THE 2001 MAKES AUDIO NETWORKING PRACTICAL. It's simple to install, easy to learn, and certain to reduce system costs. Compact enough for small applications, yet stackable for tremendous growth potential, it's design consists of 7" rackmount digital routing cages, each capable of handling 512 simultaneous audio channels on its backplane.

Units can be stacked to suit particular card complements (analog or digital input and output cards or optical network cards) but more significantly cages can be separated by great distances and network their audio through either bidirectional fiber optic links or a single CAT-5 wire. ONE INTERCONNECT DOES IT ALL: 64 channels of simultaneous bidirectional digital audio, intercage communication, X-Y controller commands plus auxiliary RS-232 data streams. This single interconnect between your studio and central rackroom can save you tens if not hundreds of thousands of feet of wire in a typical installation.

The 2001's graphic based setup software is intuitive and easy to use, with all the authorization and security levels you could want. And of course we have a full complement of control panels and PC applications to choose from—all designed for straightforward operation and a rapid learning curve.

With 25 years of experience, Wheatstone has the infrastructure in place to help you build your OWN infrastructure. Contact us for answers.

MIXED SIGNAL SWITCHING is easily accomplished with a choice of AES digital or ANALOG 24-bit A>D input cards, and of course 24-bit digital or 24-bit D>A ANALOG output cards, all of which can be serviced from the front of the cage. All signals are routed entirely in the digital domain.
The brave, new world of digital broadcasting offers extraordinary opportunities for you to function more efficiently, create new sources of revenue and realize exceptional cost savings. The key to all of this, of course, is centralization - the ability to consolidate, manage and direct all of your resources through a single control system.

Enter the B.R.A.I.N. Center: Broadcast Resource Asset and Information Network. This unique product combines Harris' unmatched business, technology, automation and systems expertise to provide an intelligent, profitable centralization strategy for your enterprise.

With the assistance of Harris centralization experts you will:

- **Analyze** your business and operational requirements
- **Visualize** appropriate implementation models
- **Actualize** the cost-effective integration of your separate operations into a centralized entity

Make the intelligent choice: Contact Harris today to learn more about centralization and how the B.R.A.I.N. Center puts you in control.
This year's Broadcast Engineering Buyers Guide contains all the standard useful features you've grown to love. A detailed list of products by product category and the companies that make them is provided. In addition, when you find the product you want, the phone number is right there—no searching around for the contact number. Hundreds of products are listed in 37 categories so it's easy to locate the resource you need.

The manufacturers' directory begins on page 98. Need a phone number, address or Web site? It's there and easy to find.

As a special addition to this year's Buyers Guide, we're presenting the Broadcast Engineering Engineering Excellence Awards. Twenty-three installations are highlighted, showing leading technology at work. These are some of the newest facilities built by top systems integration companies and manufacturers in the business. In these stories, you'll learn interesting design ideas and see how others use technology to solve their problems.

In addition, readers are asked to VOTE for their favorite installation. Go to the Broadcast Engineering Web site, www.broadcastengineering.com, and vote for the best RF and best studio installation. The three winners will be announced in the March issue of Broadcast Engineering and winners will be presented with an award plaque at the NAB 2002 convention.

Readers win too! Ten readers' names will be drawn from the votes entered in the Engineering Excellence Awards and they will win a Broadcast Engineering t-shirt. All you have to do is vote for your favorite installation. To vote, go to www.broadcastengineering.com.

Brad Dick
editorial director
"You can't beat Panasonic's 27V for its speed, operating cost and indistinguishable film look."

-Michael Caporale, Director of Photography

HD Cinema advances the art of storytelling.

The mobility, versatility and operating cost advantages of Panasonic's AJ-HDC27V variable-frame HD Cinema™ Camera are creating new opportunities for visual artists.

From a music video for the Charlie Daniels Band to a major league baseball documentary, director of photography Michael Caporale has shot demanding projects, including the feature-length movie "Tattered Angel," with the AJ-HDC27V. He praises the lower costs and shortened production time. "We're realizing terrific economies by shooting with the 27V. For 'Tattered Angel,' tape stock was a mere $1,500 versus $104,000 for film and processing. Plus, its image quality and dynamic range are truly impressive."

While there will always be a place for film, the AJ-HDC27V's 24-frame- and variable-frame-rate progressive HD capabilities offer storytellers a remarkable new tool to express their vision. To find out more about the AJ-HDC27V and other HD Cinema products, call 1-800-528-8601 or visit www.panasonic.com/hdcinema.

Panasonic
The difference is your image.
# Product Index

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Powerful, sleek and reliable. Miranda's Network Series Routing Switchers offer cost effective compact packages in a complete range of analog, digital, audio, video, HD and telecom routing switchers. So compact, they can easily be mounted in the rear of a rack, reducing used rack space to zero. Easy installation and maintenance free, Network Series Routing Switchers are available in sizes of 16x2 up to 128x2, 8x8, 16x16, 32x32 and 64x64. Switch today for the flexibility you want in the size you need.
### Product Directory

The Product Directory is the next step in finding the right product for your project. The listings in this section are divided into general product categories, each containing a listing of manufacturers that provide those products or services. The category headings are color coded and easily visible to take you quickly to the general section to find manufacturers that make your product. In each category, there are several product types listed in italics under the category heading, to help you more easily find the specific type of product you are looking for.

### Audio Accessories

- **Includes:** Acoustic materials; Audio accessories; Audio codecs; Audio meters; Audio monitor amplifiers; Audio patch panels; Headphones; Speakers; Surround Sound accessories

#### Aphex Systems
- 818-767-2929

#### ATC
- 609-291-8222
- ATC SCM 100-a SL PRO active 3-way monitor

#### Audio Accessories
- 603-446-3335
- 1/4-inch long-frame and mini pre-wired patch bays

#### Audio-Technica US
- 330-686-2600
- ATH-M40fs
- ATH-D40fs

#### Benchmark Media Systems
- 315-437-6300; 800-262-4675
- SPM 220 and 320 stereo program meters with selectable VU or PPM metering

#### Garwood
- 609-291-8222
- M-pack-hardwired in-ear monitoring system

#### Horita Co.
- 949-489-0240
- AM-50 audio meter

#### Logitek Electronic Systems
- 713-664-4470; 800-231-5870
- Ultra VU high-resolution analog/digital LED meter

#### Multidyne Video & Fiber Optic Systems
- 516-671-7278; 800-4TV-TEST
- AIA 8x8 XLR breakout panel

### Audio Mixers

- **Includes:** Portable mixers; Studio mixers

#### AMS Neve
- 212-965-1400; 888-888-6383
- Libra Live Series II
- Libra Post digital mixing console
- Logic 7 digital console

#### Audio-Technica US
- 330-686-2600
- SmartMixer

#### Calrec
- Alpha 100 digital console
- +44 1422 842 159
- Alpha 100 digital console

---

**Sony Electronics**
- 800-686-SONY
- AMS-100

**Shure**
- 847-866-2200; 800-25-SHURE
- E-5 universal earphone

**Ward-Beck Systems Ltd.**
- 416-335-5999; 800-771-2556
- MP meter panel series

**Wave:Space**
- 949-770-6601
- WM15B high-power studio monitor system

**Zandar Technologies**
- 321-939-0457
Product Directory

**Euphonix**

System 5 digital console
650-855-0400
CS3000 analog console
System 5 digital console

**Logitek Electronic Systems**
713-664-4470; 800-231-5870
Numix modular digital console

**Shure Inc**
847-866-2200; 800-25-SHURE
FP-24 portable battery mixer

**Solid State Logic**
212-315-1111

**Wheatstone Corp.**

TV-80 audio console
252-638-7000
SP-8 audio console
TV-80 audio console
TV-1000 audio console

**Audio Processing**

Includes: Audio compressor/expanders; Audio effects systems

**Aphex Systems**
818-767-2929
Big Bottom Pro plug-in

**Dolby Laboratories**
415-645-5000; 800-33-DOLBY
DP-569 multichannel encoder
DP-579 Dolby E tri-level interface
DP-570 multichannel audio tool
DP-571 Dolby E encoder

**Shure**
847-866-2230; 800-25-SHURE
DP11EQ digital dynamics processor

**Audio Recording**

Includes: Audio playback devices; Audio RAM recorders; Audio recorders/players (ATR, MD, etc); Disk recorders (audio)

**360 Systems**
818-991-0360
Digicart II Plus
Instant Replay
TCR4
TCR8

**Euphonix**
650-855-0400
FC726 digital audio format converter
FC727 digital audio format converter w/Pro Tools compatibility

**Mackie**
800-898-3211
MDR24/96 24-bit/24-track hard disk recorder

**RCS**
914-428-4600
Sounder TV instant audio for TV

**Ward-Beck**

Get Connected
Ward-Beck
Toronto Ontario Canada
800 271 2556
Portland Oregon U.S.A
866 271 2556

www.ward-beck.com

Circle (107) on Free Info Card
Audio Routing
Includes: Audio A/D-D/A converters; Audio compression/encoding equipment; Audio DAs; Audio routers; Audio/video mux/embedding equipment; Sample rate converters

Aphex Systems
818-767-2929

Axon Digital Design
+31 13511 6666
AEB-221/ADB-122 embedder/de-embedders

Benchmark Media Systems
315-437-6300; 800-262-4675
AD-104 24-bit A/D converter

Chyron Corp.
516-845-2000
Pro-Bel Eclipse, Freeway, MADI and new Axis routing switches

Crystal Vision Ltd.
+44 1223 506 515
Aada41GR/M analog audio DA
Dada208 digital audio DA

Datatek Corp.
908-654-8100; 800-882-9100
D-2800 router

Ensemble Designs
530-478-1830
Serial Box digital component video converters

Euphonix
650-855-0400
PMI Model Two HDCD processor

Evertz Microsystems Ltd.
905-335-3700
7720AD-HD HD AES audio de-embedder
7720AD-SDI AES audio de-embedder

Fortel DTV
404-885-9555
DAS-441 audio tracking delay

Image Video
416-750-8872
XAES AES routing switcher

KeyWest Technology
913-492-4666; 800-331-2019
Voo Doo series A/D-D/A converters

Kings Electronics Co.
803-909-5000; 888-909-5551
Micro-mini audio interconnect audio jackfield

Klotz Digital America
678-966-9900
VADIS 880

Leitch
757-548-2300; 800-231-9673
Via 32 analog audio router

Link Electronics
573-334-4433; 800-776-4411
AVS-816 audio/video analog/digital switchers

Logitek Electronic Systems
713-664-4470; 800-231-5870
64x64 digital router
Logitek audio engine

MicroVideo Ltd.
+44 1223 834 119
Series 200 audio converters, mixers and embedder modules

Miranda Technologies
514-333-1772; 800-224-7882
Network series routing switchers

Multidyne Video & Fiber Optic Systems
516-671-7278; 800-4TV-TEST
AAGC-200 audio automatic-gain DA

Network Electronics AS
+47 33 48 99 99; 800-877-8273
AV-MUX audio embedder

PESA Switching Systems
631-845-5020; 800-328-1008
Tiger 144x144 routing switcher

Pixel Instruments Corp.
408-871-1975
AD-3000 audio synchronizer

Sierra Video System
530-478-1000
Digilink modular terminal equipment

Sigma Electronics
866-569-2681
DMA-2180 AES/EBU monitoring

Stagetec

Nexus Star digital router
+N 49 951 972 25 25
Nexus Star digital router

Utah Scientific
801-575-3770
Utah-400, Utah-300, Utah-200 routing switcher

Ward-Beck Systems Ltd.
416-335-5999; 800-771-2556
82 series rackmount frame
Performance & Support

When you really get down to business, it makes sense to talk to Calrec.

Calrec produce **DIGITAL** and **ANALOGUE BROADCAST CONSOLES** for the 21st century. Through Network Operations, Local Stations and Independent Remote production companies, America listens to Calrec every day. In our 35 years of experience in Broadcasting, we have continuously pushed the boundaries. Our craftsmanship and cutting edge technology produce the highest quality products, backed by an unrivalled support team. A growing number of Broadcasters are choosing Calrec based on the performance of our products and our people.

WHEN YOU REALLY GET DOWN TO BUSINESS, IT MAKES SENSE TO TALK TO CALREC.

**FOR FURTHER INFORMATION CONTACT**

**Studio Consultants (New York)**
Telephone: (1212) 586-7376  Fax: (1212) 582-2169 e-mail: scidoug@aol.com

**Redwood (LA & Nashville)**
Telephone: (615) 871-0094  Fax: (615) 872-7080 e-mail: redwood@isdn.net

**CALREC AUDIO LIMITED**
Nuthclough Mill, Hebden Bridge, West Yorkshire, HX7 8EZ, UK
Telephone: +44 (0) 1422 842159, Fax: +44 (0) 1422 845244 E-mail: enquiries@calrec.com Website: www.calrec.com
Wheatstone Corp.
252-638-7000
BRIDGE 2001 digital audio router

Automation Systems
Includes: Asset management systems; Master control switchers; PSIP and DTV data encoders; TV business automation (traffic systems); TV facility automation; TV news automation systems

Aglievision

AGV-1000 MPEG master control switcher/server
609-514-4032
AGV-1000 MPEG master control switcher/server

Associated Press
202-736-1100; 800-821-4747
ENPS electronic news production system

BUF Technology
858-451-1350
Spot server management system

Chyron Corp.
516-845-2000
Pro-Bel automation

Comprompter
608-785-7766; 800-785-7765
ENR newsroom automation
NewsKing newsroom automatic

Crispin Corp.
919-845-7744
RapidPlayX news and commercial playback system
AssetBase 2000 database

DNF Controls
818-898-3380
3040 multi-playlist playback

Encoda Systems
303-390-8239
DAL Channel Manager automation
DAL Linkserver automation

FloriCal Systems
352-372-8326
AirBoss NT multichannel automation system
Media Timer program data capture
Show Timer satellite program acquisition

Harris Corp., Broadcast Communications Div.

Imagine Products
317-843-0706
Image Mine media asset management

Inscriber Technology
519-570-9111; 800-363-3400
Automation graphics

Leightronix
517-694-8000
TCD/IP video system controller

MassTech
MassStore asset management system
MassControl TV automation system
MassNDCP TV automation system

MATCO
408-353-2670; 800-348-1843
MA-204B playback automation

Norpak Corp.
613-592-4164
Analog, serial digital, HDTV and MPEG-2 encoders

NSI - (N Systems Inc.)
410-964-8400
MC5 PC-based touchscreen remote control system

Odetics Broadcast
714-774-2200; 800-933-0339
AORO multichannel automation system
Bowser visual asset manager
Roswell content management system

Omneon Video Networks
408-585-5100
Networked Content Server System

Omnibus Systems
530-470-1700
GAMMA asset management system
GIBITARIAN
Workflow Manager

Broadcast Manager central monitoring
800-622-0022
B.R.A.I.N centralized automation
Broadcast Manager central monitoring
PSIP Plus management system
NDCP network device control
**Product Directory**

**ParkerVision**  
904-737-1367; 800-532-8034  
PVT Studio News newsroom automation system  
PVT WEBSTATION for News automation system

**Pinnacle Systems**  
650-526-1600  
DekoCast CG

**SGI (Silicon Graphics Inc.)**  
650-960-1980  
Asset Management

**SignaSys**  
408-998-8053  
Centralized Broadcasting Solutions

**Sundance Digital**  
972-444-8442  
FastBreak automation  
Intellisat broadcast recording manager  
SalesView media browser

**Telestream**  
530-470-1300; 877-CLPMAIL  
FlipFactory media delivery system

**THOMSON Multimedia Broadcast & Network Solutions**  
800-962-4287  
Saturn master control switcher  
Jupiter control system

**Triveni Digital**  
609-716-3505  
Guidebuilder automated PSIP stream generation  
Streambridge ATSC translator for PSIP data

**Utah Scientific**  
801-575-3770  
Max master control automation  
MC-2020  
MC-500

---

**Videoframe**  
530-477-2000  
VTECS control frame/signal monitoring system

**Videomedia**  
208-762-4162  
VIP suite of U-LAW applications

**vi(2)rt**  
212-560-0708  
Pilot asset management system for graphics control

---

**Cable TV Equipment**  
Includes: Broadcast cable equipment; CATV system components

**Artel Video Systems**  
508-303-8200; 800-225-0228  
Broadcast cable  
CATV systems

**BarcoNet**  
770-590-3600; 800-992-5016  
Galaxy digital rack system  
Triton IRD

**Intelvideo**  
203-348-9229  
VP50A noise reducer/ghost canceler

**Opticomm Corp.**  
858-450-0143; 800-8-OPTICOMM  
DVX-5000 broadcast SDI/DTV fiber system

**Qwest Digital Media**  
615-650-6000  
Uplink and transmitter facility

**Sierra Video System**  
530-478-1000  
Tahoe routing switcher  
Yosemite routing switcher

---

**Standard Communications Corp.**  
310-532-5300  
SDR422 CI digital receiver  
Stratum II modulator

**Triveni Digital**  
609-716-3505  
Streambridge ATSC translator for PSIP data

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

**Camplex Corp.**  
316-342-7743  
CP-301B  
CP-501

**NSI - (N Systems Inc.)**  
410-964-8400  
Cam Pac remote camera system

**ParkerVision**  
904-737-1367; 800-532-8034  
Analog Cameraman

**Radamec**  
877-723-2632; 877-RADAMEC  
Camera Robotics touchscreen control system  
HD Scenario

**Shotoku Camera Support Systems**  
661-775-7736; 866-746-8658  
TE-12HA cam head

**Telemetrics**  
201-848-9818; 800-424-9626  
EP-PT elevating pedestal
Vinten
914-268-0100; 888-2-VINTEN
IS-9000IT ImageTracker
SP-2000-X/Y servo pedestal
Quattro Z servo/manual studio pedestal
HCP-8000 control system

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

AVEC
412-429-2000
Camera Caddy

Bogen Photo Corp.

Manfrotto 503/505
201-818-9500
Gitzo GB80 CFKIT
G1338 w/1380
Manfrotto 500 series pro video heads
Manfrotto 540 tripod

Digital Video Conversion and Interface Products by AJA Video

**PCI Cards**

- HD-NTV PCI Bus HD-SDI Video Interface/Framestore
  - $7,900
- SD-NTV PCI Bus SDI Streaming Video Interface
  - $2,295

**Miniature Converters**

- HD10C HD-SDI D/A Converter w/SVGA Mode*
  - $2,495
- HD10M HD Analog to NTSC Monitoring Downcnvrtr.*
  - $800
- D10C SDI to Component Analog Converter, 10-bit*
  - $800
- D10A Component Analog to SDI Converter, 10-bit*
  - $1,200
- D4E Serial Encoder, SDI to NTSC/PAL or Y/C*
  - $250
- D5CE Serial Encoder, SDI to NTSC/PAL w/Component*
  - $375
- D5D Decoder, 3-line Comb Filter, NTSC/PAL to SDI*
  - $595
- DWP Power Supply, 110 Volt (*requires power supply)
  - $40

**Rack Mount Products**

- R20D Decoder, 5-line Comb, NTSC/PAL to SDI, 10-bit
  - $1,300
- R20E Encoder, SDI to NTSC/PAL or Component, 10-bit
  - $1,300
- FSG Frame Sync/Genlock Module (fits R20E/D Cards)
  - $600
- R44E Four Channel SDI to NTSC/PAL Converter
  - $990
- RDSAD Dual Universal A/D Converter
  - $1,600
- RDSCE Dual Universal D/A Converter
  - $1,300
- R5CE Universal Monitoring Distribution Amp, 1X4
  - $590
- FR1D 1-RU, Forced-Air Cooled, 4-Slot Frame, Dual Power Supply
  - $895
- FR2D 2-RU, Forced-Air Cooled, 10-Slot Frame, Dual Power Supply
  - $1,490

www.aja.com
toll free 800-251-4224
international 530-274-2048

Circle (109) on Free Info Card

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<td>973-857-8300</td>
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<tr>
<td>&quot;Sprinter&quot; series tripods</td>
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<tr>
<td>Miller fluid heads</td>
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<td><strong>Music 2 Hues</strong></td>
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<td>888-821-7515</td>
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<tr>
<td>55L aluminum tripods</td>
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<tr>
<td><strong>O'Connor Professional Camera Support Systems</strong></td>
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<td>714-979-3993</td>
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<tr>
<td>25L, 55L carbon tripods</td>
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<td><strong>Radamec</strong></td>
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<td>877-723-2632; 877-RADAMEC</td>
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<td>433 Weather-Cam</td>
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<td>RP2A robotic camera pedestal</td>
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<td><strong>RF Technology</strong></td>
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<td>203-866-4283; 800-762-4369</td>
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<tr>
<td>Remote &quot;Beauty&quot; camera systems</td>
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<tr>
<td><strong>Sachtler Corporation of America</strong></td>
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<tr>
<td>516-867-4900</td>
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<tr>
<td>Tripods</td>
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<tr>
<td>Pan/tilt heads</td>
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<tr>
<td><strong>Shotoku Camera Support Systems</strong></td>
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<td>661-775-7736; 866-746-8658</td>
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<td>TP-66 studio pedestal</td>
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<td><strong>Telemetrics</strong></td>
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<tr>
<td>201-848-9818; 800-424-9626</td>
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<tr>
<td>PT-CP-S2 serial compact pan/tilt head</td>
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<td>PT-LP-S3 serial studio pan/tilt head</td>
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VPS-400D switcher

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HVC-555, HVC-680, HVC-65 upconverters and downconverters

**KeyWest Technology**
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**MicroVideo Ltd.**
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**Panasonic Broadcast**
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WJ-MX50A production mixer

**Pinnacle Systems**
650-526-1600
DVEXCEL
DVEXtremePlus
PDS 6000 compact digital production switcher
PDS 9000 2.5ME, 10-bit component digital live production switcher
Digital XPoint—The new line of digital matrix switchers from Extron Electronics. The Digital XPoint matrix switcher line is the ideal solution for switching multiple serial digital video devices to multiple digital video devices in production studios, staging applications, non-linear editing suites, and broadcast studios.

Currently, the Digital XPoint line includes two models: the DXP 88 SDI (eight input, eight output) model and the DXP 44 SDI (four input, four output) model. Digital XPoint matrix switchers come standard with front panel control. Remote control is available using Extron’s remote keypad (MKP 1000) and/or remote control panel (MCP 1000). Control using a third party control system can be done via RS-232, RS-422, or ethernet.

Features:
* Inputs with equalized and buffered loop-throughs
* Outputs on two buffered and re-clocked BNCs
* Automatic rate selection—the matrix can automatically accept four SMPTE 259M data rates, including: 143, 177, 270, 360 Mb/s. It’s capable of switching 4:2:2 (component) serial digital video transmission standards
* Automatic input cable equalization—typically equalizes greater than 300m at 270 Mb/s of Extron SHR or equivalent high quality cable
* Digital Sync Validation Processing (DSVPTM)—when input serial data is locked, the matrix indicates the presence of a carrier source and data rate
* 16 global memory presets
* Ethernet Control—Supports browser-based control of common operations via TCP/IP, the primary communications method on the Internet, by utilizing existing network architecture
* Extron’s Simple Instruction Set (SIS™) for easy to use RS-232 control

For complete details, visit Extron’s Web site at: www.extron.com/64/digitalxpoint
Synergy
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Synergy I
210A

Snell & Wilcox
408-260-1000; 800-827-4544
HD2524 production switchers

Sony Electronics
800-686-SONY
HDS-7150 1.5M/E production switcher

ULTIMATTE Corp.
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Ultimatte-HD
Ultimatte-400
Ultimatte-9

Videotek
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Marconi Applied Technologies

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Solid rod towers

Radian Communications Services Corp.
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ViewMAX automatically locks to the incoming video and processes the image to generate broadcast quality NTSC or PAL outputs including composite, RGB, S-Video (Y/C) as well as serial digital component 4:2:2 (SDI) video. ViewMAX products are designed for professionals who require the highest image quality, high reliability, and control over all aspects of the down-conversion process. The user interface is designed with a large display and interactive menus to provide full control with MINIMAL FUSS.

ViewMAX products offer the following features:

- Automatically syncs to interlaced and non-interlaced sources with resolutions up to 1600x1280
- Accepts video in RGB, Y, Pb, Pr (HDTV) or digital (DVI) format
- User selectable output formats including NTSC or PAL, RGB, Betacam, S-Video (Y/C), and digital (SDI) video
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- User-selectable under-scan
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- Multiple frame buffers eliminate frame conversion rate

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<td><strong>Advent Communications Ltd.</strong></td>
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<td><strong>GMPCS Personal Comm.</strong></td>
<td>954-973-3100; 888-664-6727 Satellite receivers and antennas</td>
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<td><strong>Marconi Applied Technologies</strong></td>
<td>914-592-6050; 800-342-5338 N6310/2/5/8 DUA KU-band amplifiers Stellar range KU-band amplifiers</td>
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December 15, 2001
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Specifications:
- Model 53 [4.5 ... 1000 MHz, -72 ... +20 dBm]
  (w/ option EFA-B3, RF Preselection)
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- Pilot Value
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- FCC Shoulder

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**Intelvideo**
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SDI-100 10-bit SDI-to-analog converter

**Leitch**
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VFS-6801 10-bit serial 4:2:2 frame synchronizer

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Frame synchronizers for digital video

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ARC-371/372p aspect ratio converters
ASD-231i 12-bit NTSC/PAL-to-4:2:2 decoder/frame synchronizer with TBC
ASD-301NI NTSC-to-4:2:2 decoder/frame synchronizer with TBC
SDM-301NI 4:2:2-to-NTSC converter
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**Panasonic Broadcast**
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**Prime Image**
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**Video Accessories**

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

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

**Complex Corp.**
316-342-7743

**D.W. Electrochemicals Ltd.**
905-508-7500
Stabilant 22 electronic control enhancer active resident treatment for connectors

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

**Drastic Technologies Ltd.**
416-255-5636
MediaReactor Active X SDX media reactor file conversion
MediaReactor NLE file conversion software for digital media

**Evertz Microsystems Ltd.**
905-335-3700
5010-GPSII-5010

---

**Iffech Telecommunications**
818-361-2248
DCC-200 8-VSB digital channel converter
VSB-ENC-200 opt 325 8-VSB modulator
VSB-FRQ-200 8-VSB-to-ASI and SMPTE-310M converter with PSIP update capabilities
XMT-100 low-power DTV 100W average transmitter

**Northrop Grumman Electronic Systems**
570-326-3561 x201; 800-861-1843
L-4201 oil-cooled CEA and circuit assembly designed for DTV transmitters
L-4480T high-efficiency tube and circuit for VHF transmitters

**RFS Broadcast**
203-239-3311

**Rohde & Schwarz**
410-910-7800

**Screen Service Italia**
+39 03 03730773
Analog and digital TV exciters
Analog and digital TV transmitters up to 60 kW

**SpectraSite Broadcast Group**
972-550-9500

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• Reduced Rack Space Requirements - a 160x160 Matrix in just 8 rack units, 320x320 in only 16 rack units, 640x640 in 48 rack units - The UTAH-400 lets you put more switcher in less space than any router in history.

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• Reduced Power Consumption - The UTAH-400 uses up to 80% less power than competitive designs. In large systems, this can add up to real operational savings.

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• Advanced Digital Audio Routing Capabilities - The UTAH-400 digital audio matrix gives you complete flexibility in handling any digital audio format.

Utah Scientific has a full range of solutions to the most demanding requirements for audio and video routing and presentation systems. Let us help you find your way through the maze of options to the most cost-effective and future-proof digital signal management plan for your facility. Visit us at www.utahscientific.com or call (801) 575-8801 today for more information.
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<td>845-339-9555; 800-898-0759</td>
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<td>LTM-5500 DV media converter</td>
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<td>PatchAmp</td>
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<td>201-457-1504</td>
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<td>Screen Subtitling Systems</td>
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<td>+44 1473 831 700</td>
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<td>Agilevision</td>
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<td>609-514-4032</td>
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<td>AGV-1000</td>
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<td>Digital Vision (US)</td>
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<td>818-769-8111</td>
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<td>BitPack HDTV/SDTV offline encoders</td>
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<td>Harris Corp., Broadcast Communications Div.</td>
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<td>800-622-0022</td>
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<td>Intelvideo</td>
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<td>203-348-9229</td>
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<td>VP10 noise reducer</td>
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<td>Vela</td>
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<td>Argus media encoder</td>
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Products: Addresses: web URLs:

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Product Directory

Video Editing Systems
Includes: Editing systems and components; Nonlinear editors

Accom
650-328-3818
Affinity
Affinity/SAN
Axial 3000

Applied Digital
352-338-0516
Segmenter MPEG cuts-and-trim editor

Avid Technology
978-640-6789; 800-949-AVID

BOXX Technologies
512-835-0400; 877-877-2699
HD BOXX

BUF Technology
858-451-1350
VTC-4000 multiple VTR/DDR controller

Discreet

DVORA media engine
845-339-9555; 800-898-0759
DVORA media engine

DNF Controls
818-898-3380

Editware
530-477-4300
DPE-500 series linear hybrid editing controllers
Fastrack series nonlinear/hybrid editing systems

Imagine Products
317-843-0706
DV Log Pro
Executive Producer

Incite Multimedia Corp.
+41 22 308 57 57; 800-641-7322
Incite Editor

JEMS Data Unlimited
603-896-6319; 800-838-JEMS
JEMINI Cougar
JEMINI Fire Vault-Firewire

Laird Telemedia

DVORA media engine
845-339-9555; 800-898-0759
DVORA media engine

Leitch
757-548-2300; 800-231-9673
dpsVelocity real-time nonlinear editing system

Matrox Electronic Systems - Video Products Group
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**Media 100**
508-460-1600; 800-773-1770
iFinish
Media 100i

**Panasonic Broadcast**
800-528-8601
DNA newsroom production system
newsBYTE50 NLE system

**Pinnacle Systems**
650-526-1600
blue
CineWave
Commotion Pro
Pinnacle Pro professional video editing/authoring system
purple
silver
TARGA 3000
TitleDeko Pro

**Pixel Power**
561-395-4801; +44 1223 721000
Collage 2 nonlinear editor

**Pixelan Software**
360-647-0112
Spice Master Deluxe

**Quantel**
212 944 6820
iQ HD and 2K production system
Henry Infinity finishing system

**Sony Electronics**

DNW-A220
800-686-SONY
XPRI content creation system
DNW-A220

ULTIMATTE Corp.
818-993-8007
Ultimatte plug-in
Ultimatte compositing

**Videomedia**
208-762-4162
O2-PCE professional online editing

**Video Monitors**
Includes: DLP projectors; Line doublers/quadruplers; Plasma displays; Projectors; Video monitors; Video presentation equipment; Video walls

**Aspen Electronics**
714-379-2515

**Astro Systems**
818-848-7722
DM-3002 15-inch HD LCD monitor
DM-3000 6-inch HD LCD monitor

**BarcoNet**

ADVM monitors
770-590-3600; 800-992-5016
ADVM series of hybrid analog/digital monitors

**CTX International**
626-709-1000

**Da-Lite Screen Company**
219-267-8101; 800-622-3737
Model 500 portable overhead projector
G-200, G-200-VC classroom overhead projectors
Reflex video wall

**Extron Electronics**

USP 405
714-491-1500; 800-633-9876
714-687-6398
USP 405 line doublers/quadruplers

**Folsom Research**
916-859-2500; 888-414-SCAN
Audio and video seamless switcher

**Ikegami Electronics**
201-368-9171
HTM-50 series HDTV monitors
TM-20 and TM-17 series color monitors
PM B&W series monitors

**JVC**
800-JVC-5825
DT-V1700CG HD broadcast monitor

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[www.broadcastengineering.com](http://www.broadcastengineering.com)
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**Model: VSB-FRQ-200**
8-VSB to ASI/SMPTE-310M Converter
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- Outputs: SMPTE-310M, DVB-ASI
- PCR Correction
- PSIP Update (VCT, Station ID, Major CH No, Minor CH No)
- Simultaneously Converts 8-VSB RF to DVB-ASI and SMPTE-310M
  - DVB-ASI to SMPTE-310M
  - SMPTE-310M to DVB-ASI
- Alarm & Status
- RS232C Remote Control

**Model: VSB-ENC-150E**
Low Cost 8-VSB Modulator
- Inputs: DVB-ASI, SMPTE-310M
- Outputs: 44MHz I.F 8-VSB, RF (Tuneable 55MHz-858MHz, Adjustable Power level), DVB-ASI, SMPTE-310M
- PCR Correction
- PSIP Update (VCT, Station ID, Major CH No, Minor CH No)
- Simultaneously Converts DVB-ASI to SMPTE-310M
  - SMPTE-310M to DVB-ASI
- Alarm & Status
- RS232C Remote Control
- Built-in 23 stage PN Generator for BER testing
- PLL Lock Detector indicates MPEG2 valid
- SNR: 37dB Typical

**Model: DCC-150E**
DTV Channel Converter
On-Air reception of 8-VSB signal and 8-VSB Remodulation to another CATV Channel
- Inputs: 8-VSB RF, DVB-ASI, SMPTE-310M
- Outputs: 44MHz I.F 8-VSB, RF (Tuneable 55MHz-858MHz, Adjustable Power level), DVB-ASI, SMPTE-310M
- PCR Correction
- PSIP Update (VCT, Station ID, Major CH No, Minor CH No)
- Simultaneously Converts 8-VSB RF to DVB-ASI and SMPTE-310M
  - DVB-ASI to SMPTE-310M
  - SMPTE-310M to DVB-ASI
- Alarm & Status
- RS232C Remote Control
- Built-in 23 stage PN Generator for BER testing
- PLL Lock Detector that indicates a valid MPEG2 signal

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Phone (818) 361-2248 Fax (818) 270-2010
E-Mail: sales@ktechtelecom.com Web: http://www.ktechtelecom.com

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Panasonic Broadcast
800-528-8601
AT-H317W 1080i/720p/480p/480i HD monitor

Sony Electronics

Sony PFM-42B1 flat-panel plasma monitor
800-686-SONY
BVM-F24U CineAlta monitor
PFM-42B1 flat-panel plasma monitor

Video Routing & Distribution
Includes: Control signal routers/patch panels; Video DAs; Video processing amplifiers; Video routing switchers

AJA Video Systems
530-274-2048; 800-251-4224

Analog Way
212-269-1902

Astro Systems
818-848-7722
SD-1645 HD repeater

AutoPatch
800-622-0246
Modular series of routing switchers

BUF Technology
858-451-1350
BUF ROUTE routing switcher controller

Burst Electronics
505-898-1455
VDA-2EQ

Crystal Vision Ltd.
+44 1223 506 515
DDA108 SDI DA
VDA210R/M analog video DA

DNF Controls
818-898-3380

Ensemble Designs
530-478-1830

ESE
310-322-2136
ES-297A 1x4 video DA

Evertz Microsystems Ltd.
905-335-3700
7700ADA analog equalizing DA for HD
X-1202S 12x12 SDI video router

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

Fortel DTV
404-885-9555

Grass Valley Group
800-824-5127
Kameleon AV modular router
7500 wideband digital router
7500 narrowband digital router

Image Video
416-750-8872
XDS 1601 serial digital router

KeyWest Technology
913-492-4666; 800-331-2019

Laird Telemedia
845-339-9555; 800-898-0759
LTM-ER4 multiformat router

Leightronix
517-694-8000
PRO-16

Link Electronics
573-334-4433; 800-776-4411
AVS-816
Frame synchronizer
PDP-886D
PRC-970

MicroVideo Ltd.
+44 1223 834 119
PROC 200

Miranda Technologies
514-333-1772; 800-224-7882
Network series video, audio, HD and telecom routers

Multidyne Video & Fiber Optic Systems
516-671-7278; 800-4TV-TEST
VAGC-200 video automatic-gain DA

Netcom
201-837-8424
Patchamp series routing

Network Electronics AS
631-928-4433; 866-928-4433
GYDA advanced control and monitoring card for Flashlink
THOR router management system
Product Directory

PatchAmp
201-457-1504

PESA Switching Systems

Tiger video routing switcher
800-328-1008
Tiger, Cougar, Ocelot video routing switchers

Ross Video
613-652-4886
RossGear

Sierra Video System
530-478-1000
Digilink modular terminal equipment - connectors, distribution amplifiers and synchronizers
Shasta HD
Sierra Pro
Tahoe - 16x16 up to 48x48
Yosemite

THOMSON Multimedia Broadcast & Network Solutions
800-962-4287
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Trinix, Venus, Triton routing switchers

Trompeter Electronics
818-707-2020; 800-982-2629

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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
Abekas 6000
APR-Attaché
WSD/HD
WSD-2Xtreme

**Adtec Digital**
615-256-6619

**Aglievision**
609-514-4032
AGV-1000

**AJA Video Systems**
530-274-2048; 800-251-4224

**Applied Digital**
352-338-0516
ADnet ad insertion system

**Avica Technology Corp.**
310-450-9090

**Avid Technology**
978-640-6789; 800-949-AVID

**AVS Graphics & Media**
801-975-9799
Stillbank

**BUF Technology**
858-451-1350
Spot server management system

**Doremi Labs**
818-562-1101
V1bx2 dual-channel disk recorder
V1 MJPEG disk recorder
V1-Server multichannel video server

**Fast Forward Video**
949-852-8404
Alpha One digital still store
Omega deck digital disk recorder

**For-A**
352-371-1505
LDR-200 live disk recorder

**Grass Valley Group**

**Vibrint/Profile platform**
800-824-5127
Media Area Network real-time shared storage system
Profile XP Media Platform
Vibrint/Profile platform

**Imagine Products**
317-843-0706
Image Mine

**Inscriber Technology**
519-570-9111; 800-363-3400
E-Clips server

**Leightronix**
517-694-8000
MVP-2000

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**Utah Scientific**

Utah-300 digital/analog router
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DOS-2
Utah-400, Utah-300, Utah-200, Utah-1500 digital/analog routers

**Vela**
801-464-1600
IDS intelligent distribution series compact routing switcher

**Videotek**
610-327-2292; 800-800-5719

**Ward-Beck Systems Ltd.**
416-335-5999; 800-771-2556
8200 series analog and digital audio and analog video DAs and converters

**Alpha One digital still store**
Omega deck digital disk recorder

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Product Directory

Lelitch

VR server system
757-548-2300; 800-231-9673
VR445 broadcast server
VR technology family

MATCO
408-353-2670; 800-348-1843
MA-500M video server

Medea Corp.
818-597-7645; 888-BY-MEDEA
VideoRaid FCR

Odetics Broadcast
714-774-2200; 800-933-0339

Omneon Video Networks

Extended file system
408-585-5100
Extended file system

Panasonic Broadcast
800-528-8601
AJ-HD3700HD-5 multiformat, multi-standard mastering VTR
AJ-HD150 DVCPRO HD studio VTR
AJ-D950 DVCPRO50 studio VTR
AJ-HDR150 HD/SD multiformat DVCPRO video server

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<td>Pixel Power</td>
<td>561-395-4801; +44 1223 721000</td>
<td>Graphic 2 CG</td>
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<td>Collage 2 still store</td>
<td>Clauter TG-SD and TG-HD text generator and on-air playout system</td>
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<td>Graphic 2 CG</td>
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<td>SeaChange International</td>
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<td>BMC 1650 digital media server</td>
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<td>Broadcast MediaCluster</td>
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<td>SGI (Silicon Graphics Inc.)</td>
<td>800-800-7441</td>
<td>Origin 300 media server</td>
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<td>Sony Electronics</td>
<td>800-686-SONY</td>
<td>MAV70 on-air playout server</td>
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<td>DNW1A100</td>
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<td>MAV555 production server</td>
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<td>Media Machine DVD-RAM archiving</td>
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<td>SGI Electronics</td>
<td>800-800-7441</td>
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<td>Belden Electronics Div.</td>
<td>765-983-5200; 800-BELDEN1</td>
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<td>Clark Wire &amp; Cable</td>
<td>847-949-9944; 800-CABLE-IT</td>
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<td>Comprehensive Video Group</td>
<td>800-526-0242</td>
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<td>Extron Electronics</td>
<td>714-491-1500; 800-633-9876</td>
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<td>Pixel Power</td>
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<td><strong>Product Directorq</strong></td>
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<td>Carry-Coder</td>
<td><strong>PICK OF SHOW</strong></td>
<td>NAB 2001 AWARD WINNER DIGITAL TV MAGAZINE</td>
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<td><strong>COFDM: Now smaller, lighter and lower cost!</strong></td>
<td><strong>PICK HIT</strong></td>
<td>NAB 2001 AWARD WINNER BROADCAST ENGINEERING</td>
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<td>BMS Broadcast Microwave Services, Inc.</td>
<td>P.O. Box 84630 San Diego, CA 92138-4630</td>
<td><a href="http://www.bms-inc.com">http://www.bms-inc.com</a> email: <a href="mailto:sales@bms-inc.com">sales@bms-inc.com</a> 1-800-669-9667</td>
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V37 all-metal DT-12 type connection
VHD 1100 RG-11 type DTV, HDTV coax cable
VPM2000 RG-59 type DTV, HDTV coax cable
VSD201 RG-6 type DTV, HDTV coax cable

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305-899-0900; 800-522-2253
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NE3700 series DT-12 connectors
NE8000 series BNC connectors

**Telecast Fiber Systems**
508-754-4858
Sidewinder fiber-optic ENG/SNG system

**Trompeter Electronics**
818-707-2020; 800-982-2629

**Whirlwind**
716-663-8820; 800-733-9473
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Excellence Awards

23 Top Facilities
Leading Examples of Technology
Readers vote and win
EXCELLENCE AWARDS

This year, the editors of Broadcast Engineering have developed the Engineering Excellence Award. The award recognizes innovation and quality design and construction of production and broadcast facilities. A special report containing 23 examples of leading-edge facilities from around the country follows. From RF to DVD production, these transmitter sites, TV stations and production facilities represent some of the best work of today’s top systems integrators.

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

When voting, consider how well the systems integrator and facility exhibit the following design and application issues:
• Originality/innovation of new or existing techniques
• Complexity of the project
• Presentation, visual attractiveness
• Meeting owner/client goals

Readers win too!

Readers who vote and then enter their e-mail address will be eligible for a Broadcast Engineering t-shirt. Only one vote per reader please. To be eligible for the t-shirt you must provide an e-mail address. Winners will be contacted.

Votes will be taken until Jan. 20, 2002. Three winning facilities/systems integrators will be announced in the March 2002 NAB Preview issue of Broadcast Engineering. The Engineering Excellence Awards will be presented to the winners at the NAB convention.

So read, vote and win!

Brad Dick, Editorial Director
Marshall Space Flight Center

Marshall Television, located at Marshall Space Flight Center in Huntsville, AL, is one of many centers that can originate program content on NASA TV. The facility currently utilizes standard definition system but all acquisition and editing is carried out in the digital domain. The NASA HDTV team is currently evaluating HD equipment and the Marshall TV facility will soon be migrating towards the new standards.

As part of the facility upgrade, the Marshall TV engineering staff was tasked with replacing the existing audio mixing console with a broadcast console that would accommodate current needs as well as address future requirements. The new console needed to be easily integrated into the present facility, be upgradeable to address future standards, provide ease of operation for live broadcast productions, offer a true electronic signal pathway, and provide a modular design for future upgrades through module replacement.

Marshall chose Wheatstone's SP-8 Series Audio Console to function as the main audio board for center broadcasts on NASA TV, as well as routing audio for internal live and taped productions. The Wheatstone SP-8, a 24x8 console, will be located in the audio control room.

The failure of the old console was due to the audio signals going through sealed, self-cleaning switches and faders. In the days when all of the channels of the console were constantly in use, this was acceptable, but as the entire console was not needed and the switches were not used as much, this became a major problem. Corrosion built up in the unused sealed switches leading to loss of signal and interrupting productions. This interference was especially disruptive during live productions. A decision was made to find a console that had a total electronic path so the signal would not be routed through switches.

The Wheatstone SP-8 audio console fast mix-minus system allows individual fold packs to keep live programming moving smoothly. The console has ample monitoring capability and can feed a control feed system as well as multiple studio outputs. The entire audio program path is electronically switched to provide reliable operation.

Wheatstone worked with the specifications provided by Marshall TV's engineering staff, and phase one of the project is nearly complete.
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*We’re well on our way to being anywhere you need us to be. From sea to shining sea.*
NY1, Time Warner Cable's 24-hour New York City news channel, chose A.F. Associates to provide full systems integration and engineering design for its new expanded facility relocating to Chelsea Market on Manhattan's West Side. The new facility is scheduled to launch in February of 2002.

Primary goals for the new facility were to create a tapeless multichannel 24-hour news facility and to utilize video server technology that could be accessed at the desktop for viewing and editing by field reporters and production personnel. The new facility would also have to be highly automated to utilize manpower efficiently, have high ceilings for studios, a DVCPRO format, the ability to transmit and receive capability on site, have access to fiber-optic connectivity, and double the current facility's space in order to allow for future growth.

The design criteria involved building a state-of-the-art facility utilizing the latest technology. This became a reality when the location at Chelsea Market became available. The space, which had been part of the original Nabisco's Oreo cookie factory, offered 33-foot high ceilings, column-free space for studios, roof space for satellite and microwave dishes, and panoramic views of the city. The space was large enough to support 350 tons of A/C units, one 675 kW generator, six satellite dishes and a production platform.

Working with the Time Warner Cable News Group of Stamford, CT, NY1 News and TWC News' engineering teams, along with A.F. Associates, embarked on a development project to create a 24-hour news wheel automation system utilizing ENPS from the Associated Press, Omnibus Automation, Vertigo Graphics and Pinnacle Servers. The newsroom is based entirely on Media Object Server (MOS) protocol. Pinnacle would also supply its Vortex nonlinear editors, DVEXcels, Deko 2200s and a DekoCast to the project. The new NY1 News facility is also supported by a Thomson/Philips serial digital Venus router, Thomson DD35 switcher and Saturn master control switcher, and Radamec EPO robotics.

The new facility has doubled the station's space, created a better working environment for its personnel, and created a facility that allowed NY1 to offer its services to outside clients.
Today, Acrodyne is an all new transmitter company created by broadcasters, for broadcasters. Our significant investments in new management, intellectual property and new facilities make us the single source RF problem solver – from consulting, to equipment, installation, 24/7 support – even financing.

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National Sales Manager
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Some are calling it a great American comeback story in the making. • The year was 1999. After three decades and over 4,600 transmitters, Acrodyne needed a makeover. So armed with a new broadcaster-focused philosophy, we invested in new products. New management. A renewed commitment to existing Acrodyne customers. And brand new broadcast engineering and manufacturing facilities. • One of the first dividends is Quantum. Managed by the same team that invented OT transmitters, it's a technological Quantum Leap — more reliable and easier to maintain than any transmitter previously on the market. Just in time to meet the DTV transition deadline requirement.

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Maine Public Broadcasting’s television operations center

Maine Public Broadcasting serves the entire state of Maine with seven FM radio stations, five analog television stations, one digital television station, and four studios, all of which are interconnected via 50 plus microwave systems. The studio facilities are configured with Bangor housing the operational master control centers for television and radio.

The state of Maine has a population of 1.2 million people and covers an area larger than all of the rest of New England combined. MPBC serves 99 percent of the state’s population.

The major goal of the project was to implement DTV in the most cost-efficient and manpower-effective manner possible. The specific goal of the project was to design a master control facility that would handle four standard-definition programs, pass high-definition programming, insert PSIP and opportunistic data, and run under automation. Other goals were to insert Maine PBS into the bit-stream in place of one of the streams in the PBS multicast, switch between HD and SD streams, allow branding of all the services, and work in the compressed domain, all without requiring additional manpower.

MPBC needed a way to integrate their existing analog channel into the ATSC bit-stream for their DTV service. At the same time they wanted to pass three of the four DTV channels provided by PBS because they did not have the capacity in their microwave system to pass both the analog and digital signals. They had to get their existing service multiplexed into the digital stream in order to demux it out at the transmitter sites, feed it into an ATSC decoder, extract the video and encode it as an NTSC signal. They intend to handle the HD programming by decoding the HD to an SD signal and then encoding it as NTSC.

MPBC selected the AgileVision 1000 as the cornerstone of their master control facilities. The fact that it allows forms virtual switchers that can be configured on the fly and can brand the services in the compressed domain mode, made it the ideal solution for Maine Public Broadcasting.

The design and use of AgileVision allows MPBC to pass and manipulate multiple program streams provided by PBS. And, since the AgileVision 1000 also serves as a software solution, MPBC has the upgrade path to provide additional services in the future.
Idaho Public Television's KAID-DT

Idaho Public Television (IDPTV) is a statewide network of five full-power NTSC transmitters and 36 translators. It currently has one DTV transmitter located in Boise, but there are plans to construct three more during 2002 and a fourth in 2003. The Boise market serves approximately 450,000 people.

The goals of IDPTV’s KAID-DT facility were to be up and on the air with DTV in a timely fashion and not have to fully rebuild its MC facility at the same time as it built its transmitter plant. Being a PBS affiliate, it knew that it could provide a pass-thru of the satellite-fed “pre-encoded” transport streams, but it wanted its own PSIP, logo and control of those streams.

The AgileVision AGV-1000 was the core technology used for the project. It is fed an ASI stream by satellite receivers with one tuned to the PBS SD 4-channel multicast and one tuned to the HD feed. They monitor the transport stream output prior to distributing the stream for confidence decoding and to their STL link. The receiver offers both ASI and SMPTE-310 outputs at their transmitter site.

The AgileVision product was a good match for many reasons. First, it gave KAID-DT great performance and flexibility options. Secondly, the advanced feature set allowed the crew to experiment and provide services that normally can’t be done in the compressed transport stream arena. Third, the crew foresees options for re-purposing the unit after a full digital rebuild of its MC and distribution facility is complete.

KAIE-DT has had positive results. It has been able to brand each multicast channel and its HD channel uniquely and switch between the two streams. It also has been able to insert accurate PSI/S data right from the start. The main benefit has been identity. KAID-DT had signed on with two other DT stations at the same time and noticed that its PSIP data enabled the set-top box it was experimenting with to tune to its channels much quicker and with less input from the user.

**Studio Specs**

**Design Team**

Peter W. Morrill, general manager of IDPTV
Ron Pisaneschi, director of programming for IDPTV
Rich Van Genderen, director of technology, for IDPTV
Gens Johnson, DTV planning for IDPTV
Ted Poe, KAID chief engineer
Since 1972, Andrew Corp. has been designing broadcast antennas using computer-modeling techniques referred to as near-field measurements. Andrew engineers pioneered many antenna-testing techniques during a time when the norm was to measure data using a far-field test range to prove the horizontal and vertical plane radiation patterns. These computer-aided techniques were particularly important when it came to manufacturing a top-mounted NTSC analog antenna for station KHRR Channel 40.

A Telemundo affiliate, KHRR offers one of the foremost broadcasts of Spanish-language programs in Arizona. When the station's 15-year-old Bogner transmitting antenna started to burn up, speed was of the essence to prevent antenna issues affecting transmission quality. Timing was tight for a standard antenna, and KHRR required a special fully pressurized antenna. An evaluation by an independent consultant of environmental conditions at the transmitter site – 2030 feet above average terrain on Tucson Mountain – had concluded that a pressurized antenna solution was best. The Tucson Mountain area, bordering the west side of Tucson, is prone to dust storms that can sweep through at speeds of up to 90 miles per hour. An unprotected antenna simply could not stand up to the environment as well as a pressurized antenna.

Andrew offered a top-mounted TRASAR antenna with full radome enclosure and 60 kW power rating and a guaranteed delivery of just 16 weeks. The project team – working with KHRR's engineers – made such good time that the antenna was delivered two weeks ahead of schedule.

The TRASAR antenna uses computer-aided techniques to maximize the benefits of custom designs that are inherent in non-uniform arrays. Precise control of the position and electrical characteristics of each slot in the array provides the ability to shape the antenna beam. This type of control allows for the production of null-free elevation patterns with no real gain penalty. These techniques also improve product delivery by determining the precise dimensions and position of each slot prior to production and eliminating the "black magic" on the factory floor.

When KHRR's new TRASAR antenna was put into operation in late fall 2000, the station received calls from viewers saying how impressed they were with their improved picture.

Studio Specs
Design Team
Steve Twiselton, chief engineer
Arturo Rubio, engineer

Equipment List
Andrew TRASAR antenna ATE24H8-ETOXL-40H
ITS-20A exciter modulator
ITS Pulsar
Videotek DM-200 demodulators
Trinity system
Mosley MRC-2 transmitter remote control
Tektronix 492P spectrum analyzer
JVC monitors for master control
Sony DSR-1500 digital tape machine
Sony DSR-1800 DVcam recorder
QSI image insertEr

KHRR
KERA chose Andrew Corp. to help make their transition to DTV a success. The transition began with the station being assigned the lowest channel in UHF band, Channel 14. But when local licensees noticed that there was a problem of DTV interference with existing land mobile and other licenses in the spectrum below Channel 14, many petitioned for another channel. Unfortunately, there wasn’t another workable channel available in the Dallas, Texas area, so they knew they would have to work with what they had.

The KERA staff realized early on that there would be radiating energy at the lower edge of their DTV signal. The Channel 14 DTV signal has components from 470 to 476 MHz, which is quite different from an NTSC TV station operating at Channel 14. Many mobile operations in the Dallas metro area had valid licenses to operate their low-powered equipment in their businesses, so it was imperative that KERA operate their digital transmitter with the least amount of interference to those land mobile users operating just under 470 MHz. They began by conducting tests with a Dallas-based land mobile consultant to determine what level of attenuation would need to be achieved by a mask filter. The required attenuation was large. Furthermore, the filter characteristic would have to remain stable with temperature and power level variations. Due to the expansion of the cavities of most filters, the characteristic tends to drift down in frequency with increases in power. This type of drift would be intolerable in this situation. If the passband were to drift down, the attenuation at the critical land mobile frequencies would drop significantly due to the steep band edge. Temperature stability becomes even more important if a station is going to increase its DTV power in the future, which was the case at KERA.

The KERA team knew that such a filter would be larger and more expensive than a typical mask filter. They also knew, due to the large band edge attenuation required, that the filter would have a large inherent group delay variation which would be challenging for the transmitter manufacturer to correct for. When the filter attenuation near the band edge is increased, the passband group delay variation also increases. Axcera Corp., the transmitter manufacturer, in conjunction with Andrew Corp., performed tests to ensure that they would be able to provide the large amount of correction that would be required.

The temperature compensated, 12-Section Trinity mask filter that was commissioned from Andrew Corp.’s Passive Power Products division provided the desired attenuation and the temperature stability to do the job, and the Axcera transmitter correction scheme was able to deal with the large group delay variation.

KERA Channel 14 has been on the air with their new system since Dec. 14, 2000, at low initial power levels and will be implementing a planned power increase in the near future.

**KERA-DT**

**Design Team**

KERA-DT

Rick Owen, vice president of engineering and chief technology officer

Andrew Corporation

Spencer Smith, vice president of broadcast

Axcera Corporation

Dan Dickey, coordinating engineer

**Equipment List**

Trinity mask filter

Axcera Corporation solid state transmitter
Detroit Public Television’s
WTVS-DT

Detroit Public Television (WTVS) was leasing an analog transmitter facility and antenna space from WKBD (UPN), which is also home to WDWB (WB), when the station was informed that the tower would not support DTV antennas for all three stations. WTVS learned that WWJ-TV, the local CBS affiliate, was planning to build a new 1012-foot guyed tower nearby, so WTVS negotiated a deal to lease a DTV transmitter facility and antenna space from the WWJ-TV location.

The CBS building and tower was designed to accommodate several transmitters, both TV and FM, as well as wireless services. Because of the timeline for WWJ-TV’s move of both its analog and digital transmitters to the new facility, WTVS chose to accelerate its DTV plans so it could take advantage of the crews that already were scheduled to build the tower and install WWJ-TV’s antennas. In cooperation with CBS and assistance by local broadcast consultant John FX Browne & Associates, Dielectric built a stacked DTV antenna for WTVS (Channel 43) and WWJ-TV (Channel 44). While the tower was being constructed, WTVS applied for an NTIA/PTFP grant to purchase DTV master control, a DTV transmitter and STL equipment. The grant was awarded in September 1999, and the search for equipment manufacturers and vendors began.

In parallel with the tower and antenna construction were plans to divide the tenant space in CBS’ transmitter building. One of the innovations implemented was the sharing of CBS’ UPS/generator electrical system. The use of protected and regulated power from CBS reduced the need for an additional generator and UPS for WTVS’ transmitter. Also, the size of the transmitter room and the layout for the transmitter and RF equipment allows the station to add a second IOT for full redundancy.

As soon as the NTIA/PTFP grant was awarded, WTVS put out an RFP for the transmitter and studio equipment. After evaluating proposals from a number of very competitive transmitter and DTV equipment vendors, WTVS chose Axcera (then ADC) to build and install its DTV transmitter.

The project was completed under budget and met the goals and expectations of the WTVS crew. The Axcera transmitter has been extremely reliable and puts out an excellent signal. The WTVS design team believes it chose the best DTV transmitter manufacturer for their project.

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Excellence Awards

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Axcessing the new era of digital communications.
Beginning in late 1999, WABC (Channel 7 in New York City) began to prepare for the updating of TV8, the ABC O&O station's on-air master control room. The existing control room had been built in the early 1980s using entirely analog NTSC technology. Surrounding it was similarly dated infrastructure which, while of high quality, was becoming less supportable every year. The first step was to move TV8 to a temporary location, followed by a redesign of the space and re-equipping as needed.

The nation’s most important media market, and home to the ABC television network, would also be installing DTV systems at the same time. The decision was made to build one master control room for both the DTV channel and Channel 7 using Philips (now Thomson) Saturn master control switchers for both HDTV and SDTV.

The space plan for the control room, completed by consultants and designers at AZCAR, was intended to provide a comfortable working environment. The new infrastructure would be the core for the entire station in the future and it was decided that a Grass Valley Group SMS-7500 wideband routing switcher with SMS-7500NB AES routing would be used. In addition, the GVG control system would have to control an aging GVG 440 routing switcher and interface with the ABC network plant router.

Commercial playback in the system built by AZCAR is a pair of mirrored Pinnacle MediaStream 700s used for both program and commercial playback, and a third MediaStream 1600, which interfaces to a pair of AMPEX DST-712 digital archives under Avalon Archive Manager control. The MediaStreams are automated by Encoda MCAS automation software, as are the Sony Betacam SX VTRs and the master control switchers.

The system was designed and constructed by AZCAR offsite while the renovated control room designed by Carlton was being finished. After system tests, the racks and equipment were dismantled and shipped to New York where AZCAR completed the installation. The new system lays the groundwork for the complete conversion to digital technology over the next several years. AZCAR is completing TV-13, the news production control room now.

On the weekend of Sept. 8 of this year, the new systems went live for the first time. Two days later, WABC Channel 7 and WABC-DT went dark when the World Trade Center collapsed, killing ABC technician Don DiFranco.

**Studio Specs**

**Design Team**
Bill Beam, WABC director of engineering
Kurt Hansen, WABC chief engineer
Karl Paulsen, project manager and lead designer
Greg Abel, project engineer
Marty Skoff, installation manager

**Equipment List**
Thomson Saturn master control switchers
GVG SMS-7500 routing
Nvision 3064 RS-422 machine control port switch
Pinnacle MediaStream 1600/700 video servers
Amex DST-712 data archive
Avalon Archive Manager
Ikegami video monitors
Encoda MCAS automation

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Contest information on page 64
KALC remote broadcast vehicle

The KALC remote broadcast vehicle is a converted ambulance that, prior to being rebuilt, was unable to perform its tasks as a remote vehicle in the condition it was in. The audio equipment was either unusable or not operator-friendly and the telescoping mast was in need of overhaul and repair as well.

The design team was faced with having to tear out all the audio equipment and start from scratch, which turned out to be the best route. There were several main design innovations that were implemented in the facility.

The first innovation involved the actual routing of audio throughout the vehicle so that it wouldn't be seen, but was easily obtainable for repair or future upgrades. The advantage of working with an ambulance was that most of the interior carpentry frame was already there, although the design team had to redesign it to handle the needs of remote broadcasting. The process of creating wire channeling through the ambulance furniture solved the problem of hiding the audio routing, and rebuilding the interior with hinged compartments solved the engineering access problem.

The second innovation involved the physical placement of the audio and RF equipment. Keeping the RF and audio equipment in separate racks eliminated any RF leakage into the audio chain.

The third innovation involved "cleaning up" the existing power fluctuations in the power system. To do this, the team integrated two power conditioners into the design. The conditioners were a Furman PLPLUS enhanced power conditioner and an ETA PD11LV conditioned power distributor.

The fourth innovation involved an inoperable mast. The team subcontracted a local welding and fabrication company, Fascinating Fusion in Golden, CO, to remove and overhaul the Wi-Burt telescoping mast in order to eliminate the leakage problem it was having. Fascinating Fusion did a complete overhaul, cleaning and seal replacement of the mast.

The fifth innovation involved installing new weatherproof PA monitors on the roof.

The final innovation involved designing an I/O panel on the outside of the vehicle, making it possible to have capabilities outside the vehicle while being able to keep all the doors closed. To do this, they installed balanced audio and speaker cable connectors in a weatherproof box provided by Shook Mobile Electronics.
The Xact Internet facility is a new Internet audio production facility that houses four production studios, one of which is a multi-track recording studio with two adjoining voice booths. Xact Internet offers stations with a custom service offering listeners custom radio through their Web site under their brand and imaging. Stations featuring Xact's music application allows users to create their own stations using the existing station's playlist. Users download the application from the station's Web site and are able to modify the types and frequency of music heard. The application reacts to listeners' preferences, memorizing choices in artists, songs and genres, and anticipates future music that falls in line with those choices.

This is a network affiliate model, offered on a format exclusive to each market. The users delivered by hundreds of affiliates are then aggregated. National sales staff sells the simultaneous audio and banner inventory on the player, accessing Internet and interactive budgets not currently available to radio. Each affiliate receives a share of the revenue generated by their listeners. A few stations using Xact Internet include WBOS in Boston, WMMW in Philadelphia, WLUM in Milwaukee, WZPL in Indianapolis, and KBEE in Salt Lake City.

The design criteria of the facility involved building in a new location. The goals were to design and install studios in a refurbished warehouse located in the northeast part of Denver that would house four production studios, a server room and offices. There was also a push to design a facility that was very cost-effective, would easily integrate with the company's mass array of servers, and could handle 24-hour production with virtually little maintenance.

Creative Studio Solutions was chosen to design and install customized studios for Xact.

The production studios had to be totally isolated and floating because the facility is on the second floor of a three-floor renovated factory. The floors of the building are wood with no insulation between floors. The studios were designed to "float" on the original floor and ceiling (floor of the third floor).

The facility is analog and digital, enabling it to handle any type of format that the company might encounter.

**Studio Specs**

**Design Team**
Creative Studio Solutions

**Equipment List**
- Marantz PMD-502 cassette recorder
- Denon DN-680 CD players
- HHB CDR850 CDR recorder
- Mackie analog mixing consoles
- Tascam DA-45HR DAT recorder
- Symetrix 581E distribution amps
- Aphex 109 Tubessence tube equalizer
- Yamaha SPX990 EFX processor
- Tekis Zephyr digital network receiver
- Korg N1 keyboard
- Logitek Ultra VU level meter
- ElectroVoice RE20 microphone
- RDL ST-OSC2A oscillator
- Event PS5 active studio monitors
- A/VR TT audio patch cables
The new WPTV studio facility was built to replace an outdated, overcrowded facility that was located on the Intercoastal waterway in West Palm Beach. The new facility was to employ new technologies where appropriate, keeping Digital Television in mind. The facility was to have two studios, two studio control rooms, multiple news editing rooms, enhanced Studio Specs

**Design Team**

- Tom Norman, project engineer
- Belinda Binkley, project supervisor
- Craig Tabler, installation manager
- Brooke Baker, David Schreiber, Brad Smith, Don Jewell; integration team
- Joe Flickinger, Perrie Land, Dennis Bukvic; CAD design team
- Byrum Faust, Doug Morford; millwork team

**Equipment List**

- Harris Systems furniture and furniture design
- Harris equipment racks and rack design
- Harris automation
- Philips Venus and Cobra routing systems
- Philips Saturn Master Control
- QTV prompter system
- Euphonix and Mackie audio mixers
- Accom DVEous
- Pinnacle Lightning still stores
- Tally Display Corporation under-monitor displays and software

The new building was designed by Michael Brady Architects of Knoxville, TN. The design included two very ample studios, of which Studio A would be contiguous with the newsroom with the news sets built into the studio. The control rooms for the studios were to be as nearly identical as possible. Master Control would be automated to enable control of multiple outbound programs (both HD and SD). And ENG activities were to be significantly enhanced, with additional recording positions and additional remote management positions.

Project delays were unavoidable due to WPTV building construction, including WPTV having problems acquiring permits and juggling staff work schedules and activities that conflicted with the process of building the systems.

There were many innovations that were implemented in the new design. First, the facility operates with one outbound signal to the WPTV-TV transmitter and is pre-wired for four additional SD signal paths and one HD path. Second, the under-monitor display system is very large. Status changes to sources are tallied by means of GPI emulators from the DD-35 switchers and by means of GPs from Master Control. Third, the weather radar communicates with the studio by means of a T-1 circuit that piggybacks onto the station’s analog STL. Finally, the station has the largest Edistream installation in the United States. The system includes eight news editing rooms, four high-end editing rooms, four ingest stations, three publish gateways, massive on-line storage, and a tape archive for near-line storage.

The facility is readily upgradeable due to future-conscious design decisions and the ample space designed by the architect. The facility’s DTV/HD infrastructure is also already in place.

The key vendors included Harris and Philips. Harris provided the systems design and integration, furniture design and manufacture, and served as a source for most of the non-Philips equipment. Philips provided signal routing, master control, production switching, studio cameras, non-linear editing systems and Media Pool servers.

Vote now for your favorite installation. [www.broadcastengineering.com](http://www.broadcastengineering.com)
Canadian Satellite Communications

Canadian Satellite Communications Inc. (Cancom), a leading provider of satellite-based broadcast and communications services in Canada, is the first to take delivery of Evertz's newly introduced VistaLINK-enabled 7761AVM-DC dual-channel composite analog audio and video monitoring card. The 7761AVM-DC will be used in conjunction with Cancom's Broadcast Solutions and Star Choice monitoring operations.

Canadian Satellite Communications provides broadband cable television, Internet and satellite services to approximately 2.8 million customers. They chose the 7761AVM-DC because they needed a space- and cost-efficient solution. Since they already have an established SNMP Manager implementation, they also needed to have a solution that could be integrated and interoperable.

The 7761AVM-DC is Evertz's newest addition to the audio and video monitoring (AVM) product line for two independent composite analog video inputs. Similar to the 7760AVM, the 7761AVM-DC card performs a number of quality control and monitoring functions including audio level and phase bar graph creation, closed captioning, VITC, program rating, and SID data extraction and on-screen display. In addition, an extensive list of error conditions can be monitored with fault conditions configured and enabled to automatically alert operators.

VistaLINK is a product feature that enables remote monitoring, control and configuration of products via Simple Network Management Protocol (SNMP). It offers the flexibility to manage operations including signal monitoring and module configuration from SNMP-enabled control systems (Manager or NMS) locally or remotely.

Cancom is one of the largest satellite relay distribution undertakings in North America, delivering television signals to remote and rural markets via satellite, reaching 4.5 million homes through more than 2000 cable systems. Star Choice Communications, a wholly owned subsidiary of Cancom, is Canada's first direct-to-home (DTH) broadcast service provider and was ranked as the company's fastest growing technology company. Star Choice carries more than 300 audio and video channels nationally and is also the first Canadian broadcaster to distribute high-definition programming to subscribers. Both Cancom and Star Choice are divisions of Shaw Communications.

Shaw Communications has significant interests in telecommunications, Internet infrastructure and interactive television companies.

**Studio Specs**

**Equipment List**

Evertz 7761AVM-DC Dual Channel Composite Analog Audio and Video Monitoring card with VistaLINK

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Contest information on page 64
KCTS

KCTS is an existing PBS station in Seattle, WA, that used Harris Systems Integration to upgrade their existing single-channel Master Control from a vintage analog audio/video plant to Serial Digital Video, Digital AES Audio, High Definition Video, and four additional output channels. Harris’ upgrade provided the facility with a new Master Control room and a new server/archive room, and made additions to the existing technical core area and videotape area.

The master control room is home for a custom-built 12 bay horse shoe-style Harris console which houses the Philips Saturn master control switcher, Oxtel Presmaster master control switcher, Leitch 12x1 emergency switchers, Philips DVE, Chyron Duet character generator, Leader HD/SD waveform monitors, Tektronix AES/SDI waveform monitors, Philips routing switcher panels, and Harris Automation Air Client PCs. Also, HD and 31C switching was accomplished from this position with a Leitch 12x2HDAESC HD switcher and two Harris TRS-12 310m switchers. The Avitech virtual monitor wall system was used in conjunction with the Christie Cube monitors, giving KCTS the ability to size, shape and place up to 16 sources on each 50” screen. The Philips Saturn master control switcher ran the SD program channel along with the HD program channel.

All server-based equipment was set in 10 racks in the server room. The Sea Change Media Cluster five-mode server system is used for satellite network feed records, ingest of existing tape-based material, playback to air, and material prep/editing before air.

The heart of the technical core area, where the majority of equipment resides, is the Philips routing system, which consists of a 2001 Serial digital video frame. Additional routing capabilities include the Venus combined RS-422 and time code router frame. In the initial design and configuration of the routing system it was decided that it would become an all-digital plant so that all existing equipment (sat receivers, production switchers and videotape machines) would be A/D converted using Leitch/DPS 475 frame synchs selected to the Digiduplex mode. This frame sync would also be used for A/D and D/A conversion between existing analog routers and the new digital routers.

Additions to the videotape area included the addition of two media prep stations for tape ingest and review of recorder material. The equipment used to provide this function included Sony studio editing recorders, Ikegami 14” monitors and Harris Automation Media Client.
Across the country and around the world, the most trusted name in transmitters is Itelco. Whether you're replacing an existing analog plant, fulfilling the requirements of the DTV mandate—or both—you can count on Itelco's complete transmission solutions. Engineered excellence means reliable operation year after year. Stringent design specifications guarantee unrivaled on-air performance. Our unique Itelco Supervisory System provides single-point monitoring and control of multiple transmission sites. No wonder Itelco's been the choice for more than 14,000 installations since 1961.
WRAL, a pioneer in leading broadcast technologies, chose a Wheatstone TV-80 series audio console to produce the audio for its history-making high-definition newscasts. WRAL, the first station in the United States to broadcast an HDTV signal in 1996, is the world's first news operation to present HD local news on a continuous basis.

WRAL installed a customized Wheatstone TV-80 series audio console in their new high-definition control room as part of their daily HD news operation. The control room is located in their new 24,000-square-foot all-digital news studio.

WRAL's selection of Wheatstone's TV-80 series audio console illustrates the station's commitment to delivering the highest quality signal to viewers, which includes CD-quality sound. The TV-80 audio consoles are manufactured specifically to accommodate stations with a strong local news commitment as well as independent, syndicated and network affiliate programming.

TV-80 features include flexible mix-minus, source recall, all-LED illuminated switches, and a sturdy modular design. The TV-80 uses all-electronic switching, insuring the highest reliability and error-proof operation from a streamlined economical and ergonomic package. Other features include computer recall of pre-selected audio sources, alphanumeric source displays, a house router interface, an operator-intuitive eight mix-minus system and a master confidence IFB panel.

Mixing flexibility is ensured with full-function talkback to all submasters, auxiliary sends and mix-minus busses. Standard configurations include eight monaural submaster and two stereo master outputs—each with metered mono sum outputs, eight user-configurable auxiliary sends, four mute groups and direct outputs from every input. In addition, the TV-80 has Wheatstone's Event Computer System for computerized operations and recall of input preselector settings. In the TV-80, the Event Computer system has eight optional active input preselectors.

Wheatstone Corp. designs and manufactures professional broadcast audio equipment. The company also markets a digital audio network router and several lines of studio furniture, as well as a unique studio interface wiring system.

**Studio Specs**

**Design Team**
- Mike Jepcureh
- Fred Kelly
- Rodney Iwatin
- Craig Turner
- Trey Semmes

**Equipment List**
- Leitch AMD-8580 distribution amps
- Quested monitor speakers
- 2-Digicart II Plus digital audio recorder/players
- Sony PCM-R500 digital audio recorder
- Marantz FMX331 CD player
- B&B Systems, Inc. AM-38 Audio phase scope
- Grinn DI-22 telephone hybrid
- Lexicon 24-bit dual channel processor
- Aphex Compellor Model 320

**System**

- 18: ADC patch panels
Through a combination of good timing and good connections, TeleVest was able to convert an NBC facility in Brooklyn, NY, into JC Studios, which became the new shooting location for “As the World Turns.” Yet, the centuries-old facility brought its fair share of challenges. JC Studios inherited essentially empty and outdated studios and had to start rebuilding from scratch. NBC left behind two older SSL audio consoles in need of upgrading and an assortment of cabling and wiring. The engineering crew had no idea where anything went when they took ownership of the space in November 1999, and they had only two months to figure it out.

The studio needed major upgrading. They started by putting in all new cameras and tape machines, as well as microphones and mic booms. The SSL 6000 boards worked fine initially, but they were in need of upgrading, especially since JC Studios was building everything digitally and the analog consoles didn’t fit. The decision to go with the 32-channel Aysis Air systems was their first step in taking the entire production chain digital. The new audio boards were a good decision because the show is recorded AES/EBU and stays in that format until air. JC Studios has SSL Aysis Air mixers in the studios and a Zaxcom DMX1000 in the edit suite. While the video in the studio is still recorded in NTSC on Digital Betacam VTRs, they didn’t lose anything in post because of the serial-digital video editing done there on the GVG-2200 switcher.

One of the best things about the audio installation is the small number of patchbays needed to upgrade to the new system. The new digital system requires only two digital and two analog patchbays in each studio. The existing studio also had cabling left over from the 1950s – coax with cloth coverings that was obviously outdated. They replaced it with HD-ready cable because the plan is to take the show to high definition.

Another obstacle was trying to decide which HD format – 1080i or 720p – will emerge as the standard. The show doesn’t want to transition to high definition until there is a clear-cut winner, but JC Studios plans to upgrade when that is the case.

Both studios are now up and running with new digital equipment in place that can easily support the migration to high definition.

### Studio Specs

#### Design Team
Ron Berknopf, chief engineer
Paul Stiegelbauer, director of technical operations
Ed Dolan, senior audio engineer
Frank DiMauro, audio engineer

#### Equipment List
Thomson Digital Betacam VTRs
Ikegami studio cameras and handheld cameras
Ikegami color monitors
Canon lenses
Vinten Quattro studio pedestals
Vinten Vector pan heads
Grass Valley edit system

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Contest information on page 64
The Cheetah provides a comprehensive solution to today's multi-format digital switching requirements. Engineered for HDTV operation, the Cheetah can also handle SDI signals in the same frame. Each block of 16 inputs or 16 outputs can be either copper or fiber. Monitor grade video DAC outputs are available as an option, an industry first! An ethernet control interface is also provided.

- Four standard frame sizes, from 64x64 to 512x512
- SDI or Multi-Rate (3Mb/s to 1.5 Gb/s) cards with reclocking
- Mix copper or fiber inputs and outputs in the frame
- Single or dual outputs
- AC or -48DC power supplies
WCVB-TV had an aging fleet of ENG vans that needed to be replaced. The plan was to replace one ENG truck per year, and it was decided to include digital ENG capabilities along with the traditional analog FM technology.

The goals of the new digital ENG facilities were threefold: to investigate digital ENG using COFDM as a way to compensate for the reduced number of microwave channels available in the Boston market due to new users; to improve the station’s existing ENG coverage by eliminating dead zones caused by multipath; and to provide additional news gathering capability by adding the ability for feed tape or the ability to go live while in motion.

The design criteria was to build the first digital truck as a test bed and build the next ones with the lessons learned. Unlike typical ENG vehicles, these trucks have two transmission antennas and two modulation technologies. A 23 dB gain reflector design for fixed operation was implemented as well as a 5 dB omnidirectional antenna for stationary operation where overhead wires are too close and for live shots while in motion.

The transmitters are equipped with traditional analog FM modulators and digital modulators. The dual modulation capability provided by the CodeRunner equipment allowed a comfort zone for the news department and a diagnostic tool for engineering. The dual antennas provided additional operational flexibility and a safety margin for the crews.

Future use of this equipment for live HD is possible by upgrading the MPEG encoders and decoder. The receivers and transmitters, due to their linearity and phase stability, are able to use higher-density modulation forms and, therefore, would remain unchanged.

With the final implementation, WCVB now has a state-of-the-art fleet consisting of three third-generation digital ENG vans and an SUV equipped with editing, three onboard lipstick cameras and digital tape editing.

The key vendors were Microwave Radio Communications (MRC) and Wolf Coach.
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- Intuitive Web-based system manager and configuration tool runs on any standard Web browser

- Industry standard control protocols support a choice of applications for transmission, collaborative production, media and asset management
- Extended File System allows simultaneous access to all content on all channels

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WFLA

The conditions of WFLA's old building, the issues of switching from analog to digital transmission, and having all three of Media General's media outlets in one location led the company to move the station into a new facility. The goals of the facility were to house three media outlets that could share a common facility and resources while maintaining their editorial independence. They also wanted to convert WFLA from analog to being a fully digital station.

Media General relocated WFLA and Tampa Bay Online (TBO) next to the existing Tampa Tribune building. The main goals were to have a building that could easily be reconfigured to accommodate changing technologies. Technical cores and rack rooms were located next to storage spaces and other functional areas that could be potentially relocated.

The difficulty was to determine how all three media outlets could benefit from the use of shared personnel, news-gathering resources, data transmission and archives. Additionally, the new facility needed to be redesigned for future growth and expansion. As for equipping the facility, Professional Communications Systems had to assess the station's equipment needs and how the new equipment would function with existing equipment. PCS had to determine what could and could not be updated or integrated into the new station.

The key vendors were Grass Valley, Panasonic and Florical. Overall, the system control was complimented by Florical Automation's Airboss and ShowTimer platforms. The primary servers were Pinnacle MediaStream, Pluto Airspace and HD servers.

Overall, the new facility was a success. Each of the media outlets operate separately, yet are able to share resources. WFLA is a fully digital station and, as a result, now has an array of multiprogramming options as well as being able to offer the largest and most fully equipped digital stages in the market. Additionally, the flexibility of the new studios maximizes opportunities to produce a variety of less costly programming to its sister stations.
Radamec Broadcast Systems has installed one of the world's largest robotic control camera systems at NY1. The system, capable of robotically controlling any one of up to 21 cameras from any of four Touch Screen Panels, is being installed in NY1's new facility located in Chelsea Market on Manhattan's West Side. The new studios are scheduled to launch January 2002. NY1 is Time Warner Cable's 24-hour New York City news channel.

NY1 selected Radamec's system to achieve the smooth broadcast-quality, on-air movements essential in a news environment. NY1 chose to mount Radamec's 435S pan/tilt heads on their new uniPED robotic pedestals. uniPED is a new, low-cost mobile robotic height unit that is fully controllable and adjustable from Radamec control systems and enables an extra dimension of remote control. The 435S is designed to support cameras, lenses and teleprompters up to 110 pounds, and the electromechanical design ensures responsible control, precise repeatability and smooth broadcast quality movement.

One compact Radamec HK 431 pan/tilt head will be mounted above the newsroom to achieve wide shots. The 431 supports camera and lens packages up to 33 pounds and incorporates agile performance with precise repeatability for slow, smooth on-air movements.

NY1 will also install Radamec's new Weather-Cam, an innovative robotic pan and tilt head designed to endure severe weather conditions. The 433 Weather-Cam, to be located on the roof of the building, provides a reliable and cost-effective solution for achieving broadcast quality coverage of outdoor events. The Weather-Cam can be controlled from any of the four Radamec Touch Screen Panels.

Four identical Touch Screen Panels (TCP), Radamec's most advanced and powerful controller, will be installed to achieve a high level of redundancy. Depending on the user configuration, any TCP will be capable of operating any camera from any position at any time. The TCPs provide clear, distinctive visual displays with easy to operate interactive touch screens. Video is grabbed and stored on the touch screen, which is divided into twelve positions per 'page'. Shots are labeled and recalled by the operator's simple touch to the desired image.

### Studio Specs

#### Design Team

**NY1**
- Jeff Polikoff, director of engineering
- A.F. Associates Inc., systems integrator
- Radamec
- Bret Lukezic, U.S. vice president and general manager
- Brahms Lee, U.S. technical manager
- Alistar Watt, software designer
- Harvey Thompson, hardware designer

#### Equipment List

- uniPED robotic pedestals
- 435S pan/tilt heads
- HK 431 pan/tilt head
- HK 433 Broadcast WeatherCam
- Touch screen panels
- Central computer

NY1 News - robotic camera system
Seattle-based Webcasting service provider Activate recognized the growing demand for Internet broadcasting in early 2000, and decided to expand their current facility. In February 2001, Activate premiered Activate Grand Central, which is the industry's largest digital operations center. The center is located in the historic 1914 Black Manufacturing Building and represents a $20 million investment in software, hardware, networking and broadcast technologies.

Activate felt that the facility of a successful streaming media provider needed to incorporate resources that would enable it to provide application services, signal capture, production and distribution of content ranging in form from compressed MPEG to native resolution HDTV. Activate Grand Central incorporates processes in the broadcast systems infrastructure much like those used in network systems infrastructure.

The central design philosophy for the expansion was to be future-proof, capable of staying current with all of the evolving rich media formats, and compression/encoding/streaming technologies. An integral part of the design philosophy was efficient capital expenditure, format flexibility, Gigabit Ethernet Network structure, advanced control/monitoring and historic landmark preservation. Activate contracted Doyle Technology Consultants, Inc. to assist in managing all of these requirements together.

The audio/video infrastructure was built around a 512x512 Nvision Envoy 6904 super-wide-bandwidth digital video routing matrix. The facility utilizes an Nvision Envoy 7256 AES routing matrix incorporating time division multiplexing (TDM) technology for more flexible digital audio routing. Activate's existing PESA Jaguar analog router was repurposed for additional flexible signal-quality monitoring of incoming analog feeds such as satellite, Vyvx and off-air. All encoding and tape-capture workstations have 32-button router panels and all QA and monitoring workstations use full X-Y matrix router controls. ADC products were selected for distribution, patching and wiring infrastructure components and connectors. Belden Plenum-grade digital coaxial cable and CAT-6 compliant Mediatwist provided 1.8 million feet of copper interconnection. Panduit CAT-6 connectors and patchfields were used exclusively throughout the LAN and WAN networks.

Network management is achieved through Activate's proprietary software tools and a routing matrix. This system allows Activate to manage several hundred encode platforms from just a few user stations.

Satellite acquisition is provided for with the multiple DH Industries 3.7M C/KuBand TVRO antennas, DTH, and 2.7M antennas.

The state-of-the-art Activate Grand Central houses the only fully wideband digital audio/video router and provides the most signal ingress capacity in the streaming media industry.

### Studio Specs

**Design Team**

**Activate**
- Scot Whitcomb, director of broadcast engineering
- Kerik Edwards, director of broadcast operations
- Mitch Stewart, manager of technical operations
- Missa DeLaurentis, facilities manager
- Doyle Technology Consultants
  - Greg Doyle, president
  - Barry Ballanger, director of engineering
  - Alan Cunningham, director of field operations
- Tory Tarango, project integration manager
- Carroll Construction
  - Kelly Carroll, construction general contractor
- SPACE Architectural
  - Dave Helton
WGCL-TV in Atlanta, GA, delivers its news and CBS program lineup from a brand-new building with a digital infrastructure designed by Digital System Technology (DST) to handle the changes and challenges the broadcasting industry faces.

The new 53,000-square-foot facility is built around a 270 Mbits/s serial digital routing and distribution infrastructure. The routing frame and the cabling and patching will enable support of high-definition signals at 1.5 Gbits/s in the future. The station was known as WGNX until July 2000, when it changed its call letters to WGCL to reflect the station’s “clear” news image.

DST was selected to consult, manage, design and install the technical facility in cooperation with WGCL’s engineering staff. The Austin Company was chosen to design and construct the building. The team built two studios, a combination master control/news support area, central equipment room, newsroom, two production control rooms, a technical shop, multiple news edit rooms, graphic suites, production rooms and satellite earth stations.

WGCL decided on a serial digital video infrastructure, but opted for analog audio for ease of use and economy. The wideband Grass Valley Group 7500 video router was wired for 256x256, and high-definition boards can be installed when the demand arises. Analog video and audio 64x64 frames were also installed to operate under a common control system.

Cable management is always a challenge, but the 1.5 Gbits/s requirement for video coax (Belden 1694) meant special handling throughout the installation process. Careful attention to rack layouts and equipment layouts in the racks allowed power conduit and broadcast system cabling to follow separate routes.

WGCL should be future-proofed for the challenges to come in a top-ten market.
Crawford Communications' satellite services facility

Crawford Communications chose Sundance Digital to install two large-scale, multi-channel FastBreak Automation Version 2.0 systems in Crawford Satellite Services, the corporation's service area. The systems furnish a fully mirrored automation solution for a 16-channel operation, as well as a four-channel operation. Sundance Digital FastBreak Automation V.2.0 to integrate the entire broadcast process, including near-line archive through on-air playback. The systems will control an array of Pinnacle MediaStream servers and an ASACA DVD library through SGL archive management software. FastBreak Automation V.2.0, the latest generation of Sundance Digital's FastBreak Product range was officially launched at NAB 2001. Based upon the architecture of Sundance Digital's successful FastBreak Automation, the new version incorporates many upgraded features, including support for Microsoft's Windows 2000 operating system and SQL Server 2000.

FastBreak Automation offers robust, scaleable and frame-accurate control of the video server and other station peripherals in either single or multi-channel configurations. Elements may be operator or time-of-day triggered and each may include an unlimited number of secondary events. Optional additions include ListSync for total playlist redundancy, Launch Box, a direct access control panel, and the Sundance Archive Manager.

Crawford Communications continues to be a leader in the electronic media services industry with innovative talent and technology in a fully integrated facility. The privately owned company provides services for domestic and international clients involved in all facets of television, film, audio, Internet and satellite communications. Crawford Communications has evolved with technology to comprise the best in television network origination and playback, satellite transmission, streaming media/Webcasting, online services, transportable satellite truck services and post-production services.

Sundance Digital is a leading provider of cost-effective, high-performance broadcast automation solutions. Sundance products are in use in broadcast facilities worldwide.

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Contest information on page 64
The primary goals and drivers behind KGO’s digital production system renovation centered on enhancing KGO’s market competitiveness, improving on-air branding, refining overall technical picture quality, enhancing working environment ergonomics and adjacencies, and increasing operational efficiency.

After upgrading its newsroom computer systems to support digital news development, KGO decided to better align its news production and development operations. In addition, KGO wanted to provide for an improved working environment with emphasis on meeting its primary goals.

Fundamental design and project criteria were predicated on renovating KGO’s main production control environment to leverage the quality, capabilities and dynamic flexibility of an all-digital production environment. In addition, the goals of the new design were to enhance existing system functionality, redefine workflow and support prospective future technologies. These fundamental design criteria had to be implemented within KGO’s budget and operational constraints.

To ensure success, SignaSys employed a multi-phase project approach and addressed KGO’s operational considerations such as ratings periods and existing system utilization time frames. Since KGO is a 24/7 operation, special emphasis was placed on system transitional planning and coordinated implementation scheduling. In addition, integrated multi-image display monitoring was implemented at KGO, which allowed for dynamic reconfiguration of supporting monitor walls. Finally, the audio layer of the KGO system was predicated on AES/EBU digital audio.

KGO specifically selected SignaSys to provide for overall project management, design and installation services. Specifically, SignaSys addressed issues from project analysis and planning to full design and installation. This included overall project budgeting, scheduling and transitional planning, as well as engineering services from conceptual to final systems design, facility requirements, and full system installation and testing.

The KGO production system was founded on an all-digital production environment. The video core is supported by a 4ME Grass Valley Kalypso digital video production system and a four-channel GVeous DVE. Production audio was established on an AES/EBU digital audio format. To support the mixing requirements, a 48-channel Aysis Air digital audio mixing system was selected. This mixing system was primarily chosen due to its overall quality, flexibility and optimal user interface.

Feedback from KGO operations has been extremely positive and the primary design goals have been met or were exceeded.
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The goal of KWHY's new service was to provide an initial platform upon which to build a digital station. The competitive environment of the No. 2 DMA indicated that the station provide a digital service sooner rather than later. The goal was to build the required digital transmission facility and plant a digital "seed" at the studio, which was designed to grow into a full digital plant. Equipment was purchased in 1999 and 2000 and was fully implemented by 2001.

KWHY was restricted to building out its new service within its limited space. The engineering and planning process, which was assisted by Thales Broadcast & Multimedia (formerly Thomcast), made maximum use of the little space available - both at the transmitter site and at the studio. At the transmitter site, improvements to tower strength (for the new antennas) and small structural changes were made in the building to provide the room. Making modifications to the studio was more difficult. Ultimately, KWHY built a "VCMR" (Very Cold Machine Room) in the unused space under the reinforced legs of the STL tower. Although the space was small, it provided enough space for 13 new racks.

There were many difficulties in designing and implementing digital in 1999. The entire operation of the station had to be considered, and choices had to be made as to how deep KWHY wanted to get into station operations with the initial implementation of digital.

To help with the selection of equipment and systems engineering, KWHY selected Thales Broadcast & Multimedia. The Thales DCX transmitters were picked as the RF choice due to crew field experience with the unit and for the excellent design engineering in its modulators. KWHY was equally impressed with the end-to-end multimedia solutions offered by Thales, such as the THESYS, Pearl PSIP Manager and the Opal MPEG Gateway. Together, KWHY and Thales laid out a system for the transmitter and for the studio. The studio installation added integration equipment of an Nvision 128x128 router, a MediaStream video platform and a two-channel MCAS III automation system. Equipment decisions were based on both live performance and on proven compatibilities with the station's system choices.

### Studio Specs

**Design Team**
- Thales Broadcast & Multimedia (former CDS division of Thomcast)
- Chesystems
- Blue Sky Engineering
- DES Transmitter Installation

**Equipment List**
- Thales DCX transmitters
- Thales Pearl, Opal and OpenMex software
- STL package
- Thales Master Control software and equipment
- Thales monitoring package
- MRC Twistream STL radios
- Moseley MRC2, 1620
- Harmonic encoders and THESYS control system
- Zenith demodulators
- Textronix modulation measurement set
- MCAS III automation
- N-Vision Envoy 6128 router
- Media Stream video server
- Leitch upconverter
- Aja A/D converter
the systems group your audience is waiting.

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<td>Fax: 847-671-9469</td>
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<td>100 - 6th Ave. 5th Floor</td>
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<tr>
<td>New York, NY 10013</td>
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<td>212-965-1400; 888-888-6383</td>
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<td>Fax: 212-965-3739</td>
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<td><a href="mailto:enquiry@ams-neve.com">enquiry@ams-neve.com</a></td>
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<td><a href="http://www.ams-neve.com">www.ams-neve.com</a></td>
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<td>75 Maiden Lane Ste. 907</td>
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<td>New York, NY 10038-4810</td>
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<td>212-269-1902</td>
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<td>Fax: 212-269-1943</td>
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<tr>
<td><a href="mailto:salesusa@analogway.com">salesusa@analogway.com</a></td>
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<td><a href="http://www.analogway.com">www.analogway.com</a></td>
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<td>Andrew Corp.</td>
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<tr>
<td>10500 W. 153rd St.</td>
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<tr>
<td>Orland Park, IL 60462</td>
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<td>708-349-3300; 800-DIAL-4-RF</td>
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<tr>
<td>Fax: 708-349-5444</td>
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<tr>
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<td><a href="http://www.andrew.com">www.andrew.com</a></td>
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<td>Angenieux</td>
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<td>40 G Commerce Way</td>
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<tr>
<td>Torowa, NJ 07511</td>
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<tr>
<td>973-812-3858</td>
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<tr>
<td><a href="mailto:angenieux@tetus.com">angenieux@tetus.com</a></td>
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<td>Antenna ID Products</td>
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<td>22 Bryan Wynd</td>
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<tr>
<td>Glenmoore, PA 19343</td>
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<td>610-458-8418</td>
</tr>
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<td>Fax: 610-458-8418</td>
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<tr>
<td><a href="mailto:antennaid@aol.com">antennaid@aol.com</a></td>
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<td>Shelton, CT 06484</td>
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<td>Fax: 203-925-9935</td>
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<td>Sun Valley, CA 91352</td>
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<td>818-767-2929</td>
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<td>Fax: 818-767-2641</td>
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<td>Applied Digital</td>
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<td>352-338-0516</td>
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<td>Fax: 352-338-1108</td>
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<td><a href="mailto:sales@applied-digital.com">sales@applied-digital.com</a></td>
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<td>Applied Magic</td>
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<td>5845 Owens Ave.</td>
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<td>Carlsbad, CA 92009</td>
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<td>760-931-6417; 888-635-4255</td>
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<td>Fax: 760-931-6440</td>
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Fax: 512-835-0434
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<td>Harmonic</td>
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<tr>
<td>Heartland Video Systems</td>
<td>1442 Pilgram Rd. Plymouth, WI 53073 920-893-4204; 800-332-7088 Fax: 920-893-3106 <a href="mailto:ngossens@hvs-inc.com">ngossens@hvs-inc.com</a> <a href="http://www.hvs-inc.com">www.hvs-inc.com</a>; <a href="http://www.hvs-dtv.com">www.hvs-dtv.com</a></td>
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<tr>
<td>Hi-Tech Enterprises</td>
<td>10707-66th St N. Ste F Pinellas Park, FL 33782 727-546-6407; 888-324-2509 Fax: 727-544-1018 <a href="mailto:the@videoequipment.com">the@videoequipment.com</a> <a href="http://www.videoequipment.com">www.videoequipment.com</a></td>
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<td>Hitachi Dentshi America Ltd.</td>
<td>150 Crossways Park Dr. Woodbury, NY 11797 516-921-7200 Fax: 516-496-3718 <a href="http://www.hdai.com">www.hdai.com</a></td>
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<td>Holaday Industries</td>
<td>14825 Martin Dr. Eden Prairie, MN 53344 952-934-4920; 877-HOLADAY Fax: 952-934-3604 <a href="mailto:info@holadayinc.com">info@holadayinc.com</a> <a href="http://www.holadayinc.com">www.holadayinc.com</a></td>
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<td>Hoodman Corp.</td>
<td>612 Meyer Ln. #10 Hermosa Beach, CA 90258 310-379-6391; 800-818-3946 Fax: 310-372-6420 <a href="http://www.hoodmanusa.com">www.hoodmanusa.com</a></td>
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<td>Horita Co.</td>
<td>PO Box 3993 Mission Viejo, CA 92690 949-489-0240 Fax: 949-489-0242 <a href="mailto:horita@horita.com">horita@horita.com</a> <a href="http://www.horita.com">www.horita.com</a></td>
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<td>Hotronic</td>
<td>1875 S. Winchester Blvd. Campbell, CA 95008 408-378-3883 Fax: 408-378-3888 <a href="mailto:sales@hotronics.com">sales@hotronics.com</a> <a href="http://www.hotronics.com">www.hotronics.com</a></td>
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<td>Horita Video</td>
<td>1442 Pilgram Rd. Plymouth, WI 53073 920-893-4204; 800-332-7088 Fax: 920-893-3106 <a href="mailto:ngossens@hvs-inc.com">ngossens@hvs-inc.com</a> <a href="http://www.hvs-inc.com">www.hvs-inc.com</a>; <a href="http://www.hvs-dtv.com">www.hvs-dtv.com</a></td>
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<td>I-BUS/Phoenix</td>
<td>888 Balboa Ave. San Diego, CA 92123 858-503-3000; 888-307-7892 Fax: 858-503-3005 <a href="mailto:info@ibus.com">info@ibus.com</a> <a href="http://www.ibus.com">www.ibus.com</a></td>
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<td>IDX System Technology</td>
<td>22809 Lockness Ave. Torrance, CA 90501 310-891-2800 Fax: 310-891-3600 <a href="mailto:soo.kim@idx.tv">soo.kim@idx.tv</a> <a href="http://www.idxtek.com">www.idxtek.com</a></td>
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<td>Itekco Technology</td>
<td>888 Balboa Ave. San Diego, CA 92123 858-503-3000; 888-307-7892 Fax: 858-503-3005 <a href="mailto:info@ibus.com">info@ibus.com</a> <a href="http://www.ibus.com">www.ibus.com</a></td>
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<td>Ikegami Electronics</td>
<td>37 Brook Ave. Maywood, NJ 07607 201-368-9171 Fax: 201-569-1626 <a href="mailto:bestony@ikegami.com">bestony@ikegami.com</a> <a href="http://www.ikegami.com">www.ikegami.com</a></td>
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<td>Image Video</td>
<td>1620 Midland Ave. Toronto, ON M1P 3C2, Canada 416-750-8872 Fax: 416-750-8015 <a href="mailto:info@imagevideo.com">info@imagevideo.com</a> <a href="http://www.imagevideo.com">www.imagevideo.com</a></td>
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<td>Imagine Products</td>
<td>12220 N. Meridian St. #130 Carmel, IN 46032-6936 317-843-0706 Fax: 317-843-0807 <a href="mailto:imagine@imagineproducts.com">imagine@imagineproducts.com</a> <a href="http://www.imagineproducts.com">www.imagineproducts.com</a></td>
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<tr>
<td>Incite Multimedia Corp.</td>
<td>4 chemin du Tir-au-Canon 1227 Carouge Geneva, Switzerland +41 22 308 57 57; 800-641-7322 Fax: +41 22 308 57 58 <a href="mailto:info@inciteonline.com">info@inciteonline.com</a> <a href="http://www.inciteonline.com">www.inciteonline.com</a></td>
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<td>Inscriber Technology</td>
<td>26 Peppler St. Waterloo, ON N2J 3C4, Canada 519-570-9111; 800-363-3400 Fax: 519-570-9140 <a href="mailto:info@inscriber.com">info@inscriber.com</a> <a href="http://www.inscriber.com">www.inscriber.com</a></td>
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<td>Intevideo</td>
<td>56 W. Broad St. Stamford, CT 06902 203-348-9229 Fax: 203-348-9266 <a href="http://www.intelvideo.com">www.intelvideo.com</a></td>
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<tr>
<td>International Fiber Systems</td>
<td>16 Commerce Rd. Newton, CT 06470 203-426-1180; 800-824-5990 Fax: 203-426-3326 <a href="mailto:sales@ifs.com">sales@ifs.com</a> <a href="http://www.ifs.com">www.ifs.com</a></td>
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<tr>
<td>Company</td>
<td>Address</td>
<td>Phone</td>
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</table>
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San Jose, CA 95110  
408-573-1400; 800-646-4434  
Fax: 408-573-1430  
info@interra.tv  
www.interra.tv |  |  |  |  |
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www.leightronix.com |  |  |  |  |
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Fax: 858-450-0155
info@opticomm.com
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Fax: 631-845-5023
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110 Knowles Dr.
Los Gatos, CA 95032
408-871-1975
Fax: 408-871-1976
pixelinstruments@msn.com
www.pixelinstruments.com
**Manufacturers/Dealers**

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Address details</th>
<th>Contact details</th>
<th>Website</th>
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<tbody>
<tr>
<td>Pixel Power Inc.</td>
<td>1700 N. Dixie Hwy. Ste. 150 Boca Raton, FL 33432</td>
<td>561-395-4801 <a href="mailto:jgilbert@pixelpower.com">jgilbert@pixelpower.com</a></td>
<td><a href="http://www.pixelpower.com">www.pixelpower.com</a></td>
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- Automatic repeat of either the NTSC or PAL color systems. Built-in Character generator can display VTR status, time code, self-diagnostic messages, setup-entries, etc. Normal (or LTC time code) pot (user RMT). The DSR-1000 also provides LG and E1 Free Run-Mode.
- Controls of your shutter, playback, pause, fast FF andREW with the optional SWM-10D Remote Control Unit. Composite and S-video as well as component video (SMPTE) which are switchable to RGB output. The UDW-1000A has an S-video and composite connectors equipped with Y/C switches. Green Bar-Biased in-dig TBC function and four motors.

DSR-1600/1800
DVCA M Studio Editing Player/Player Recorder

The DSR-1600/1800 is a studio editing player. The DSR-1600/1800 is a studio editing player. Both incorporate innovative technology at an affordable price. Excellent playback of all DV based (25 Mbps) recording applications. RGB signals can be converted into component signals and vice versa with minimum picture degradation. A composite digital interface allows external computer control of all VTR functions based on time code information. Standard RS-422 interface from between 38.4 kbps to 1 Mbits/s. Built-in Time Base Stabilizer (TBS) locks sync and sustains the precision within 30 mV. High quality digital drop-in-compensation for long hours of confident editing and performance. Equipped with two high-quality audio channels:
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UWV-1200/UDV-1400A
Betacam SP Player + Player Recorder

The UWV-1200 and UDV-1400A are non-editing VTRs which deliver Betacam SP quality and offer features for a wide range of playback and recording applications. RGB and RS-232 interface mean truly ideal for large screen. High quality video presentation, sync, and RS-232 interface means all are compatible with both NTSC and PAL color systems.

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Betacam SP Editing Player + Betacam SP Editing Recorder

The UWV-1600 and UDV-1800 are the other half of the UVW series. They offer the superior quality of Betacam SP with digital post options. They feature an RS-422 2-pin interface, built-in TBCs and Time Code operation. Input/output capability includes component, composite and S-Video. All the features of the UVW-1200/1400A PLUS-

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<td>Lemo USA Inc.</td>
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