switchers</td>
</tr>
<tr>
<td>Camplex</td>
<td>629-342-7743; VTU-20A genlock timing system</td>
<td>Video DAs, Video processing amplifiers, Video routing switchers</td>
</tr>
<tr>
<td>Chyron</td>
<td>631-845-2133</td>
<td>Video DAs, Video processing amplifiers, Video routing switchers</td>
</tr>
<tr>
<td>Crystal Vision</td>
<td>+44 1223 506 515</td>
<td>Video DAs, Video processing amplifiers, Video routing switchers</td>
</tr>
<tr>
<td>Datatek</td>
<td>908-526-0242</td>
<td>Video DAs, Video processing amplifiers, Video routing switchers</td>
</tr>
<tr>
<td>Datatek</td>
<td>908-526-0242</td>
<td>Video DAs, Video processing amplifiers, Video routing switchers</td>
</tr>
<tr>
<td>Datatek</td>
<td>908-654-6100; 800-882-9100</td>
<td>Video DAs, Video processing amplifiers, Video routing switchers</td>
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<tr>
<td>Datatek</td>
<td>651-666-0889</td>
<td>Video DAs, Video processing amplifiers, Video routing switchers</td>
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<tr>
<td>DNF Controls</td>
<td>818-898-3380; SW32PS port switcher</td>
<td>Video DAs, Video processing amplifiers, Video routing switchers</td>
</tr>
<tr>
<td>DVC Digitalvideo Computing GmbH</td>
<td>+49 8152 93010</td>
<td>Video DAs, Video processing amplifiers, Video routing switchers</td>
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<tr>
<td>ESE</td>
<td>310-322-2136</td>
<td>Video DAs, Video processing amplifiers, Video routing switchers</td>
</tr>
<tr>
<td>Evertz Microsystems</td>
<td>905-335-3700; 877-995-3700</td>
<td>Video DAs, Video processing amplifiers, Video routing switchers</td>
</tr>
<tr>
<td>EVS Broadcast Equipment</td>
<td>+32 4 362 7000</td>
<td>Video DAs, Video processing amplifiers, Video routing switchers</td>
</tr>
<tr>
<td>Extrion Electronics</td>
<td>714-491-1500; 800-633-9876</td>
<td>Video DAs, Video processing amplifiers, Video routing switchers</td>
</tr>
<tr>
<td>Hanabi</td>
<td>714-894-3311</td>
<td>Video DAs, Video processing amplifiers, Video routing switchers</td>
</tr>
<tr>
<td>Gennum</td>
<td>905-832-2996</td>
<td>Video DAs, Video processing amplifiers, Video routing switchers</td>
</tr>
<tr>
<td>Heartland Video Systems</td>
<td>920-893-4204; 800-332-7088</td>
<td>Video DAs, Video processing amplifiers, Video routing switchers</td>
</tr>
<tr>
<td>Horita</td>
<td>949-489-0240</td>
<td>Video DAs, Video processing amplifiers, Video routing switchers</td>
</tr>
<tr>
<td>Hotronic</td>
<td>408-378-3683</td>
<td>Video DAs, Video processing amplifiers, Video routing switchers</td>
</tr>
<tr>
<td>Image Video</td>
<td>416-750-8872</td>
<td>Video DAs, Video processing amplifiers, Video routing switchers</td>
</tr>
<tr>
<td>Kae</td>
<td>801-238-2300</td>
<td>Video DAs, Video processing amplifiers, Video routing switchers</td>
</tr>
</tbody>
</table>

**Wohler Technologies**

- **MON in-rack LCD video monitors**
- **VAMP series of in-rack LCD video monitors offer SDI, analog and RGB (optional) video inputs. Units available include Quad 4, Triple 5.6" and 4, Dual 6.8", and 7" (16:9/4:3 switchable). The VAMP series provides LCD video plus the quality Wohler audio monitoring, (All units NTSC/PAL auto-sensing).**

**WolfVision**

- **650-802-0788; 800-356-WOLF**
- **AEC-1 10x1 video/audio routing switchers**

**Zandar Technologies**

- **321-339-0457**
- **SW32PS port switcher**
- **VTB-1D portable 10-bit SDI switcher; VTB-2A low-cost 4x4 mini-switcher**

**Video Routing and Distribution**

- **Includes:** Control signal routers/patch panels; Video DAs; Video processing amplifiers; Video routing switchers
- **ADC**
- **952-838-8080; 800-726-4266**
- **UniPatch modular patching system**

**DIGITAL Video and Audio Monitoring**

**Wohler Technologies**

- **Wohler Technologies**
- **650-589-5670; 800-8-WOHLER**
- **MON in-rack LCD video monitors**
- **VAMP series of in-rack LCD video monitors offer SDI, analog and RGB (optional) video inputs. Units available include Quad 4, Triple 5.6" and 4, Dual 6.8", and 7" (16:9/4:3 switchable). The VAMP series provides LCD video plus the quality Wohler audio monitoring, (All units NTSC/PAL auto-sensing).**
Knox Video Technologies
301-840-5935
Kramer Electronics
908-735-0016; 888-275-6311
VS-4228 eight-port RS-422 matrix switcher
Laird Telemedia
800-898-0759
Leightronix
517-694-8000
PRO-16 event controller/switcher
Leitch AgileVision
416-445-9329 ext3482
Leitch

Check out our online Buyers Guide at
www.broadcastengineering.com for
Extended listings and updated company information

Vela
801-464-1690
IDS compact router
Video Accessory
303-443-4950; 800-821-0426
Video Rentals Inc (VRI)
800-255-2874
Videoframe
530-477-7200
Tally Mapper
Videotek
610-327-2292; 800-800-5719
Ward-Beck Systems
416-335-5999; 800-771-2556
Serialboxx rack-mount frame for audio, video analog and digital; 8200 series rack-mount frame
Wiltronix
301-258-7676; 800-848-7870
Video routing and control: SD/HD, analog 4x4 to 1024x1024 Utah Scientific 300 or 400; NVision NV, ENVOY or TS

Video Storage
Includes: Archive/DVD storage; Commercial insertion equipment/software; On-air presentation systems; Still/clip stores; Tape library systems; VDRs (video disk recorders); Video servers; VTRs (videotape recorders)

Accom
650-328-3818
WSD/HD, WSD/HDi, WSD/HDX, WSD/2 Xtreme and Attache DDRs
Adtec Digital
615-256-6619
AJA Video Systems
530-274-2048; 800-251-4224
Alcorn McBride
407-296-5800
Applied Digital
352-328-0516
Adnet Ad insertion system
Arcatron
602-843-2589
Associated Press ENPS
202-736-1100; 800-621-4747
Aston Broadcast Systems
+44 1252 836 221
Avica Technology
310-450-9900
Avica StillStore
Avide Digital
978-640-6785; 800-949-AVID
AirSpace multichannel digital production server
AVS Graphics & Media
801-975-9798
Stillbank still store
BOX Technologies
512-835-0400; 877-877-2699
BUF Technology
858-451-3150
SPOT server management system
Chyron
631-845-2133
Computer Modules
408-946-1881

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Product Directory

Crispin
919-845-7744; 888-577-7913
System 2000 ArchiveManager

Digital Images
651-688-0888
Digital Vision (US)/Digital Vision AB
818-789-8111; +46 8 548 18200

DNF Controls
818-898-3380
2044CL instant-access clip management system

Doremi Labs
818-562-1101
V1-MP2, V1-I, V1-UHD and V1 M-JPEG disk recorders; VT1b2 dual-channel disk recorder

Drastic Technologies
416-255-5636
VWV 2504 DV and MPEG-2 two-channel digital disk recorder; VWV 5000 standard-definition DDR; VWV 7000 uncompressed HDTV DDR

DVC Digital Video Computing GmbH
+49 8152 93010

DVS Digital Video
818-241-8680
HDXWay uncompressed HD server, HDStation Plus uncompressed HD workstation/DDR; SDStationPlus uncompressed SD workstation/DDR

Encoda Systems
303-237-4000
E negro

EVS Broadcast Equipment
972-224-9213
EVS Broadcast Equipment +32 4 362 7000

Fast Forward Video
949-852-8404

Florical Systems
352-372-8326
System L100 entry level commercial insertion

For-A
352-371-1505, 714-894-3311
LDR-200 live disk recorder

Grass Valley Group
530-478-3100, 800-824-5127

Igels
+44 1483 280208

Imagine Products
317-843-0766

Image Mine
519-570-9111; 800-363-3400
E-Clips; E-Clips server

JEMS Data Unlimited
603-896-6319; 800-838-JEMS

JEMINI CobraRAID SCSI-ti-IDE disk array sub-systems

JVC
973-317-5000
BR-DV3000 videotape recorder

Keinle Telecom
818-361-2248

TSS-100A: MPEG2 generator/recorder

Laird Telemedia
800-898-0759

Leightronix
517-694-8000

Leitch
757-548-2300, 800-231-9673

LEI Computer Systems
501-347-2242

MATC0 Inc
408-353-2670; 800-348-1843
MA-600M MPEG2 Video server multi-channel configurable, expandable video server; MA-500M MPEG2 Video server configurable multi-channel video server with fixed storage.

Maxell Corporation of America
201-794-5900; 800-533-2836
DVD-R For Authoring; DVD-R Recordable DVD; DVD-RW Rewritable DVD

Meda Corporation
818-597-7645; 888-BYM-EDEA

Media Concepts
916-252-3600

Motorola Satellite & Broadcast Network Systems
858-404-2933

Nesbit Systems Inc
609-799-5071

Odeletics Broadcast
714-774-2200

AirD Data Library Manager Suite of Solutions

OmniVideo Networks
408-585-5100; 866-861-5690

Media Server System
Options International Inc
615-227-8009

AVICA Still Store: Available in HD, SD or multi-standard; AVICA Motion Store: Captures stills and motion. Available in HD or multi-standard.

Panasonic Broadcast & Television Systems Co.

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AJ-HD SD930 HD-5 multi-format, multi-standard mastering VTR; AJ-HD 150 DVCPRO HD Studio VTR; AJ-HD 950 DVCPRO 50 Studio VTR; AJ-HD/150 HD/SD multi-format DVCPRO Video Server; AJ-SD930 editing VTR

Pinnacle Systems
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Pine Power
561-395-4801

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800 771 2556
Portland Oregon U.S.A.
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613-652-4886

Seachange International
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MediaCluster

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Sony Electronics

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Spencer Technologies
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Storeel Corp
770-456-3280; 888-786-7335
Teklogic, Inc
818-810-3527

Thomson Grass Valley

Vibrant Profile platform
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Profile XP media platform

TGS
540-966-4032; 888-296-5866

Vela
801-464-1600
Media Machine DVD-RAM archiving system

Video Rentals Inc (VRI)
800-255-2874

Videomagnetics
719-390-1313; 800-432-3887

ViewCast
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Vssoft
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Wiltronix
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Zapex Technologies
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AutoPatch
509-235-2636; 800-622-0246

Belden Electronics Division
765-983-2000; 800-BELDEN1

Bescor Video
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Bittree
818-500-8142; 800-500-8142

Broadcast Richardson
630-208-2200; 800-737-6937

Clark Wire & Cable
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Communications Specialties
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Comprehensive Video Group
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DVC Digitalvideo Computing GmbH
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EaglePro Industries
517-796-8800

EASI-Efficient Antenna Systems Inc
841-424-5079; 800-666-9531

Extron Electronics
714-491-1500; 800-833-9876

Gemnum
905-832-2996

Gepco
847-795-9555; 800-966-0069

XB401 extended-bandwidth analog audio cable; S55292F4FC 24-pair digital audio cable

Hosa Technology
714-736-9270

International Fiber Systems
203-426-1180; 800-824-5960

Kings Electronics
803-269-5000; 888-909-5551
Fibre Cam tri-loc; 776X-X-X (Belden 7804B or equivalent)

Kramer Electronics
908-735-0018; 868-275-6311

Lemo USA
707-579-1015; 800-579-4144 x1015

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Signal Transport
949-859-9615

Superior Electric
866-585-4552; 800-787-3532

Teklogic
818-610-3527

Telcast Fiber Systems
508-754-4888

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Teracom Components
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2nd Annual Excellence Awards

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We're proud to present the second annual Broadcast Engineering Engineering Excellence Awards. These awards recognize innovation, quality design and construction of production and broadcast facilities. This year's entries include 34 examples of leading-edge facilities from around the world. From audio to TV to satellite, these facilities represent some of the best work of today's top systems integrators and equipment manufacturers.

Broadcast Engineering readers will help select this year's winners. You are encouraged to review the facilities highlighted here and then go to the Broadcast Engineering Web site and vote for your favorite installations. Go to www.broadcastengineering.com, click on the Engineering Excellence Awards icon and vote for your selections.

When voting, consider how well the systems integrator and facility exhibit the following design and application issues:
• Originality/innovation of new or existing techniques
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Readers win, too!

Readers who vote and then enter their e-mail address will be eligible for a drawing of Broadcast Engineering T-shirts. Only one entry per reader please. To be eligible for the T-shirt you must provide an e-mail address.

Readers can vote until Jan. 20, 2003. The winning facilities will be announced in the March 2003 NAB preview issue of Broadcast Engineering and the Engineering Excellence Awards will be presented to the winners at the NAB convention.

So read, vote and win!

Brad Dick, editorial director
With the broadcast industry continuing its move toward DTV implementation, Syracuse, NY-based WCNY had some vendor and implementation decisions to make – quickly. Faced with a Nov. 1, 2002, deadline to provide a DTV feed to the local cable operator, WCNY made the decision to work with Leitch to implement a turnkey DTV system with Leitch’s AgileVision at the core. In a record four-day installation, commissioning and operator training deployment, WCNY was able to successfully meet its deadlines for a demonstration to its board of directors and for provision of its DTV cable feed.

WCNY needed a system that would allow it to transmit its multiple-channel, standard-definition content from 6 a.m. to 7 p.m., as well as the PBS network’s high-definition feed after 7 p.m. Requirements included local HD logo overlays for branding purposes and storage of off-satellite HD feeds for later playback and branding. The multiple-channel SD content consisted of two feeds from the PBS satellite network feed and one locally generated NTSC feed that was to be MPEG-2/ATSC-encoded and statistically multiplexed with the other SD content. With future plans to encode more local content and originate data broadcasting applications, WCNY needed an extensible platform that would allow expansion in a seamless fashion.

Leitch’s AgileVision system was chosen for its ability to help WCNY achieve its objectives in an operations-friendly and straightforward way. Because the system allows for processing of SD and HD signals while they are still in the MPEG-2 compressed domain (“flow through MPEG-2 master control”), WCNY was able to avoid a costly investment in SD and HD decoders, traditional baseband video master control switchers and routers, MPEG-2 real-time encoders, and re-multiplexing systems. Additionally, given the multiplexed nature of MPEG-2 signals, the station cabling was reduced dramatically in comparison to a traditional baseband system.

With the AgileVision industrial- and defense-grade platform, real-time MPEG-2 encoders and over 1.5TB of storage were integrated natively onto the 9RU rack-mount platform. The combination of flow-through MPEG-2 master control and the integrated nature of the AgileVision system (“DTV in a box”) enabled WCNY to avoid considerable complexity, capital investment and operational expenses, and ultimately accelerated “time to air” on a constrained budget.

Along with the AgileVision system, WCNY deployed the following additional systems in preparation to go on-air with DTV: Leitch’s NEO platform, which includes the 8x1 SDI and HD-SDI NSM-8x1SHD routing switcher, and a Sencore HD decoder with ASI input for monitoring purposes.

Public broadcasting was introduced to central New York on Dec. 20, 1965, when WCNY-TV signed on the air. Today, WCNY operates three FM stations and a 24-hour cable channel in addition to its WCNY-TV station.

Leitch provides design, development and distribution of high-performance audio and video infrastructure to the professional video industry.
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administered by the non-profit corporation known as Denver Educational Broadcasting, KUVO-TV reflects its commitment to cultural diversity. The multicultural programming, outreach and public service are geared to emphasize the Chicano/Hispanic experience. Located at 89.3 on the Denver dial, the station provides healthy doses of Salsa, Latin and Blues music with its core being contemporary and classic jazz.

Known as Denver's "Jazz oasis in the city," the station is one of only nine full-time jazz stations in the nation. While a National Public Radio affiliate for fifteen years, KUVO has grown both in listener support and technologically.

The station has taken the long-standing premise of live jazz being the core of their programming. A bi-monthly offering, Performance Studio, presents jazz artists and trailblazers in live studio performances. From pianist/composer Billy Taylor and the Dirty Dozen Brass Band to the new guard of Medeski Martin and Wood, KUVO is outpaced in sheer number of studio performances only by Boston's WBGO.

Recently, KUVO completed a full digital plant conversion including a Nautel transmitter, Logitek Numix digital consoles, Shiveley antenna, a Harris digital microwave and an Omnia FM Veris processor from Cutting Edge among its major components.

In addition, Neumann microphones have been a significant part of the station's on-air sound for many years, according to Mike Pappas, KUVO's chief engineer. It was on the suggestion of an associate that KUVO tried the KMS 105 for live broadcasts.

Pappas and the KUVO staff were so impressed with the KMS 105 that it soon replaced another industry standard microphone used by their on-air announcers for the past 10 years.

KUVO records all of its live performances via Genex Direct Stream Digital recorder and Midas Venice 320 console. These recordings are compiled into a "best of" compilation CD and are used as premium member donation incentives. Pappas emphasized that the necessary support from national and regional artists is what keeps the station going.

The KUVO commitment to quality programming and on-air sound is reflected in its extensive collection of both Neumann and Sennheiser microphones. Neumann KM 184s find duty on guitars along with M 147s on reed instruments. M 149s are often used on vocalists, while U 87ai's and 105s are used for announcers. TLM 103s are also part of the house microphone complement. As for instruments, the station has used the Neumann KU 100 dummy head to mic drums and has been delighted with the results. Other Sennheiser mics include five of the recently introduced MKH 800s, MKH 20s on drum overheads and MKH 60s on saxophones. Sennheiser HD 25 and HMD 25 headphones are used extensively for studio monitoring and live remotes. In the pursuit of the natural and open sound characteristic of the world's best jazz recordings, the station does not use limiters or compression on their live recordings. Preamps, however, play a significant part and are all designed by Mike Grace.

While having this arsenal of Neumann and Sennheiser microphones stretches the budget of the non-profit station, Pappas pointed out that no other microphones provide the level of performance and reliability both the station and the artists demand.
PSP-TV Channel 2 set aggressive goals from its very inception, and Sundance Digital has been instrumental in helping to reach them. When the station in Palm Springs, CA, made the decision to go from start-up to full CBS affiliate in less than six months, Sundance, along with systems integrator Digital Systems Technology, based in Irwindale, CA, was able to ensure that it met its aggressive Sept. 2, 2002, deadline to go on-air.

KPSP management knew that while time was a heavy factor, allowances could not be made for reliability or quality because viewers' positive first impressions of the new station would be critical to its early ratings success. As such, the choice of Sundance Digital's FastBreak automation, a robust, scalable and frame-accurate controller of video servers and other station peripherals, played a key role in ensuring that the station's initial on-air look would be the best it could be. Furthermore, choosing FastBreak early in the planning stages helped the design team flesh out the rest of the station's technical backbone.

This was the first installation of FastBreak Automation with the new Thomson Grass Valley Profile in its Media Area Network (MAN) configuration. The system has two ingest stations – one in master control and the other in the traffic department. It uses one main Air Station and one ListSync, a redundant backup for the primary Air Station, along with an Intelli-Sat feed scheduling and record system. The various elements are connected to a central SQL database, assuring a smooth workflow from ingest to playout.

As currently configured at KPSP, FastBreak controls two Profiles with a total of 12 channels. However, should KPSP find it necessary to expand the system, it can be upgraded by simply adding workstations for ingest and play-to-air.

Also included in the KPSP setup is Sundance’s MediaCacher, which interfaces with FastBreak to efficiently and automatically cache content from tape to the video server.

KPSP was a greenfield installation: The building, equipment – and the people – were all new. To ensure that KPSP’s staff would be comfortable with the automation system when the time came to go on-air, Sundance Digital engineers went on site for the initial commissioning and operator training long before the station’s air date, and even returned for additional brush-ups and last-minute training during the week KPSP went on-air.

With the help of Sundance Digital and Digital Systems Technology, KPSP hit its deadline and is now a full-service CBS affiliate broadcasting a full slate of network programming, including CBS’s NFL football package, as well as four hours of daily local news and arts/entertainment programming.

Sundance Digital is a provider of cost-effective, high-performance broadcast automation solutions, based in the metropolitan Dallas area.

**Design Team**
* Sundance Digital:
  * Robert C. Johnson, president
  * Eric Harrington, director of engineering
  * David Gray, chief engineer, KPSP

* Digital Systems Technology:
  * Dwight Crumb, vice president of engineering
  * Ken Stanton, project manager/logistics
  * Janet Crumb, project manager/crew
  * Andre Pappas, CAD designer

**Equipment List**
* Sundance Digital FastBreak automation
* Sundance Digital ListSync
* Sundance Digital Intelli-Sat
* Thomson Grass Valley Profile servers
The NBC hub-spoke project features three hubs, 13 spokes and service in seven of the top ten markets. The NBC Television Station Division has led the way into the future of TV broadcast operations by demonstrating that substantial savings in operational costs can be achieved using a centralized business model, while still maintaining the localized flavor and content necessary for the highest possible market ratings. The success of the hub-spoke project has led NBC to schedule expansion of the system, adding KNTV, San Jose and multiple Telemundo stations to the system.

NBC carefully studied the viability of centralcasting to streamline operations and reduce capital expenses. Operational savings resulted from maximizing staff efficiency and streamlining the material workflow. Capital expense savings occurred because only three new hub facilities had to be equipped with digital equipment instead of each of the spokes.

After researching available automation solutions, NBC chose Florical ShareCasting because it easily controls equipment spread out across multiple sites (the hub and each spoke) as one cohesive system, yet allows for easy local control for breaking news stories. Florical also provided superior reliability by deploying two separate fully independent systems, so if one system fails (due to multiple system failures), the other independent system is right there in step for immediate protection.

At the NBC hub sites in New York, Los Angeles and Miami, the Florical ShareCasting originates all programming and commercial breaks for the individual TV stations. Content is stored in two separate Thomson Grass Valley Media Area Network (MAN) storage arrays for redundancy protection. The individual program streams are transmitted to the spokes using E2V Technologies (formerly Marconi) ASX-1000 and ASX-200BX broadband switches for passthrough to the transmitter, as is done in traditional centralcasting.

Unlike traditional centralcasting, the Florical ShareCasting solution enables the NBC spoke stations to share control and sourcing with the central hub. At the spokes, late-arriving commercials and local promotions are stored on a local video server using the MediaFiler media preparation system and are inserted into the program stream using a local routing switcher under automation control from the hub.

The ShareCasting Multi-Time Zone software enables all schedules to run from the hub in their own local times while the control software executes time-based commands to video servers and switchers based on Universal Coordinated Time.

AirBoss Editor Workstations add or drop material from commercial breaks during newscasts or breaking news cut-ins from the studio control room or the newsroom at the local station. ShareCasting’s Zero Timing software provides programming flexibility by seamlessly mixing material from the hub and spoke within the same break.
When Tom Long, Jr., director of engineering at WHKY, began planning for the station's transition to digital broadcasting, he wanted a solution that utilized the existing broadcast tower, and he needed to replace WHKY's older NTSC antenna. He'd thought about a pair of side-mount antennas but was concerned about the weight and exceeding the tower's windload. He contacted Andrew’s broadcast division about their TRASAR traveling wave antenna.

Fortunately, Andrew was developing a lighter weight, lower windload TRASAR model, the TRASAR LT, which offered the same high performance and advanced design technology as the original. When Long called, the TRASAR LT was still on the drawing board, but Andrew worked with WHKY-TV to deliver a swift solution, and the new antenna was installed in July 2001.

The TRASAR LT antenna solved the problem of poor reception and limited coverage of households in the densely populated Charlotte broadcast area. Combining over-air and cable, WHKY-TV now reaches 715,000 households and 1.7 million people.

Along with the TRASAR LT, Andrew also installed a second antenna for WHKY-TV, a side-mount ALP antenna for high-definition broadcasting on digital Channel 40, WHKY-DT. Long said that installing both antennas at the same time enabled them to minimize downtime and take their first step in the transition from analog to digital broadcasting. WHKY-DT’s digital antenna went on-air on April 6, 2002.

Long noted that despite optimistic estimations, all-digital broadcasting isn’t likely to be the norm until 2020 or 2030, so it was important for WHKY-TV to have an upgrade solution to meet both analog and digital requirements in the future. He said that he anticipated WHKY-TV would still be operating their analog facility for many years to come, which is why they invested in the TRASAR LT antenna.

The antennas were installed back-to-back, so WHKY-TV was able to realize significant cost savings by using its existing tower without compromising weight and windload restrictions. Andrew engineers used proprietary modeling software to create a peanut-shaped pattern for each antenna with built-in nulls to prevent interference between antennas and the mast. In addition, the use of Andrew HELIAX high-performance coaxial transmission line to feed the ALP digital antenna proved to be a cost-effective solution. According to Long, the decision to use HELIAX cable reduced the cost of installation by 50 percent.

With its expanded bandwidth, WHKY-TV is now well positioned to respond to future broadcasting requirements and the programming needs of its viewers.

### Design Team

**WHKY:**
- Tom Long, Jr., director of engineering
- Tom Long, Sr., general manager
- Jeff Long, station manager

**Andrew:**
- Scott Martin, senior product line manager
- Jim Heard, account manager, broadcast/satellite systems

### Equipment List

- TRASAR LT antenna
- HELIAX transmission line
- ALP antenna

**WHKY-TV**

52 broadcastengineering.com Advertising Showcase DECEMBER 2002
CanWest Global Communications is an international media company that serves as Canada's largest publisher of daily newspapers, and owns, operates and/or holds substantial interests in newspapers, conventional television, out-of-home advertising, specialty cable channels, radio networks and Internet portals in Canada, New Zealand, Australia, Ireland and the United Kingdom. Fireworks, the company's program, production and distribution division, operates in several countries throughout the world.

CanWest Global Toronto's main audio control room recently underwent a significant expansion as part of a larger project to enhance the organization's live news capabilities. Global News' strong commitment to live news quickly determined that a stronger audio console was needed to support the growth.

CanWest Global's operations and engineering were challenged with replacing a dated analog board to accommodate the increased requirements and anticipate the growth of news services including a morning show and increased network responsibility. A Wheatstone TV-80 audio console was selected, bringing the number of Wheatstone consoles purchased by CanWest Global to five.

Challenges included limited time and space allocation. Additionally, the major market broadcaster had to remain on-air during construction, which was achieved with a side-by-side temporary console while the old one was removed. The cutover had to be seamless, thus an unusual and effective strategy was formulated. Using Styrofoam and cardboard, the staging department fabricated a duplicate control room, including equipment.

The console was placed in the "mock" studio so operators could train in a realistic environment, familiarize themselves, address operational issues and minimize the learning curve prior to going live. The "mock" environment also afforded the opportunity to maximize the design of the room and perfect the layout before anything was bolted down and wired in the new studio.

The TV-80's dedicated IFB mix-minus busses were very attractive features for the significant increase in live news production. The upgrade resulted in a huge live news element including a helicopter, microwave trucks, satellite trucks and fiber hook-ups. Six to 10 live remotes are now produced in each half-hour program, and the TV-80's ample mix-minuses give reporters the ability to communicate with the station, as well as hear each other. This feature strengthens the reporters' participation in the newscast, which is an invaluable tool for a news-intensive broadcaster in the highly competitive Toronto market.

The TV-80 offers a true broadcast console that offers a sturdy mechanical design without crowded space issues. The console is extremely operator-friendly and has lived up to expectations.

**Design Team**

*Jim Peck, Wheatstone*

*CanWest Global:*

*Bob Burns, director of technical services*

*John McEwen, technical producer*

*Henry Brown, chief audio operator*

*Mark Walewski, manager of engineering facilities and planning*

**Equipment List**

*Wheatstone TV-80*

*AVP Bantam audio patch panel utilizing over 500 jacks*

*RTS/Telex telephone interfaces*

*Stereo DBX compressors*

*760 Tektronix audio monitor and Tannoy speakers with Hafler power amplifiers*
Univision Communications, with its rapidly growing Hispanic market, expanded its operation with the purchase of the USA station group and the launch of the Telefutura Network. Telefutura contracted The Systems Group (TSG) to design and integrate their Miami broadcast operations center (BOC) within an eight-month window. The new BOC creates and distributes media to Telefutura’s 42 station groups (23 owned-and-operated stations and 19 affiliates) across 27 markets nationwide.

To compile programming to support 24-hour broadcast, the Telefutura facility required extensive post-production and graphic generation capabilities. The post-production area was comprised of linear edit rooms, nonlinear edit rooms, graphics rooms, voice-over rooms and an audio post-production room. The linear rooms were outfitted with 12-input Snell & Wilcox Magic Dave switchers, a two-channel Chyron character generator, a Sony BVE 2000 edit controller, Videotek color corrector and Sony Digital Betacam tape decks. The nonlinear edit rooms utilized four Avid nonlinear systems with a Yamaha 02r audio console and local audio sources. The graphic rooms were powered by Macintosh G4 computers containing varied graphics programming. Nonlinear-based post-production rooms contained local media storage and were able to share media files via Avid’s Unity file server system.

Operationally, a highly efficient workflow model was created. After elements are put together in the post-production support area, the media is transferred to one of the four media preparation/acquisition stations, which were designed to perform high-resolution ingest to the file server, playlist compilation, color correction, captioning insertion and the creation of a tape backup. Some of the support gear includes an Nvision AES subframe router to allow for individual AES channel manipulation, and Snell & Wilcox CPP-100 SDI noise reducers/MPEG pre-processors. Once the media is reviewed and ingested it becomes available for integration into the automation playout list. Three respective time zones are driven by a dedicated playout list with each zone switched through a Thomson Grass Valley M2100 master control switcher configured with two channels of AES audio. The air path was designed with a highly redundant architecture, with each playout path utilizing a pair of Thomson Grass Valley XP video servers for main and redundant video playback to assure minimal downtime.

The technical areas of ingest, post production, media prep and master control were designed with maximum flexibility. The internal audio and video routing systems allow plant operators to share media resources quickly and efficiently. Through diligent planning and proper equipment selection, an extremely flexible and cost-effective BOC was produced using prevailing technologies.

**Design Team**

Telefutura:
- Fernando Portela, director of engineering
- Jose Boveda, vice president of engineering and broadcast technology
- Cisco Suarez, director of operations

The Systems Group:
- Joseph Policastro, project manager
- Adam Semcken, senior project engineer
- Greg Williams, integration supervisor
- John Vasilenko, project coordinator
- Eric James, senior associate, Gensler

**Equipment List**

Thomson Grass Valley:
- SMS7500WB video router
- SMS7500NB audio router
- SMS7000 analog audio router
- PVS1024 Profile XP video server
- M2100 master control system
- Harris automation
West Long Branch, NJ’s Monmouth University faced a decision in 1999 about what to do with its campus television and radio broadcast facilities. At the time, the radio and TV stations operated out of separate buildings, and both facilities were in desperate need of improvements.

In response, the university decided to construct a new multipurpose facility, which would bring the television and radio studios together under one roof and provide necessary upgrades. Today it’s called the Jules L. Plangere Jr. Center for Communication and Instructional Technology (CCIT) Building, a new, state-of-the-art, educational broadcast facility that opened this school year to returning students.

Monmouth’s most important objective was to create an environment that was first and foremost an educational facility, while at the same time functioning as a full-service television facility in its own right.

The hub of the CCIT television facility is the master control room. This room features a custom master control console designed by Harris. The hub also includes a Panasonic DVCPRO studio editing VTR with digital still and slow-motion playback and high-speed 60x search, and one 14-inch and two eight-inch Sony monitors with rack-mounts.

The production room features a Ross Synergy 1 digital production switcher with 16 digital inputs, 100-event memory and chroma keying.

The production room also includes a Chyron Duet LE character generator and a Harris custom-designed production control console, which includes TD, producer, audio desk, audio rack and 6RU turret to match.

Another distinctive feature of the CCIT Building is that there are 18 remote locations throughout the building where students can go “live” and broadcast back to the master control room.

Among these in-house remote locations is an area known as the “videowall.” Designed to be used for the studio’s entertainment report, the videowall consists of nine, 42-inch NEC plasma flat screens. The wall is both PC- and video signal-compatible and connects with a JBL two-way powered speaker system.

Each of the rooms in the television studio also features Harris custom-built furniture and consoles designed at the Harris Pacific Design Center in California and built at Harris’ Cincinnati facility. The furniture is created with flexibility, durability and style in mind.

To fulfill the project vision set out by the university, the Harris, Einhorn Yaffee Prescott and Costello Maione Schuch teams had to focus continually on tight timetables, unsurpassed product quality, workmanship, maintainability and effective documentation. The result is a facility that will be an educational resource for many years to come.
Kaleido-K2 ‘Virtual’ Monitor Wall Processor

The Kaleido-K2 multi-image display system redefines signal monitoring by incorporating all conceivable monitor wall features in a single display. Kaleido-K2 turns any standard computer, projection or plasma display into a complete “glass cockpit” for your TV control room or monitoring center.

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Miranda
THINK PURPLE
WHRO, the community-liscensed public broadcasting station in Norfolk, VA, for over 40 years, wanted to take advantage of one of the most important and under-utilized features of digital television – the ability to dynamically change the nature of the ATSC transmission and channel mix to suit the time of day. Their new master control and technical plant originates 12 channels including a five-channel HD/SD ATSC multiplex. WHRO wanted to provide high-quality, HD television during prime time, and provide multiple standard-definition and datacasting services for targeted audiences during the rest of the day.

Among the facility's many innovations are those included to allow the dynamic reconfiguration of the DTV multiplex. Considerations had to be taken to make sure receivers and the viewing audience would not be confused by the dynamic changes in the multiplex.

During the day while WHRO broadcasts four channels of SD programming and datacasting, the HDTV program is not turned off. Instead, the HDTV channel transmits still images and graphics promoting the HD service and providing details of the evening's program schedule. Statistical multiplexing is used to combine the desired full-motion programming with low-bandwidth "barker" channels in a single ATSC transport stream.

At night, when the HD and one of the SD channels transmit full-motion video, the other SD channels are maintained and transmit information pages. WHRO teamed with Communications Engineering Inc. (CEI) of Newington, VA, who designed and installed the new facility.

The choice of equipment vendors centered around the flexibility and dynamic reconfiguration of the DTV multiplex. In the master control room the key elements were presentation switching/branding and monitor wall solutions capable of handling multiple channels from a single operator position. For on-air presentation WHRO selected the Miranda Oxtel series under control of Harris automation. For the monitor wall WHRO built a dual-display virtual monitor wall capable of displaying up to 12 SD and six HD signals using Miranda Kaleido processors into two Clarity Lion uXGA cubes. The ability to simultaneously display 4:3 analog, 16:9 SD and HD sources and dynamically reconfigure the monitor wall when the DTV mix is changed were key. Miranda iControl system management software performs supervision, alarm reporting and error logging of key system elements.

WHRO is presently broadcasting the five-channel ATSC transport. Its challenge now is to fine-tune both the encoding rates for the placeholder graphics and the full-motion video to maximize the quality of the signal that reaches the home.

Design Team
WHRO:
Keith Massie, vice president, operations
Bob Boone, chief engineer
CEI:
Raef Alkhayat, senior project manager
David Giblin, vice president/GM
David Horowitz, television consultant

Equipment List
Miranda Imagastore channel branding and Presmaster master control
Miranda Kaleido-K2 multi-image processor into Clarity Lion uXGA cubes
Harris automation
Omneon video server
Sony Petasite archive system
Sencore ASI server
Thomson Trinix router
Miranda Densit+e distribution amps
Miranda Imaging video interfaces
Miranda iControl system management
Harmonic DTV encoders and stat mux
Cisco Systems has added a complete broadcast and production facility to its San Jose, CA, headquarters. Designated as Building 8 in its complex, the facility is a completely new structure built from the ground up.

Digital System Technology (DST) was contracted as systems integrator for the facility and provided a full range of services including the design, consulting, engineering, equipment provision, integration and installation for a master control center, four broadcast control rooms, four production studios and several labs.

Cisco's need for the facility was twofold: as a marketing platform for its IP/TV solution line - a comprehensive network video streaming system for businesses, schools and government organizations; and for internal training purposes.

Here, Cisco has the capability to train clients, employees and customers worldwide, via multicast and unicast streaming, at a much lower cost than flying trainees to San Jose from all over the world. This results in enormous cost savings for Cisco.

The heart of the system is rooted in the master control center, a 20x20-foot room that features 10 racks of equipment that tie together all operational aspects of the facility. To ensure that all required equipment would fit into the available space, DST designed exceptionally high racks to house the equipment. The primary core consists of PESA Tiger and Cougar routing and switching systems, which address SDI and NTSC video, plus AES and analog audio.

Each of the four broadcast control rooms (A, B, C and D) has its own adjacent production studio. Control A, at 20x20 feet, is the largest of the four control rooms, with an adjacent 35x45-foot production studio - also the largest of the four production rooms. As the facility's primary control room, Control A features a large Sony DVS-7150 production switcher as the centerpiece of the room amongst an assortment of production equipment from Pinnacle Systems.

The remaining three control rooms feature the same equipment, though Ross 210D production switchers were installed instead of the Sony switcher.

The adjacent production studios to Control B, C and D are roughly half the size of Control A's production studio, at 18x20 feet each. Generally, all four production studios feature similar equipment: Sony DXC-D35WT cameras with Fujinon Ah18x9.7 standard-definition lenses, with each room featuring multi-camera setups. Featured throughout the entire facility for communication purposes are numerous Sennheiser audio products.

The final leg of the integration process included two labs for equipment testing and training: one for the IP/TV solution line and one for Cisco's training development. DST installed a termination panel that allows for the movement of equipment into the labs as required. The labs themselves connect to various studios and production rooms for content creation that is later distributed via the Internet or recorded directly to tape.

**Equipment List**

- PESA Tiger and Cougar routers
- Pinnacle Systems DVEXtreme digital effects systems
- Ross 210D production switchers
- Sony DVS-7150 production switcher
- Sony DXC-D35WT cameras
- Fujinon Ah18x9.7 standard-definition lenses
- Sennheiser EM 1046 and EM 3032 rack-mount receivers
- Crest VX audio console
- Cisco IP/TV 3425, 3424 and 3432 for multicast and unicast streaming
KICU-TV, an independent station previously operating in its own San Jose, CA, facility, was recently relocated to KTVU-TV in Oakland to create a dual-station master control center. KTVU, a FOX affiliate, now operates along with KICU under one roof on a 24-hour dual-station operation schedule.

Digital System Technology (DST) served as systems integrator for the project, intended to maximize efficiency in local operations for Cox Broadcasting. The design criteria also called for multiple streams out of master control to accommodate future multicasting and centralcasting scenarios.

DST selected and specified the equipment for the project in a joint effort with KTVU to create an equipment package that met the needs of the expanded facility, as well as one that functioned properly with existing solutions. Three Thomson Grass Valley M2100 switchers serve as the heart of the dual master control center. The facility was designed as an N+1, which translates to the number of stations within the facility plus one backup for full redundancy. With both stations under one roof, the cost of backup equipment is halved, as the stations share the backup switcher.

The monitor layout of the master control center is the visual cornerstone of the room. Ken Manley, KTVU/KICU’s director of engineering, developed the idea to use high-quality, 1080i HDTV-ready consumer televisions for the monitor wall and feed them with Evertz Quattro units to generate native HD resolution quad split displays. A layout of 12, 32-inch flat-face monitors provides the master control with a futuristic look.

However, what turned out to be arguably the most unique aspect of the facility also proved to be the most challenging. The monitors, though advertised as 1080i, appear to be 960i models (480p doubled). This displays a true 1080i signal in the 960i format, cutting off the top and bottom 60 lines of the image and losing 12 percent of the image.

The Evertz Quattro system, featuring a 7765AVM-4 SDI monitoring card to increase monitoring capacity, was initially designed to simultaneously accept and analyze four SDI signals with embedded audio, and provide one 1080i output. However, as the monitors appeared to be 960i, Evertz created custom 960i software for the monitors on only two days notice.

To further fail-proof on-air operations, a Leitch 16x16 switcher is situated at the point of final output. The signals generated from the M2100s are fed via the Leitch switcher into the on-air paths. Four different versions of each program stream were designed so the stations could feed the most suitable version of their programs to six various satellite and cable companies, as well as to their television transmitters (NTSC and DTV). In the very unlikely event that all three M2100s would fail simultaneously, sources can be routed directly to the Leitch switcher and put on the air for uninterrupted programming.

Design Team
DST:
- Lan Merrill, lead project manager
- Dwight Crumb, design engineer
- Bill Hodson, project manager/lead installer

KTVU:
- Ken Manley, director of engineering
- Jim Wagner, technical services supervisor
- Ed Cosci, director of technical operations

Equipment List:
- Evertz 7765AVM-4 SDI monitoring card
- Evertz 8085 CC translator
- Grass Valley Group M2100 switchers
- Leitch RCP-16x16 routing system
- Leitch 16x8VA2 ingest router
- Leitch DPS475 frame synchronizers
On the Road to DTV
Which direction should you choose?

You need a DTV transmitter - but who can you trust to help you select the best system for your needs? Start by contacting Axcera - the RF Experts™. Unlike manufacturers with limited product lines, we won't tell you what to buy - we'll help you to decide. After all, the direction you take should be what's best for you, not your supplier. At Axcera, meeting your needs is our primary focus.

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WEWS-DT is one of 10 television stations owned and operated by the E.W. Scripps Company. Early in the DTV transition, Scripps made a decision to convert all of its stations to full-power digital as quickly as possible. Thanks to the Scripps Corporate commitment, WEWS-DT began operation on Sept. 4, 1999, despite the fact that the station was not required by the FCC to begin operation until Nov. 1 of the same year. The goal was to be an aggressive market leader and a flagship affiliate in digital television by airing all the ABC "Monday Night Football" games in HDTV in the 1999-2000 season.

At NAB2000 an ad-hoc committee of Scripps engineering managers reviewed the state-of-the-art transmitter offerings for future group purchases. After a detailed review of all major manufacturers, a consensus determined that Axcera had the most to offer in an expanding digital television market.

WEWS-DT received construction permit approval for a power increase to 870KW and ordered their 50KW average power Visionary DT series transmitter from Axcera in November 2001 for a January 2002 delivery. They also requested an authorization from the FCC to take WEWS-DT off the air for up to 30 days during the conversion. In order to minimize the off-air time of their digital signal, they began removal of the existing transmitter system to prepare for the arrival of the new system. There was a substantial amount of work required to complete the conversion.

Since the previous DTV transmitter was a single tube unit, the output RF system was simple. However, in order to achieve their full licensed power, it was necessary to install a dual-tube transmitter with a large waveguide system to combine the output of both tubes. As a result, it was necessary to reinforce the ceiling of the transmitter room in order to support the additional weight of the combiner system. To achieve this, they added a rolled-steel beam to the ceiling along with large steel plates to distribute the weight across the ceiling.

Additionally, with ceiling space constraints they were not able to hang a standard combiner/filter combination horizontally, so Axcera took advantage of the ceiling height and provided an e-plane RF system to meet this challenge. This type of RF system is configured vertically, rather than the more typical h-plane or horizontally configured system, so it worked well for their application.

Once the room was prepared, the Axcera service team began installation of the new transmitter system, which was on the air at full licensed power by March 1, 2002.

WEWS-DT was fortunate to have received digital allocation of Channel 15 as it is low in the UHF band and, therefore, provides the best coverage. Additionally, since it is not the lowest channel in the band, lower-sideband interference issues that plague Channel 14 allocations are avoided. The digital coverage is excellent, well beyond the five county areas covered by their analog signal.

The 50KW Axcera transmitter and the slotted UHF antenna at 800 feet on the tower perform exceptionally. They have received signal reports from as far away as Delaware County, OH, to the south and Toronto, Canada, to the north.

Design Team

WEWS-DT:

John Workman, director of engineering
Jim Baird, engineering manager
Ric Harris, general manager
Mike Doback, Scripps corporate director of engineering

Axcera:

Don "Maxx" Thomas, Sr., field service engineer
Kevin Wible, test engineer
Jeff Heldman, applications engineer
Paul Grzebik, regional sales manager
The European Broadcasting Union, based in Geneva, Switzerland, decided in early 2001 to move from its long-time Washington bureau down the street to a building with more space appropriate for building a hub facility where all EBU members could cluster their unilateral facilities around the EBU, which would act as a central ingest and distribution for coverage of U.S.-based news for EBU members. The building was picked a scant five months before the move would begin, which required fast-tracking the design of the space and parallel design of the system needed to support multiple broadcasters.

AZCAR was selected to complete the design and installation. AZCAR designed a flexible, all-digital transmission system centered around one of the first installations of the GVG Thomson Concerto routing system under Encore control. The control system also is interfaced over the EBU’s WAN circuits to EBU’s Thomson Venus router in New York. Monitoring in the new facility makes use of a strategy of using virtual monitor wall processors (Miranda Kaleido) and VBrick video over IP to deliver signals from any portion of the facility to the desks of producers and transmission coordinators.

After a review of available editing solutions, EBU chose Leitch NewsFlash as the house standard and AZCAR prepared a system that would permit content to be recorded to servers where it would be instantly available to editing stations. Control of the ingest is done from production coordinator’s desks and a central control area using networked computers and displays switched in a computer display router. By using this strategy the facility permits a minimum staffing level while maintaining the ability to control up to 16 outgoing feeds at the same time during peak news demand times. During special events the facility can be expandable on a temporary basis to handle any number of simultaneous outgoing feeds and the recording of multiple signals.

The facility also includes two small studios suitable for live or taped feeds. In these studios, each equipped with Ross chroma keyers, journalists can do live shots to Europe, or complete tops and tails for stories in progress. A remote-controlled “beauty shot” camera was installed across Washington for use as a live key background instead of using fixed artwork.

Immediately after the initial installation began, a national tragedy became an instant ramp up in need, when the Sept. 11 attacks required the installation of temporary expansion to handle a crush of literally thousands of unilateral transmissions to countries across Europe. The studios, editing and transmission capabilities were pressed to the limit and found to be a huge success.

**Design Team**

- Tony Naets, head of news, EBU Geneva
- Olivier Hinnewinkle, bureau chief
- Bill Headline, project manager
- Jay Hahn, project engineer
- AZCAR USA:
  - Russ Rockwell, project engineer
  - Marty Skoff, installation supervisor

**Equipment List**

- Leitch NewsFlash news editing stations
- Leitch VR440 server system (12 channels)
- Thomson Grass Valley Concerto routing system
- Thomson Grass Valley Encore control system
- Miranda Kaleido G-2 virtual display processor
- Panasonic plasma displays
- VBrick video over IP system
- Leitch DPS-475AV frame synchronizers
- Ross CDK 104 mixer keyers
- Panasonic studio cameras
- Brightline studio lighting
KASN-TV in Little Rock, AR, recently made the decision to replace their PYE TVT analog transmitter in conjunction with the installation of a digital transmitter for KASN-DT. Their decision was based on several factors. First, obtaining repair parts for the PYE transmitter was becoming increasingly difficult. Second, the transmitter was very energy inefficient. In addition, it was unstable and needed constant attention. As well, the design called for using a common Andrew top-mount antenna for their analog Channel 38 and digital Channel 39. And finally, the N+1 situation with the old transmitter was not attractive.

The facility was dealing with an N+1 situation. The analog station was 5MW ERP, with an antenna input of 92KW, and the digital station was maximized at 1MW, with an input power of 19.1KW.

The engineering staff felt that their existing building was large enough to accommodate both an analog and digital transmitter once the old transmitter was gone for two reasons. First, the existing PYE was actually two transmitters running in tandem, which resulted in a large physical footprint. Second, the newer IOT transmitters were significantly more compact. The transmitter building was also remodeled and a covered concrete pad was added for the heat exchangers.

Some of the difficulties that the engineering staff faced included maintaining an on-air operation with the old transmitter while remodeling the existing building, adding an RF system and the installation of the analog transmitter.

Some of the innovations that were implemented in the new design included the N+1 system, new RF plumbing in the interior, a combined Channel 38 and Channel 39 top-mount antenna, and successful reuse of existing Andrew circular waveguide, which was broadbanded from the original Channel 38 to accommodate both channels 38 and 39.

The architectural considerations included a remodel of the existing concrete block structure, an addition of structural steel to support the interior RF system, the addition of a 20x30 covered area for heat exchangers and beam supplies for both buildings, and re-work of the existing HVAC system and re-routed ductwork.

Ai (formerly Acrodyne) served as the key vendor on the project, and they successfully met the goals that were outlined by the engineering staff and station.

The facility more than met its goals, and the stations are successfully on the air with new analog and N+1 digital. They have radically lowered the cost of their utility bills as compared with the old PYE transmitter. In addition, the on-air quality of analog has been much improved.
The XM Satellite Radio System

The XM Satellite Radio broadcast complex in Washington, DC, is a new concept in broadcast facility building, operations and control. The facility serves as the corporate headquarters for XM Satellite Radio, America’s first national satellite radio service. From this broadcast complex—the largest all-digital radio facility in the United States—XM beams 101 channels of music, news, sports and talk programming to customers coast-to-coast.

Following substantial planning and research, XM selected a building in Washington, DC, that provided a large, raw space that could be transformed into a technologically advanced broadcast center. Though built in 1896, the all-brick building proved structurally sound and easily accessible from nearby Maryland, Virginia and the District of Columbia.

The 150,000-square-foot XM facility is equipped with 82 end-to-end fiber optic, all-digital radio studios and a large performance studio. Independent suspended studios with four-inch-thick, steel-clad structural panels seal out intrusive noise to provide complete acoustic isolation without compromising sound quality. Fiber optics and computer servers enable XM to produce digital-quality sound across all 101 channels.

Two satellite dishes transmit programming to XM’s orbiting satellites, “XM Rock” and “XM Roll,” and the XM signal is then beamed to cars and homes across the country.

The studio design criteria required that the building be multi-functional, with studios of all configurations, as well as office space for more than 300 XM employees. XM’s technical facility is comprised of a technical operations center (TOC), a broadcast operations center (BOC) and a network operations center (NOC), which together sustain the mix of radio programming, technology and satellite control needed to offer continuous digital-quality radio.

XM’s operations and broadcast engineering team acted as systems integrator on the project, working with vendors and manufacturers in planning and building the facility. Modular and computer-aided design enabled planning of the entire facility before any physical construction began.

Because the buildout and technical infrastructure had to be completed in fewer than 12 months to meet XM’s targeted on-air date, XM utilized modular studio construction to ensure on-time completion and consistent, repeatable acoustic performance from studio to studio.

XM combined key disciplines not traditionally used in radio. Among XM’s innovations is the use of a large-scale automation system. Encoda Systems’ Paradigm suite manages all of XM’s audio channels and satellite uplink parameters. Encoda Systems’ Channel Manager D-Series communicates to the Klotz digital audio routing matrix while interfacing each of more than 200 digital audio playback devices with each studio and remote origination source.

Each week, XM broadcasts more than 1500 hours of live programming, hosts artists and musicians from around the globe, and often serves as a venue for local community and government events.

Design Team
XM Satellite Radio:
Tony Masiello
vice president, operations
Ed Schwartz
director of broadcast engineering
Jaime Colon
manager of broadcast systems
Eric Hoehn
manager of broadcast operations center

Design Team
XM Satellite Radio:
Tony Masiello
vice president, operations
Ed Schwartz
director of broadcast engineering
Jaime Colon
manager of broadcast systems
Eric Hoehn
manager of broadcast operations center
As part of its ongoing upgrade to an expanded, purely digital facility, CNN International sought a redesigned master control system to better facilitate regionalization, as well as accommodate its complex, ever-changing requirements. To this end, CNN International selected Leitch to provide five Opus master control switchers that, when used together with the Leitch Integrator router and Leitch VR server technology, provide a central control over video routing and server playback.

The central design criteria of the new CNNi facility mandated a flexible system that would allow for the origination of seven CNN International networks in a live news environment. CNNi required that any pod (network) must be able to control and view any of the other networks. Each pod needed to be the same design, as the staff of 33 master control operators each handle different regions in the room, and the pod similarity would make it easier to move staff around without concerns about workflow and equipment disruptions.

The Leitch equipment was chosen primarily because of its advanced architecture, the ability to network up to 16 Opus master control switchers together (each can be controlled and monitored at any other pod) and its easy upgrade to high definition. Furthermore, the addition of more networks to the pod system is very simple. These network architectural modifications necessitated CNNi's expansion of its existing space, including the demolition of a bank. Acoustical requirements dictated that the noise generated by the monitoring of all the independent networks must be limited, which led CNNi to go with an audio localizer sound dome to limit the amount of noise in the room.

CNNi now has consistent operational workflow at each pod and the ability to reconfigure monitoring at a pod based on what regions the operator is managing. The facility has proved to be easily expandable, in terms of adding regions, monitoring, additional sources, etc. The master control staff now has the tools it needs to effectively monitor both the quality of the feed and the commercial and programming content. Streamlining the pods has improved performance amongst the staff, as there is not a different learning curve for each individual region. Overall, CNNi's workflow consistency has improved significantly since the implementation of the redesigned master control.

CNN, a division of Turner Broadcasting System, an AOL Time Warner Company, is a respected and trusted source for news and information.

Leitch's Opus master control switcher includes 8:4:4 video processing and features eight channels of audio at 24-bit resolution.

**Design Team**

**CNN International:**
- Bob Hesskamp, senior vice president, CNN News Group operations
- Anne Woodward, director, technical operations
- Dave Silver, engineering director
- Matthew Holcombe, engineering manager

**Leitch:**
- Geoff Snell, product manager
- Greg Weot, regional sales manager
- Sim Kolliner, applications engineering manager

**Equipment List**

- Leitch Opus master control switchers
- Leitch integrator router
- Leitch LogoMotion
- Leitch 16x1 digital clean switch
- Leitch conversion equipment
- Snell & Wilcox conversion and standards conversion equipment
This year marked another notch in the successful launch of digital television as WWSB began broadcasts from its new, all-component digital facility in Sarasota, FL. For the Channel 40, ABC affiliate, this transition was its most technically sophisticated undertaking since WWSB began in 1971 as WXLT.

With over 23,000 square feet, WWSB, along with system integrator A.F. Associates, designed a completely server-based and fully automated installation that exemplifies the concepts of collaborative production and shared storage. WWSB's infrastructure has the Omneon Media Server as the core storage and networking platform, using installed partner applications from Sundance Digital and Pinnacle's Liquid purple.

From ingest through editing and transmission, WWSB's single, centralized system has optimized the facility's overall workflow. With the Omneon server as the repository for an all-digital library of high quality content, they have eliminated unnecessary encoding and decoding steps in the production process.

By minimizing the physical handling of content and increasing the infrastructure's reliability, WWSB has reduced their operating costs without sacrificing quality. The Omneon system was chosen in part for its ability to expand incrementally. Channels can be added without the restriction of adding storage, and storage can be added without requiring channels to be added. The system currently has over 120 hours of storage capacity available online.

The server's ability to openly interface with applications and platforms, and its ability to work with all major digital video formats was another critical factor in the decision. Ingest of syndicated programming is managed by Sundance Digital's Intelli-Sat. Commercials and program playout are managed by Sundance's FastBreak automation system, and news is managed by Sundance's NewsLink, which interfaces with the AP's ENPS system.

Once material has been ingested, multiple users can then simultaneously access and edit news packages and promos. The Omneon system permits direct transfer of DV material from storage to the target application without conversion (encoding and decoding) from the native compressed format. Completed segments are “printed” back to the server's directory and later integrated into sequences using Sundance's NewsLink.

With this new operational paradigm, the physical handling of material has been significantly reduced and the ability to work in a single format has dramatically improved WWSB's efficiency. From an economic standpoint, these two factors were the biggest advantages toward a truly time-efficient operation.

WWSB has outmaneuvered their competitors with an integrated and easily scalable operation.

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**Design Team**

AF Associates:
- David Linick, project manager
- Bud Pearson, project engineer
- Bob Tlmpone, project engineer
- Marc Bressack, vice president of sales
- Bill Hall, applications manager, Omneon
- Chris Simpkins, applications developer, Sundance Digital

**Equipment List**

- Omneon Media Server
- Sundance Digital automation system
- Philips LDK-100 triax cameras/DD-35-3 production switcher
- Calrec C2 audio console
- Thomson Grass Valley Venus 2001 router for 128x128
- Leitch DPS-475 frame syncs, format converters
- Tektronix sync generators and scopes
- Miranda Oxtel Presmaster master control switcher
- Pinnacle Liquid purple edit stations
Allbritton Communications’ challenges became opportunities when it combined two properties under one roof in September. WJLA-TV (Channel 7), Washington’s ABC affiliate, and Cable NewsChannel 8, moved into a new 76,000-square-foot facility in Arlington, VA. Shared resources and close interaction between operations created numerous possibilities for personnel, business and production efficiencies.

The complex installation was accomplished in a phased approach, with NewsChannel 8 moving in first, closely followed by WJLA-TV. The facility was designed with separate studios and individual control rooms furnished with similar equipment. Wheatstone’s TV-80 audio console, manufactured to enable stations with a strong local news commitment to deliver fast-paced, up-to-the-minute news, was selected to produce audio for both facilities, along with factory pre-wired harnesses that helped expedite the installation process. Wheatstone previously furnished Allbritton with numerous consoles, successfully serving the station group across many years.

NewsChannel 8, a 24-hour cable news channel serving Washington and its suburbs, opted to replace its aging console with the TV-80. Allbritton’s extensive experience with Wheatstone’s performance and support clinched the decision.

WJLA-TV – Allbritton’s flagship station - moved their two-year-old TV-80 from its former location in the highly competitive Washington, DC, news market.

The TV-80’s dedicated IFB mix-minus busses fit perfectly into the multi-station, news-intensive environment, providing logical paths for streamlining operations that will result in cost savings. The stations share a fleet of seven ENG and three satellite trucks. The mix-minus busses enable one truck and one reporter to cover the same story consecutively for both stations. Crews can also move between the two studios with no loss in audio transmission.

The TV-80 features all electronic switching to ensure the highest reliability and error-proof operation from a streamlined, economical and ergonomic package. Features include modular construction permitting component-level maintenance, LED illumination on every switch, an operator-intuitive eight-bus mix-minus system with external confidence feeds and talkback, and a master confidence IFB panel that can be linked to external tallies.

Allbritton’s history with Wheatstone also furnished a cost-effective formula for successful training. Staff already experienced with the TV-80 trained colleagues, thus expediting the transition process.

Allbritton Communications owns and operates eight TV stations around the country – all ABC affiliates in markets from eight to 103.

**Design Team**

**WJLA:**
- Mark Olingy, director of engineering of Allbritton
- Will Seymour, Sam Jackson, Dave Weaver, Tom Hormuth
- Jim Peck, senior applications engineer, Wheatstone
- Carl Van Dusen, design engineer, Professional Products

**Reese Associates:**
- Ralph S. Blackman, AIA, project director
- Rob Center, RID, project coordinator
- Song Chia, project designer
- Bethany Jackson, interior design

**Equipment List**

- Wheatstone TV-80
- Wheatstone Phase One prewire
- ADC patch bays
- ADC icon blocks
Rainbow Network Communications (RNC), a subsidiary of Rainbow Media Holdings and Cablevision, serves as the command center for Rainbow Media Holding's 19 origination channels, including AMC, Bravo and Fox Sports Net NY. RNC programming reaches more than 150 million people (aggregate) a day.

Communications Engineering Inc (CEI) of Newington, VA, assisted the RNC team in the design and engineering planning. The facility, located in Bethpage, NY, encompasses 46,000 square feet of technical space and 11,000 square feet of office space. The RNC opened in September 2001 following two full years of construction.

The challenge faced by the RNC facility design team in constructing the facility was developing a technical blueprint that would cover the existing needs and future expansion of the facility. The broadcast layout developed featured a combination of shared and customized technical resources designed to meet current and future requirements of the origination channels. The various needs of each channel were considered in order to differentiate between those channels featuring long-play programming and the channels allocated for the origination of more than 1700 hours of live sports programming each year.

Digital and analog feeds originated by RNC are transmitted to the rest of the world by on-site uplink/downlink earth station antennas for both C- and Ku-band satellite reception and distribution. RNC has 25 high-power amplifiers (HPAs) available to send transmissions to satellites such as SESAMC 1, C4 and Galaxy XI, among others. A robust fiber transmission mechanism provides high quality and reliable transport of analog, digital and HD signals from sports venues throughout the metropolitan area and world.

All signals pass through this massive control center transported over 20 routers featuring Thomson Grass Valley's component digital hybrid (standard definition and high definition) video routers, dual AES3 stream digital audio routers, analog composite video routers and four-channel analog audio routers.

A 40-foot-by-40-foot technical operations center featuring more than 250 color monitors on an 11-foot high monitoring wall, 26 rack bays (over 40 feet wide) and a dual-tier console with three additional consoles provides the centerpiece of RNC.

RNC features 12 live control rooms centered around sports and live content channels; two multi-channel control rooms, each capable of handling five channels; two linear editing suites; five quality control rooms for content review; two central pre-production stations for encoding taped material; and four digital linear edit rooms. There are 22 master control suites, an HDTV master control suite and five edit bays.

Design Team
Rainbow Network Communications:
Steve Pontillo, senior vice president and general manager
John Barbieri, vice president of engineering
Mike Malozzi, director of broadcast engineering
John McMahon, director of broadcast engineering and technology
Communications Engineering Inc (CEI):
John Wesley Nash, executive vice president and COO
Jim Conley, vice president of engineering

Equipment List
Thomson Grass Valley routing systems
Thomson Grass Valley M2100 master control switches
Thomson Grass Valley Profile XP servers
Thomson Grass Valley Kalypso production switches
Louth automation systems
BC-affiliate WBBH-TV, owned by Waterman Broadcasting Corp., had an NTSC tower that was 20 years old and didn’t meet federal or local standards for wind loading. It wasn’t economically feasible for the station to upgrade it. With an FCC digital deadline for channels 15 (WBBH-TV) and 41 (WZVN-TV), station management decided to construct a new tower and a new building for its digital transmitters.

The design for the Punta Gorda, FL, tower was based on ANSI EIA/TIA-222-F code. Contractors Kline Towers and Carolina Towers were chosen for their quality and experience in constructing tall towers. Contractor Owen Ames Kimball was hired to build a 2000-square-foot facility to house the station’s transmitters and extensive RF transmission system.

One time-consuming task was convincing Charlotte County that a new tower was needed, but once it was approved, Waterman agreed to build the “replacement” tower and dismantle its existing tower by the NTSC cessation date.

For loading and RF loss considerations, coaxial and waveguide runs on the new tower were limited. Two platforms were specified, one at 450 feet and another at 1350 feet, each supporting equipment enclosures. Thirty-six-count, single-mode fiber, as well as a fifty-pair Telco cable, was run from the transmitter facility to the 450-foot platform, where it was broken out to patch panels, then carried to the 1350-foot platform where it terminated. Nucomm’s V-Stream digital STL radios were specified to be a fully redundant split system with hot-standby and antenna diversity switching between two six-foot Andrew antennas. Dual receivers were placed at 450 feet, and their 70MHz output was sent down the tower via fiber optic transmitters. The 70MHz demodulator then output the 310M to feed each of the ATSC transmitters’ dual exciters. The analog 2GHz Nucomm FR6 digital-ready receiver was placed at the 1350-foot level, along with an NSI Superquad antenna system. This system was split also and the 70MHz signal delivered to the building in the same manner as the STLs. Along with eliminating a 1450-foot coax run, a significant signal level increase was realized at the ENG demodulator. The TSL was then output to the main STL antenna using the fiber in reverse fashion.

According to Dan Billings, Waterman Broadcasting’s director of engineering, the system’s most interesting feature involves transmitting the digital signals for the two stations from one location through one transmission line and antenna. The Andrew-designed RF system switches and combines signals from the WBBH and WZVN transmitters. The combined 54KW signal is carried through 7-3/16-inch MACXLine to the broadband panel antenna that produces 1MW ERP per channel. Combining both transmitters on one antenna is a practical solution for a complex application, with cost savings on line, antenna, tower and construction expenses. This also enables an optimum directional coverage pattern.
The "ABC Nightline" staff had become used to dealing with an unusual problem... they would regularly "crash" long-form broadcasts. It was not unusual for them to produce a thirty-minute, all-tape, broadcast in a twelve-hour day. They would often work in six editing rooms with six editors cutting the broadcast, with everyone working off of shared material. But the days of passing tapes and screaming “I need tape 26 as soon as you’re done” are over.

The staff has also worked to be able to re-purpose their material. At one point they were cutting five “Nightline” half-hours on “The Clinton Years” while doing a 90-minute version for “PBS Frontline.”

They regularly edit long stories under the deadline pressure of a daily, hard news broadcast. Their greatest challenge has been to prove that the Avid system is fast enough to meet their deadlines.

A major goal has been to move the editors and producers into the digital 21st century, which would help give them the skills needed to keep pace with technology.

Nightline was fortunate in that their conversion to nonlinear editing was part of a complete renovation of the Nightline office area. Prior to this renovation/conversion, their editors utilized linear edit rooms in the main edit area. This resulted in producers running up and down stairs carrying armfuls of cassettes. Now the editors utilize new Avid edit rooms that are located within Nightline’s space at the ABC Washington News Bureau. The edit rooms are almost twice as large as their standard bureau rooms. The producers are just steps from the editors, and the editors feel that they are much more a part of Nightline’s operation.

The new Avid edit rooms are all digital; however, they can connect to the existing analog routing system, enabling them to take in analog satellite, microwave and tape feeds from the rest of the bureau. Avid was involved in the initial installation of the system, but the majority of the work, including system design, installation, upgrading and maintenance was performed by ABC’s Washington engineering staff.

The facility is currently accomplishing its goals splendidly. They are creating two separate 30-minute broadcasts for air every night, as well as producing material for other broadcasts and long-form projects. This is not to say that their initial conversion was flawless, though. They started this conversion in 1998, and were a little too ahead of the curve in terms of the hardware available at the time. Their initial goal was to have producers work at their desktops using browse-quality video, but they are still working to make that work to their satisfaction.

**Equipment List**

Avid:
- Unity for News server
- MediaManager
- NewsCutter
- iNEWS newsroom computer system

[Image of Avid equipment]
This new broadcast facility was a project begun by the Medcom Group over two years ago. The group planned to consolidate, upgrade and expand their media holding in the Dominican Republic, and this facility serves as their flagship operation, helping to meet Medcom’s long-term broadcast needs.

To assist them in achieving their business and broadcasting goals, the Medcom Group selected AZCAR as their engineering system consultants, designers and integrators.

With its completion, the new facility helped make Medcom a player in the broadcast industry of the Dominican Republic.

The group’s primary goals were to consolidate and expand their television broadcast interests in a common facility and management infrastructure; integrate state-of-the-art digital technology with SDI/AES signal distribution and server-based media storage facilities; provide a 24-hour news channel similar to CNN in content and presentation, which would enable them to expand their audience base in the Dominican Republic; and produce Spanish-language programming for satellite distribution to expatriate communities in North America.

The new plant incorporates a common master control center for the five independent television channels; Channel 27 (news); Channel 13; Channel 7; Channel 31 and Channel 57.

There is a common central equipment room incorporating the 256x256 central SDI/AES digital router, intercom, news and commercial servers, microwave and satellite equipment for transmission and reception, digital pulse, reference and master clock systems, and standards conversion equipment.

The central operations room contains digital and analog VTRs for playout and record operations and serves as an ingest area for the commercial and news server systems. A camera control center within the operations room provides camera operations for all RNN production studios.

The facility has four production studios. The largest studio serves the commercial production needs of Channel 13. A combination studio/newsroom has been incorporated specifically for production of news Channel 27. The newsroom contains a large Leitch server-based system consisting of 30 browse stations and nine nonlinear edit stations for ingesting and editing. The two remaining studios are primarily used for special additional news productions.

Also included in the design is a large common post-production and graphics center with a dedicated VTR ingest pool that serves the production requirements for the five program channels.

**Design Team**

Telecentro/RNN:
- Jose Miguel Baez, president
- Christophe Saladin, vice president, special projects
- Luis Guaba, technical director

AZCAR USA:
- John Warner, project manager
- Joe Langel, project lead engineer
- John Chyulia, project lead engineer
- Doug Waldron, installation supervisor

**Equipment List**

- Philips/Thompson 256x256 SDI/AES/RS-422 central routing system
- Leitch Velocity post-production and NLE system
- Miranda Kaleido virtual monitor wall
- Ross Synergy production switchers
- Studer audio consoles
- Leitch Opus master control switcher
- Pinnacle Thunder server for stills and clip store
- Ikegami studio cameras
- Leitch NewsFlash news system with nine VR 465 NLEs and browse cutter
WCAX Channel 3 recently integrated a robotic control camera system comprised of two Radamec RP2A pedestals, three Radamec HK 436 pan/tilt heads, and a Radamec ARC 2000 touch control panel into a battery of equipment. The system supports four daily newscasts and two shows—"You Can Quote Me," and "Across The Fence."

The installation marks the station's first foray into robotics, and management was determined to choose a system that would transition as smoothly as possible. Radamec's ARC 2000 touch control panel (TCP) fit the bill. The TCP is comprised of a touch-screen monitor and user-friendly panel control unit (PCU) with an integrated 8x4 video matrix for operator preview and monitor switching. The TCP is capable of controlling up to eight cameras and provides a three-axis proportional joystick for control of pan, tilt and zoom, and an encoder for focus.

Movements of the RP2As, Radamec's free roaming robotic pedestals, are controlled by the ARC 2000. Designed to support any ENG/EFP or full-facility studio lens and teleprompter package, the RP2As use a two-level navigation system to provide both absolute and 'relative' positioning rather than referencing themselves to a home target studio floor position. This allows the RP2A to adapt to nearly any studio environment and offers smooth, controlled movement of floor position and pedestal height.

The WCAX system was designed for current needs and future considerations. The three compact HK436 pan/tilt heads eliminate the need to choose between conventional and virtual robotic applications. The breakthrough HK436 can be purchased in a standard configuration, without VR sensors, and upgraded in the field for virtual applications. WCAX chose the HK436s because they wanted the option to upgrade to virtual reality. The technology represents a major cost savings over traditional robotic systems that cannot be upgraded with virtual sensors.

The HK436 can be fitted with two high-resolution self-referencing encoders with DSP technology that detects the slightest movement of pan or tilt. These signals combine with measurements of zoom, focus and any other axes, and are transmitted to the studio VR system as serial data. The measurement electronics can be locked to video reference or polled by the VR system. Adjustable fluid dampers and brakes ensure smooth operation for manual control.

The heads, designed to ensure responsive control, precise repeatability and smooth, broadcast-quality movement, can support cameras, lenses and teleprompters up to 110 pounds and can be controlled by any Radamec control system. The head easily mounts onto all types of studio pedestals, and indeed, WCAX will be employing a legacy pedestal topped by a 436.

**Design Team**
Radamec:
Bret Lukezic, vice president, U.S.
Gerard Veihmeyer, technician, U.S.
Brian Channell, project engineer, UK
Dave Taylor, technician, UK
WCAX:
Phil Scharf, production manager
Keith Lawrence, studio engineer

**Equipment List**
Radamec:
HK436 pan/tilt heads
Mini head control unit
Lens interface units
PCU (panel control unit) touch control system
Flat touch-screens
RP2A robotic pedestals
Height drive

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Turner Entertainment Networks

Turner Entertainment Network's 193,000-square-foot facility—part of the Turner Broadcasting System—handles 19 cable networks (channels) for both the U.S. domestic and Latin and South American markets, and has additional infrastructure capacity for well over 60 more. These new channels could include digital video, wideband high definition, stereo audio and Internet data.

Prior to this new facility, there was no router that could reliably handle this level of sophistication. So, Turner Entertainment Network (TEN) turned to a Thomson Grass Valley team to help them co-engineer a router that could handle the channels. This resulted in the Trinix digital video routing switcher and a faster version of the Jupiter facility control system.

The unique routing infrastructure at TEN enables deterministic switching, the ability to switch a large number of crosspoints quickly and frame-accurately, and to monitor the networks with Thomson Grass Valley NetCentral software, which supports SNMP and HTTP protocols. The key to the success of the TEN facility is a dual-path, fully redundant routing control infrastructure.

This infrastructure, together with the front-accessible hot-swap modules for all active components in the Trinix routing switcher, allows TEN engineers to easily maintain the system in the unlikely event of component failure, providing a high level of security. Two automation systems, two switchers, two servers and two duplicate fiber-optic paths to the teleport support each of TEN's current 19 channels.

As further security against system failure, TEN has organized its 19 channels into four “pods” that consist of several of their entertainment networks grouped together, each with a larger network as the “anchor tenant.” These pods are generally based on a programming genre. Each pod includes a 128x128 Trinix routing switcher and two Pinnacle MediaStream 900 server systems, and contains four master control rooms. The pods are purposely isolated from each other, so that a problem with a feed in one will not affect networks in any other.

The new serial digital plant also features a media operations center that serves as a common area for all of Turner’s entertainment networks. It houses dozens of VTRs and a huge, 22TB EMC redundant central cache with an additional 22TB of redundant storage in two Asaca DVD Jukeboxes.

To handle its hundreds of video feeds, TEN has installed nine Trinix routers, eight configured at 128x128, and one at 256x256. While most audio is embedded with the video signals, a number of Venus routing switchers are deployed for separate audio signals.

The Trinix routing switcher is designed to support both SD and HD operations within the same frame, which was another requirement from TEN to ensure future expansion and to make the most of their significant investment in new technology. This expandability includes the possibility to build out 30 control rooms, with some rooms (like those in TEN’s international pod) handling four channels each. By September of next year, all 19 channels will be operating out of the new building.

Design Team
TEN Network Operations Group
TEN Engineering Project Group
TEN Properties
HLW
KPS Architects
Turner Construction Company
AZCAR
TEN Migration Engineering Group
MCSi:
Michael Wright, national project development director
Joe Fiscina, senior project manager
On May 20, 2002, WCBD-TV (Channel 2), a Media General broadcast group NBC affiliate in Mount Pleasant, SC, began broadcasting from its uniquely integrated digital facility designed by Professional Communications Systems (PCS).

Located across from a South Carolina landmark, Patriot’s Point, at the foot of the Cooper River Bridge, WCBD has been serving the metropolitan area of Charleston for more than 30 years. WCBD’s production and broadcasting equipment was in serious need of updating and the station was still operating out of its original building, a World War II era Quonset hut. It was way past time for a change, and Media General decided that now was the time to move into a new facility and into the digital era at the same time.

Specific goals and parameters were established at the beginning of the project. Media General wanted WCBD to be the leader in the Charleston market and to be able to provide its audience with a broadcast signal technically superior to any of its competition from the most sophisticated broadcast facility in the region. Although WCBD won’t initially originate high-definition television programming, the station did want the capability to repurpose HD. Moreover, with the proven efficiencies of digital technology in video production, transfer and storage systems, it made sense to make the new station an all-digital facility.

According to Glenn Thomason, director of engineering for PCS, the broadcast systems integrator approached the project as building an “operational utopia” instead of an “engineering jungle.” By focusing on the operational needs of WCBD, care was taken to keep it simple to operate. The engineering complied with this approach while maintaining the very highest standard, Thomason said.

WCBD’s operational staff is happy with this simple-to-operate, yet powerful and flexible system. They are also pleased with the redundancy that was built in to allow them to work around any potential equipment failures. The facility uses as much compatible equipment as possible to maximize the amount of status monitoring/reporting and remote control available at several locations. Enough expansion capability was included in the design at the outset of the project so that any expansion requirements in years to come can be implemented with limited equipment purchases and input from outside resources.

Professional Communications Systems is an audiovisual and broadcast systems integrator specializing in design, engineering facilities planning and project management.

**Design Team**

PCS:
- Glenn Thomason, director of engineering and project manager
- Ed Kothera, sales engineer
- R.A. “Tony” Stephens, vice president/general manager
- Ardell Hill, senior vice president, broadcast operations, Media General
- Richard Fordham, general manager, WCBD
- Jack Becknell, chief engineer, WCBD

**Equipment List**

- Thomson Grass Valley switchers, routers
- Calrec audio console
- Pinnacle servers, character generator and still stores
- Panasonic DVCPRO cameras and decks
- Miranda conversion and distribution equipment
- Florical automation
- ClearCom intercom

76 broadcastengineering.com Advertising Showcase DECEMBER 2002
When Allbritton Communications decided to consolidate their flagship station, WJLA-TV7, and local cable news, NewsChannel 8, an innovative broadcast center was required to maximize the operational efficiencies anticipated through the use of new technology. The new integrated facility, located in Arlington, VA, boasts a state-of-the-art digital infrastructure and combines resources to support operations of both stations. The Systems Group (TSG) of Hoboken, NJ, began feasibility and consultancy work in 2001. WJLA chose to split the integration between TSG and Maryland-based Pro Products Inc. (PPI). TSG was tasked with the design and integration of master control, acquisition and the primary broadcast systems backbone. PPI built the studio, news and production systems.

The core systems of the facility included routing, intercom, broadcast LAN, MATV, reference head-end and distribution. Thomson Grass Valley provided 7500 series frames for SDI and 75Ω AES routing, and Venus matrices for time code and control routing. A Clear-Com Matrix 3 system and a reference head-end that includes a redundant GPS system were also core system components. To support systems that take advantage of Ethernet-based control and file-sharing, TSG implemented a fiber backbone throughout the facility utilizing HP Procurve switches. This, combined with an extensive KVM system by Raritan, also provided interconnection to the enterprise network for WAN and maintenance access from engineering desktops.

The current master control operation handles three regional feeds for NewsChannel 8, and analog and digital transmissions for WJLA, with capability to accommodate up to eight transmission paths. The master control environment is centered around a Harris automation system that controls the Leitch VR-440 servers used for playout, Thomson Grass Valley M2100 switchers and Encore routing control system, and Pinnacle Dekocasts for branding and DVE effects. Channel branding, time and temperature insertion, election results, school closings, breaking news, EAS and emergency weather alerts are processed by software from Business Technology.

Virtual monitor wall systems were implemented in the control rooms. The large Clarity rear-projection systems, combined with Evertz Quattro cards and VistaLink Pro SNMP monitoring software, gave operators audio and video confidence monitoring of all incoming and outgoing signals, while providing the flexibility for easy reconfiguration and future expansion.

Satellite operations and acquisition run from Harris automation. WJLA receives content from subscription service providers Pathfire and Digital Generation Systems. This content is ingested through automation into the Leitch VR-440 play-to-air servers. All incoming feeds are synchronized and processed by Leitch DPS-575 frame synchronizers prior to ingest and playout.

Design Team
WJLA-TV and NewsChannel 8:
Robert Allbritton, president
Mark Olingy, director of engineering and operations
Will Seymour, executive engineering staff
Tom Hormuth
Dave Weaver
Sam Jackson
The Systems Group:
Scott Griffin, project executive
Raoul Edwards, project manager
Bob Degnan, senior systems engineer
James Tome, systems engineer
Mattias Allevick, integration supervisors
Alex Blanding, documentation coordinator
Trissa Dudzinski, project coordinator
Univision Network constructed a new headquarters building with space to include facilities for KMEX and KFTR, the outlets for Univision and Telefutura in Los Angeles. The site presented particular challenges, as it was located immediately adjacent to one of Los Angeles’ prime freeways, but the new building was completed on time and KMEX went on-air as scheduled in the spring of 2002. BFA was chosen to manage the project and provided conceptual design services for the systems. AZCAR was selected for the detailed design and installation, which was completed in approximately four months from contract to commissioning. The facility is more than 25,000 square feet and required more than 8,100 cables consuming more than 600,000 feet of wire.

The station incorporated a combination of existing analog and composite digital equipment from the previous KMEX facility, requiring thoughtful integration and design strategies. One new studio control room was included in the plan, and is equipped with a Thomson Grass Valley Kalypso video production center and Pinnacle Thunder and FXDeko for graphics, stills and clips. The control room is used to produce a Spanish-language newscast.

Two feeds are produced in master control, one using a conventional master control architecture, and the other using a Ross CDK 104 mixer keyer and Graham-Patten audio switcher to accomplish a simple and cost-effective master control for the Telefutura output from the facility.

The newsroom utilizes advanced workflow concepts. Avid supplied a major iNews installation, which is interfaced with an Avid Unity media network. Incoming feeds are ingested into the system, which includes four Avid NewsCutter nonlinear editing bays, as well as Media Composer and Digital Studio editing rooms for more complicated stories and other station programming. KMEX news also has additional edit facilities that use Final Cut Pro running on MAC G4 with a Firewire interface. Three linear tape-based editing suites complete the newsroom complement.

The facility has a very busy feeds record area for dubbing news feeds to tape and to Avid Unity through Pluto servers and an Avid Unity Control Air feeds record workstation. The area has six network feeds, 10 wild news receive paths, and four microwave paths.
WWNY-TV, a CBS and FOX affiliate serving the Watertown, NY, television market, has been casually upgrading its facility over the past few years from its analog beginnings to a digital future.

Unlike most television facilities, WWNY has enough space to accommodate changes without having to reconstruct existing setups or build additional space. When WWNY signed on as the local FOX affiliate, it could accommodate new digital equipment into existing master control space. The station added an Oxtel digital master control switcher as the centerpiece of its FOX operations. The CBS side of master control will be digitally upgraded shortly. WWNY currently uses an analog Thomson Grass Valley Master 21 switcher for its operations.

Just prior to launching its FOX operations, WWNY took a long look at its news production operations. With much of its staff moving on to retirement or new employment, and its legacy equipment aging to the point where manufacturer support had halted and parts were discontinued, station management decided to look into new options that would further its push toward a facilitywide digital upgrade. Their decision led to the acquisition of a ParkerVision PTVT News live production automation system for the control room upgrade.

WWNY installed PTVT News directly alongside the legacy equipment it replaced. The positioning of the system allows the director to be near where he or she was seated during traditional news production, with a clear view of the Sony monitor wall in master control. Of the equipment replaced, most notable was a Thomson Grass Valley 200 production control switcher and a Sony MX2000 audio console, both nearing 20 years in age and long discontinued by their manufacturers. Though still functioning well, the cost-effectiveness of the PTVT News system far exceeds the cost of what it would have been to repair and/or replace the legacy systems.

ParkerVision’s Digital CameraMan 3-CCD robotic pan/tilt cameras and a Digital Shot Director multi-camera control system also played a vital role in the upgrade, replacing the facility’s aging analog newsroom cameras, and several camera operators who had left or were ready to leave the station. The facility was also able to establish relationships between PTVT News and existing video production equipment, most notably its Chyron dual-channel MAX and Aprisa 100 still store. PTVT News is integrated via serial port control with both systems to talk to and call up graphics for air as needed.

The addition of PTVT News came at about the same time the facility added a Thomson Grass Valley Profile server. Integrated with PTVT News, the Profile server digitizes stories and floats them into the system, eliminating the need to trigger decks to roll video for a particular story. The facility also added a Thomson Grass Valley Vibrant nonlinear editor that it will integrate with PTVT News in the near future. The integration will allow a user to edit packages for news programming and send them directly into the system.

**Equipment List**
- Thomson Grass Valley Master 21 master control switcher
- Oxtel master control switcher
- ParkerVision PTVT News
- Louth/Harris automation
- Thomson Grass Valley Profile server
- Thomson Grass Valley Vibrant nonlinear editing suite
- Auto Sat satellite program acquisition system
- Thomson Grass Valley 7000 digital router (32x32) and analog router (48x32)
- Pinnacle Alladin Pro DVE/title deko
- Chyron Aprisa still store
- Chyron MAX (dual channel)
Starz Encore Group

Starz Encore Group moved into a brand-new facility and went on the air in January of 2002. The move consolidated the business and technical operations of the company, which were previously in two separate locations. The company is housed in a new 300,000-square-foot building located in the Meridian office park in southeast Denver.

Starz broadcasts 13 channels: Starz, Encore, Starz Theater, Black Starz, Starz Cinema, Starz Family, Westerns, Mystery, Action, Love Stories, True Stories, WAM and MoviePlex. All of these channels have east coast and west coast timezone feeds, which are distributed nationwide on three satellites. Five channels are uplinked as analog signals to the backyard C-band dish market. A total of 36 feeds originate from the facility.

In conjunction with the move to a new facility, a decision was made to upgrade the on-air operation from a semi-automated tape-based playout system to a fully automated, digital video server-based playback and transmission center. To facilitate this upgrade, a study of the operation and processes was made, system requirements determined, and RFPs were prepared and sent to automation, server and data archive vendors, as well as systems integration companies.

Over a period of several months, numerous systems and equipment proposals were reviewed and evaluated. The selected companies were Omnibus Systems (automation), Pinnacle Systems (servers), Sony (archive), Pinzone Engineering (uplink) and Beck Associates (systems integration). Wiring of the technical plant was on a severely constricted six-month timeframe in order to reach the on-air target date.

The broadcast center contains three automation systems, 12 playback servers, two ingest servers and one data tape archive system. A total of 52 lists are running around the clock on the automation system to control the broadcast ports of the primary and mirrored backup feeds. There are approximately 200 hours of storage per channel on disk, at a playback data rate of 15Mb/s. The channels/feeds are monitored by two playback operators and one supervisor. Three channels (six feeds) are configured for playback of Dolby Digital 5.1 surround sound. All materials on the server and archive contain three pairs of audio including English, Spanish (SAP) and Dolby Digital 5.1 or 2.0.

The uplink transmission facility contains four 9-meter transmit dishes and six 4-meter receive dishes. The transmission chain is designed with an automatic one-for-one redundancy on digital feeds and one-for-five redundancy on the analog feeds. The facility went on-air on Jan. 21, 2002. In the first eight months of operation, discrepancies and outages were reduced by two-thirds in comparison with the previous tape-based system at the old facility.
ALA-TV, an Emmis Broadcasting television station located in Mobile, AL, recently opened its new facility following a move from its longtime location in downtown Mobile. A FOX affiliate serving the Mobile and Pensacola, FL, markets, WALA also serves as a spoke station to the Emmis centralcasting hub at WKCF-TV in Orlando, FL.

Digital System Technology (DST) served as systems integrator for the new WALA facility. The new site called for a full analog-to-digital video upgrade and was designed as a centralcasting spoke station.

DST provided WALA with several groundbreaking systems. The first was a tapeless news environment created using a Thomson Grass Valley NewsQ Pro interface. The install marked the world’s first NewsQ Pro tapeless news environment and allowed WALA news reporters to transfer stories directly onto a Thomson Grass Valley Profile server. This system, installed in the main production room along with a Thomson Grass Valley Vibrant editing bay for story editing, uses the NewsQ Pro setup to interface with an AP news system. NewsQ Pro tracks the stories and keeps the playlist current with the newscast rundown.

Story editing is also faster. Once on the Vibrant, the user can transfer a story to Profile as a fiber-optic file transfer for play to air, making the transfer faster than real-time. This provides both the advantages of nonlinear editing and the speed of linear editing. Six identical Vibrant news edit bays are located directly off the newsroom, along with three Discreet Logic nonlinear editing rooms: one main edit room, and two smaller rooms designed for production of promos and commercial spots.

The second groundbreaking solution was an interface designed by DST to automatically segment certain news feeds.

Network news feeds come into the station via satellite, and a gap of several minutes appears between each story. For a fully automated process, DST developed an interface using Evertz Quattro systems to sense freeze frames between stories from network news feeds. The Evertz Quattro speaks to a CompuSat system, reads the frozen video as one story ends, stops recording and starts again at the beginning of the next segment. The story is then saved onto the Profile server.

With the Gulf of Mexico shoreline location of Mobile, corrosion of the patchbays due to the salty ocean air can became more of a reliability problem than the hardware. To address this issue, DST created a unique patchbay-like system in which three-pin Ecko audio bulkheads were used to connect the audio portion of the broadcast system. Cables can be removed and plugged into different inputs for simple system reconfiguration.

### Design Team

**DST:**
- Janet Crumb, project manager
- Dwight Crumb, lead design engineer
- Bill Hodson and Simon Shepherd, installation leads

**WALA:**
- Johnny Reece, complete design review
- Marty Draper, corporate design review

### Equipment List

- Thomson Grass Valley NewsQ Pro
- Thomson Grass Valley Profile server
- Thomson Grass Valley Vibrant editing bay
- CompuSat satellite systems
- Discreet Logic nonlinear editing systems
- Wheatstone TV-80 audio console
- Mackie eight-bus 24-8 mixer
- Evertz Quattro quad-split monitors
- Thomson Grass Valley Venus router
- Thomson Grass Valley Zodiac production switcher
- Ross DSS-8024 switchers
- TANDBERG Television TT6010
- Sony BVP-950 studio cameras
MTV Networks has grown substantially since its inception, and production requirements have increased with the channel's popularity. MTV's operational needs had grown to the point where much of the post-production and graphics work for the channel had been outsourced. In addition to third-party providers, MTV had built up a number of off-site suites and facilities. With these various resources, MTV managed to satisfy their extensive production schedule, though limited technical resources and difficult logistics created unique challenges for engineering and production staffs. Operating in such an expanded environment created inefficiencies in the daily routines and restricted the expeditious growth MTV required.

Focused on efficiency, MTV Networks made a decision to consolidate these facilities into their broadcast operations center at 1515 Broadway, where they could centralize staff resources and leverage the significant technical infrastructure MTV had created throughout the last decade. This reorganization required a large capital expenditure, which was recognized swiftly with the benefits of operational efficiencies and savings from the reduction of outsourced services. Since this facility was to serve all of the MTV Networks, it was important to create an image that was not identified with the branding of any one of the networks but would embody the innovative spirit and character of all the networks. The futuristic technical environment was inserted into the rough shell of the office building to create the feeling of a creative laboratory.

The new facilities, appropriately named “Central Facilities,” are located on the 10th floor of the Viacom building and were constructed to provide MTV with a 25,000-square-foot centralized operations center for four online edit suites, 20 Avid nonlinear suites, multiformat duplication, fiber optic transmission and acquisition, 23 3-D digital animation/high-end rendering workstations, titling and paint stations, and maintenance facilities. A 3000-square-foot core equipment area provides a location for the system mainframes, including a multi-level 256x256 wideband routing switcher, a 64x64 intercom system, 20 A/V frame synchronizers for transmission services, more than 40 tape machines, the Avid Unity system hardware, and multiple quality control stations. MTV standardized on a combination of broadcast products to maintain cost-efficiency from a purchasing and ongoing maintenance perspective.

Staff relocation, office demolition and subsequent rebuilding of the technical spaces required the utmost attention in timeline coordination between MTV, The Systems Group, Kostow Greenwood Architects and the general contractor.

Design Team
Michael Bivona, director of engineering, MTV Networks
The Systems Group:
Joseph Policastro, project manager
Robert Gilmartin, systems engineer
John Zulick, project engineer
Darwin Clermont, integration supervisor
Kostow Greenwood:
Michael Kostow, principal
Charles Gustina, project manager
Viola Rouhani, project architect
Eric Heidt, architect
Laura Dolph, interior designer
Elora Cosper, interior designer

Equipment List
Leitch DPS frame synchronizers
Miranda VTR-100 conversion products
Avid Unity nonlinear edit systems
Ikegami video monitoring
RTS Intercom products
Audio Accessories patching products
France Télévisions Publicité (FTP), the advertising-production subsidiary of national broadcaster France Télévision, wanted to streamline its production process into one that was more cost-effective and efficient. A good portion of its costs involved creating videotapes of commercial spot segments, making dubs and transporting these dubs via courier to remote broadcast locations throughout the country. FTP wanted to digitally ingest commercial spot content, edit specific commercial break sequences, and deliver content directly from the central location to the transmission servers—allowing for last-minute schedule changes impossible with a tape-based system. They also wanted to develop an extranet for advertisers and agencies to view spots before air. Plus, they wanted to add the capability for advertisers and agencies to view a legal air-check online, up to eight days after broadcast, with a minute-by-minute graphical link to ratings of the program and the commercial from French audience research firm Médiamétrie. Early last year, Christophe Scherer, IT and technical director, took FTP digital.

With three main channels – France 2, France 3 (including local transmission sites) and France 5 – in addition to nine thematic channels, FTP chose SGI as the prime contractor to migrate to this centralcasting model. Scherer began with France 5. The solution designed by SGI is based on a hub-and-spoke model and similar to an edge-server architecture. It employs SGI Media Server for broadcast systems providing MPEG-2 ingest capabilities at the central facility in Paris. From there, video content is distributed as data files to smaller SGI Media Server systems, which provide playout services for the spots at the local transmission facilities. Connection to the SGI Media Server systems is via a private ATM network. As a free service to France Télévisions Publicité’s customers, a 200TB Sony Petasite with a capacity of 35,000 30-second spots has housed all spots since the system went online. Because of the open networking capabilities of SGI Media Server for broadcast, FTP was able to utilize an existing network without purchasing hardware to convert physical interfaces.

FTP now uses an all-digital, disk-based architecture for commercial playout. It runs on an SGI Origin 3200 server with two Sony Petasites, Thomson Grass Valley Profile servers (which are being replaced by SGI Media Server for broadcast systems), SGI Origin 2000 servers, an SGI CXFS shared file system, SGI DMF (Data Migration Facility), and other support equipment.

With more than 35,000 commercial spots now in online or near-line storage, the FTP staff has access to the spots as data via a high-speed Ethernet network.

The system works so well that France 2 is currently testing its system and France 3 is scheduled for testing in April 2003.
the systems group your audience is waiting.

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Manufacturers/Dealer Addresses

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400 Sylvan Ave, Englewood Cliffs, NJ 07632
Tel: 201-816-2900; Toll Free: 800-321-HDTV; Fax: 201-816-2903; E-mail: bcvt@cusa.canon.com; Web: www.canonbroadcast.com

Canopus
711 Charcot Ave, San Jose, CA 95131; Tel: 408-954-4500; E-mail: info@canopuscorp.com; sales@canopuscorp.com; Web: www.canopus.com

CaptionMax
530 N 3rd St, Minneapolis, MN 55401; Tel: 612-341-2566; Toll Free: 800-822-3566; Fax: 612-341-2345; E-mail: derek@captionmax.com; Web: www.captionmax.com

Carton USA
10603 Burbank Blvd, North Hollywood, CA 91601; Tel: 818-760-8240; Toll Free: 800-845-6619; Fax: 818-760-8805; E-mail: c.cartoniusa@aol.com; Web: www.ste-man.com

Tel: 612-341-3566; Toll Free: 800-822-3566; Fax: 612-530 N 3rd St, Minneapolis, MN 55401; Tel: 801-947-0909; E-mail: info@cocom.com; Web: www.cocom.com

CGS Infographics Automation
11049 Magnolia Blvd, North Hollywood, CA 91601; Tel: 818-789-3715; Fax: 818-585-9865; E-mail: sales@centuryoptics.com; Web: www.centuryoptics.com

Clarity Visual Systems
9025 SW Hillman Ct, Ste 3122, Wilsonville, OR 97070; Tel: 503-570-0700; Fax: 503-582-8570; E-mail: marketing@clarityvisual.com; Web: www.clarityvisual.com

Clark Wire & Cable
1355 Armour Blvd, Mundelein, IL 60060; Tel: 847-949-9944; Toll Free: 800-CABLEIT; Fax: 847-949-9959; E-mail: sales@clarkwkc.com; Web: www.clarkwkc.com

Compix Media
2730 Monterey St, Ste 103, Torrance, CA 90405; Tel: 310-320-6937; Fax: 310-320-9338; E-mail: info@compixmedia.com; Web: www.compixmedia.com

Comprehensive Video Group
55 Ruta Ct, PO Box 371, S Hackensack, NJ 07606; Toll Free: 800-526-0242; Fax: 201-814-0510; Web: www.comprehensivevideo.com

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Computer Modules
2350 Walsh Ave, Santa Clara, CA 95051; Tel: 408-496-1881; Fax: 408-496-1886; E-mail: info@computermodules.com; Web: www.computermodules.com

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357 W 2700 S, Salt Lake City, UT 84115; Tel: 801-466-3463; Toll Free: 800-496-3463; Fax: 801-442-6906; E-mail: sales@comtek.com; Web: www.comtek.com

Continental Microwave
12980 S 32nd St, Waukesha, WI 53186; Tel: 262-557-3400; Toll Free: 800-297-0077; Fax: 262-557-3401; E-mail: sales@continentalmicrowave.com; Web: www.continentalmicrowave.com

Control Concepts
PO Box 138632/328 Water St, Binghamton, NY 13901; Tel: 607-724-2484; Toll Free: 800-288-6169; Fax: 607-722-8713; E-mail: info@controlconcepts.com; Web: www.controlconcepts.com

Cool-Lux
412 San Pablo, Ste 200, Camarillo, CA 93010; Tel: 805-482-4820; Toll Free: 800-223-2589; Fax: 805-482-0738; E-mail: coollux@cool-lux.com; Web: www.cool-lux.com

CPC/Computer Prompting & Captioning
1010 Rockville Pike, Ste 306, Rockville, MD 20852; Tel: 301-732-8467; Toll Free: 800-977-6678; Fax: 301-738-8488; E-mail: info@cpcweb.com; Web: www.cpcweb.com

CPI
811 Hansen Way, Palo Alto, CA 94304; Tel: 650-846-2801; Fax: 650-424-1744; E-mail: brad.senge@cpi.com; Web: www.cpi.com

CPI – Eimac Division
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CPI – Satcom Division
PO Box 51625, Palo Alto, CA 94303; Tel: 650-846-3700; Fax: 650-424-1744; E-mail: marketing@satcom.cpi.com; Web: www.satcom.com

Crispin
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Crystal Vision
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**Da-Lite Screen Company**
3100 N Detroit St, Warsaw, IN 46581; Tel: 219-267-8101; Toll Free: 800-522-3727; Fax: 219-267-7004; E-mail: info@foodtela.com; Web: www.foodtela.com

**Data Check**
1375 Saticoy St, Van Nuys, CA 91402; Tel: 818-578-0101; Fax: 818-373-5401; E-mail: bcacosta@datacheck.com; Web: www.datacheck.com

**Databreak**
1121 Bristol Rd, P0 Box 949, Raymond, ME 04071; Tel: 207-655-4555; Toll Free: 888-343-5328; Fax: 207-885-7120; E-mail: dsales@dielectric.spx.com; Web: www.dielectric.com

**Digital Images**
2915 Commers Dr, #900, Eagan, MN 55121; Tel: 651-688-0888; Fax: 651-688-8284; E-mail: iamid2@d2z.com; Web: www.d2z.com

**Digital System Technology**
17571 Tagua St, Irvine, CA 92620; Tel: 626-472-7701; Fax: 626-472-7710; E-mail: hq@dsstech.com; Web: www.dsstech.com

**Digital Vision (US)**
4605 Lankershim Blvd, Ste 700, North Hollywood, CA 91602; Tel: 818-769-8111; Fax: 818-769-1888; E-mail: sales@digitalvisionusa.com; Web: www.digitalvisionse

**Digital Vision AB**
Uplagsvägen 1, Stockholm 11745 Sweden; Tel: +46 8 546 18200; Fax: +46 8 546 18209; E-mail: sales@digitalvision.se; Web: www.digitalvision.se

**Digital Voodoo Pty**
17b Market St, South Melbourne, Vic 3205 Australia; Tel: +61 (3) 9682 9477; E-mail: simon.h@digitalvoodoo.net; Web: www.digitalvoodoo.net

**Discount Video Warehouse**
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**Disctech Software**
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**Diversified Marketing International**
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**DK-Audio AG**
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**DNF Controls**
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**Doremi Labs**
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**EASI-Efficient Antenna Systems**
PO Box 285, Clear Lake, IA 50428; Toll Free: 844-424-5079; E-mail: thedrick@easiast.com; Web: www.easiast.com

**Eastman Kodak**
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**Electro-Voice**
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**EMCE Broadcast Products**
P.O.Box 88, Susquehanna St Ext, White Haven, PA 18651; Toll Free: 800-233-6193; Fax: 570-443-9257; E-mail: jrardam@emceebrd.com; Web: www.emceebrd.com

**Encoda Systems**
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**Enseo**
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<td>Hamlet Video International</td>
<td>Orchard House Amersham Rd, Chesham, Bucks HP5 1NE England; Tel: +44 1494 793 763; Toll Free: +44 0500 625 525; Fax: +44 1494 793 261; E-mail: <a href="mailto:sales@hamlet.co.uk">sales@hamlet.co.uk</a>; Web: <a href="http://www.hamlet.co.uk">www.hamlet.co.uk</a></td>
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<td>Ikegami Electronics</td>
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<td>Imagine Products</td>
<td>1620 Midland Ave, Toronto, ON M1P 3C2 Canada; Tel: 416-750-8872; Fax: 416-750-8015; E-mail: <a href="mailto:sales@imaginovideo.com">sales@imaginovideo.com</a>; Web: <a href="http://www.imaginovideo.com">www.imaginovideo.com</a></td>
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<td>Imagine Solutions</td>
<td>12220 N Meridian St, #130, Carmel, IN 46032; Tel: 317-843-0700; Fax: 317-843-0870; E-mail: <a href="mailto:imagine@imagineproducts.com">imagine@imagineproducts.com</a>; Web: <a href="http://www.imagineproducts.com">www.imagineproducts.com</a></td>
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<td>Image Video</td>
<td>4 chemin du Tir-au-Canon, 1227 Carouge Geneva CH-1227 Switzerland; Tel: +41 22 308 57 58; E-mail: <a href="mailto:info@inciteonline.com">info@inciteonline.com</a>; Web: <a href="http://www.inciteonline.com">www.inciteonline.com</a></td>
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## Manufacturer/Dealer Addresses

### Media 100
450 Donald Lynch Blvd, Marlboro, MA 01752; Tel: 508-460-1600, Toll Free: 800-773-1770; Fax: 508-263-1713; E-mail: sales@media100.com; Web: www.media100.com

### Media Computing
PO Box 4169, Cave Creek, AZ 85327-4169; Tel: 480-575-7291; E-mail: mikes@MediaComputing.com; Web: www.mediacomputing.com

### Media Concepts
2128 N Yellowwood Ave, Broken Arrow, OK 74012; Tel: 918-252-3600; Fax: 918-250-1155; E-mail: mediaconcepts.tv; Web: www.mediaconcepts.tv

### MGE UPS SYSTEMS
1660 Scenic Ave, Costa Mesa, CA 92626; Tel: 714-357-1636; Toll Free: 800-523-0142; Fax: 714-557-9788; E-mail: info@mgeups.com; Web: www.mgeups.com

### MicroCommunications
PO Box 4365, Marlborough, MA 01752-4365; Tel: 603-624-4381; Fax: 603-624-4822; E-mail: deborah.norton@mcmbroadcast.com; Web: www.mcmbroadcast.com

### MicroVideo
The Old Farm Offices Copley Hill Farm, Cambridge Road, Shambhala Cambridge CB2 4GP, England; Tel: +44 1223 834 119; Fax: +44 1223 834 481; E-mail: sales@micrvideo.co.uk; Web: www.micrvideo.co.uk

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<th><strong>Manufacturer/Dealer Addresses</strong></th>
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<tr>
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<td><strong>Neutrik USA</strong></td>
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<tr>
<td><strong>New England Satellite Systems</strong></td>
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<tr>
<td>776 Hartford Turnpike, Shrewsbury, MA 01545; Tel: 508-842-4328; Fax: 508-842-4857; E-mail: <a href="mailto:jfoley@ix.netcom.com">jfoley@ix.netcom.com</a>; Web: <a href="http://www.newenglandsatellite.com">www.newenglandsatellite.com</a></td>
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<td><strong>Newtec America</strong></td>
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<td><strong>Nickless Shirmer &amp; Co</strong></td>
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<td>7745 Foundation Dr, Ste 1, Florence, KY 41042; Tel: 859-727-6640; Toll Free: 800-543-1884; Fax: 859-727-6658; E-mail: <a href="mailto:nickless@nshirmer.com">nickless@nshirmer.com</a>; Web: <a href="http://www.nicklesshrmer.com">www.nicklesshrmer.com</a></td>
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<tr>
<td><strong>N-KT</strong></td>
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<td><strong>Norpak</strong></td>
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<td><strong>Northrop Grumman Electronic Systems</strong></td>
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<td>1035 Westminster Dr, Williamsport, PA 17701; Toll Free: 800-861-1843; Fax: 570-326-2903; E-mail: <a href="mailto:wpt.customer.service@littondd.com">wpt.customer.service@littondd.com</a>; Web: <a href="http://www.littondd.com">www.littondd.com</a></td>
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<td><strong>Opticomm</strong></td>
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<td><strong>Orban</strong></td>
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<td><strong>Pag USA</strong></td>
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<td>3330 Calenha Plaza Blvd W, Los Angeles, CA 90068; Toll Free: 800-528-6001; E-mail: <a href="mailto:sales@panasonic.com">sales@panasonic.com</a>; Web: <a href="http://www.panasonic.com/television">www.panasonic.com/television</a></td>
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18 rue Stephenson, Paris F75018 France; Tel: +33 1 42 62 68 20; Fax: +33 1 42 62 40 01; E-mail: teratek@teratek.com; Web: www.teratek.com

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1445 Jamika Dr, #8, Erlanger, KY 41018; Tel: 859-282-7003; Toll Free: 800-721-4044; Fax: 899-282-6225; E-mail: sales@tvone.com; Web: www.tvone.com
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