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VOLUME 23, NO. 8 • APRIL 18, 2005

WHAT'S INSIDE

NEWS

Special Report:
PBS ACE
• pages 20-22



PBS

FEATURES

The Masked Engineer
• page 34



EQUIPMENT
REVIEWS

The new Sony HDV
Camcorder
• page 40



The Torch Is Passed Martin becomes FCC chairman

by Deborah D. McAdams

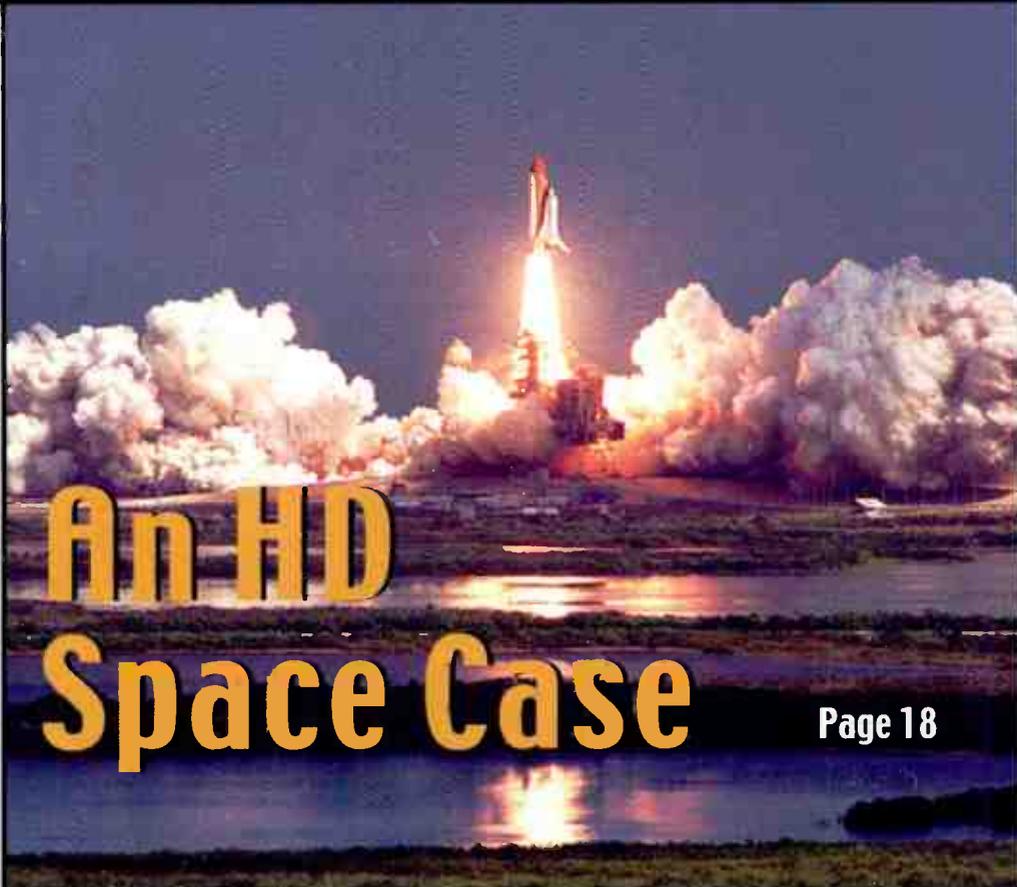
WASHINGTON

The FCC's lone voting proponent of multicast multicast must-carry took the helm of the commission in March. Kevin Martin, considered by many insiders to be too unpredictable to be a serious contender for the chairmanship, walked away with it when President Bush tapped him for the spot. As a currently sitting commissioner, Martin was not subject to a Senate confirmation.



FCC Chairman
Kevin Martin

TORCH, PAGE 14



Page 18

Avid Scoops Up Pinnacle

Pinnacle's consumer division to form basis for new branch

by Susan Ashworth

TEWKSBURY, MASS.

Avid took a larger stake of the video editing and broadcast market when it announced in late March that it would acquire Pinnacle Systems for \$462 million in cash and stock.

One big draw for the Tewksbury company? Pinnacle's healthy consumer video business, which has shipped more than 10 million units of products to users since its inception and posted revenues of \$334.8 million for the year ending June 30, 2004.

While Avid has found success in the high-end professional video industry—with 2004 revenue of \$589 million, making last year a record year for both revenues and profits—the company has not had comparable success in creating products for those at the entry-end of the video editing spectrum.

In response, Avid said it hopes to use Pinnacle's consumer video business as the basis for a new consumer video division at Avid, giving the company immediate access to the entry-level video editing market.

"Avid was pushed out of the [consumer] business [years ago] by Apple and to some degree by Pinnacle, who was a fierce competi-

tor," said Neal Weinstock, founder of Weinstock Media Analysis, a New York-based consulting firm focused on the professional video industry. "This [acquisition] gives them the opportunity to enter the consumer market again.

"But Avid needs to carefully decide how to best integrate Pinnacle, and it's going to be tough," he said. "[The consumer market] is a risky area."

NEXT GENERATION

Avid believes that by acquiring Pinnacle and its consumer video business, it will be able to tap into the next generation of video editors, creating "a very large potential cus-

AVID, PAGE 19

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IN THIS ISSUE

NEWS

- 1 The Torch is Passed**
Martin becomes FCC chairman
- 1 Avid Acquires Pinnacle**
Pinnacle's consumer division to form basis for new branch
- 6 Making the Rounds with NASCAR**
Fox Sports pushes the envelope on live racing
- 10 Transmitters Energized by Power, Control**
High power, greater efficiency and easier control are the new fundamentals
- 12 DTV Rides the Rails**
Atlanta first in the U.S. to deliver broadcast content to subway
- 16 Making the Past Last**
KET digitizes its history
- 18 HD Gives NASA a New View**
Agency invests in new video gear for the return to space
- 19 Comcast Moves to Protect, Expand Content**
Motorola, TiVo deals extend cable operator's reach
- 58 TV Technology Business**
EchoStar revenues rise; Dielectric appoints new president

Special Report: PBS ACE

- 20 Digital Journal—Anticipating ACE**
Working out the bugs in the first installation of the PBS automation system
- 20 The ACE Design**
Count on IT, *André Mendes*

FEATURES

- 24 In Praise of Unsung Editors**
Focus on Editing, *Jay Ankeney*
- 26 Compression and Cross-Modulation**
Digital TV, *Charles W. Rhodes*
- 31 Resolving Pin-1 Problems**
Audio by Design, *Mary C. Gruszka*
- 34 High Definition Has Its Place—In Cameras**
The Masked Engineer, *Mario Orazio*
- 36 Developing a Tapeless Workflow**
Production Manager, *Craig Johnston*
- 38 Grand Compromise Could Resolve DTV Transition**
The Big Picture, *Frank Beacham*

EQUIPMENT REVIEWS

- 40 Sony HDR-FX1 HDV Camcorder**
Stephen Murphy
- 44 Cartoni Tripod and Focus Pan/Tilt Head**
Bob Kovacs
- 46 Manfrotto Tripod and Pan/Tilt Head**
Stephen Murphy
- 47 Vinten Fibertec Tripod**
Carl Mrozek
- 49 Frezzi Stable-Cam**
Carl Mrozek

EQUIPMENT

- 42, 43, 48** Product Showcase
- 52-56** Classifieds

P.12 DTV Gets Onboard



CONTRIBUTING WRITERS

NAME:
Charles W. Rhodes



COLUMN:
Digital TV

This column has been dealing with DTV-DTV interference and has almost completed this discussion. Readers know, and I hope understand, that most DTV-DTV interference (the exceptions being co-channel and image frequency interference) is due to third order... p. 26

NAME:
Mary C. Gruszka



COLUMN:
Audio By Design

In my last column, I described how to test for pin-1 problems using a test device dubbed "The Hummer," which injects a 60 Hz signal into the ground system of a device under test. An output is monitored and any increase in the noise level with the Hummer signal applied... p. 31

NAME:
Craig Johnston



COLUMN:
Production Manager

I recently talked with a number of stations that are transitioning to tapeless video acquisition in their news departments. The removable hard drive, optical disc and memory card technologies these stations are moving to are very different. In each case the change... p. 36

P.6
Fox Sports does NASCAR



P.24
A toast—to unsung editors



P.40
Reviewing the latest in camera support gear



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TV Technology (ISSN: 0887-1701) is published semi-monthly by IMAS Publishing (USA) Inc., 5827 Columbia Pike, Third Floor, Falls Church VA 22041. Phone: 703-998-7600. FAX: 703-998-2966. The international edition is published monthly along with the month's second domestic edition. Periodicals postage paid at Falls Church VA 22046 and additional mailing offices. POSTMASTER: Send address changes to TV Technology, P.O. Box 1214, Falls Church VA 22041. Copyright 2005 by IMAS Publishing (USA) Inc. All rights reserved. For reprints contact the author and TV Technology.

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FROM THE EDITOR

Transitions

Although it seems like the DTV transition has been going on forever, this issue notes a number of transitions elsewhere that illustrate how quickly things are changing.

Start with the appointment of Kevin Martin as the new FCC commissioner. It's no secret that his predecessor's term was stormy, to say the least. But will Martin's be any less so? Probably not; in fact, it could be even more so.

Take the indecency issue, for example. Martin's past history seems to indicate that he will continue—and could possibly even escalate—the debate over broadcast indecency. But it's important to remember that Martin is one of five commissioners and that the courts will have the final say. With Congress threatening to expand its indecency rules to cable and satellite, let's hope that Martin's affinity for technology will prompt him to propose technical, rather than legislative solutions to the indecency issue, especially when it comes to pay TV.

Martin also will preside over what used to be envisioned as the deadline for the end of the DTV transition next year.

Although Congress is threatening to hold broadcasters to the 2006 deadline for the end of analog broadcasting, it will be Martin who will have to negotiate this landmine and balance the interests of consumers with those clamoring to get their hands on all that spectrum.

In this issue, we also report on Avid's acquisition of Pinnacle Systems, one of the largest mergers in our industry in recent years. Avid's justification that it was purchasing Pinnacle for its consumer product line spoke volumes about Pinnacle's efforts to penetrate the professional broadcast business. Although Pinnacle has some strong professional products with its Liquid line of editors, the company faced competitive pressures that led to persistent rumors over the past several years that it was on the block. Now Avid faces the challenge of incorporating a number of similar professional product lines into its own, while facing a new challenge of how to increase its presence in the consumer market. This is a transition that we will watch closely.

Another important transition on the

horizon is the PBS ACE project that will automate a tapeless workflow environment for the network. Two important players in the transition to ACE are among our monthly contributors: André Mendes, Chief Technology Integration Officer for PBS, who oversaw the design of the system, and Bill Hayes, director of engineering for Iowa Public Television, which will be the first PBS statewide network in the country to install ACE. In a special report, André and Bill discuss the design and implementation aspects of the project, which represents one of the most prominent examples of the movement to integrate broadcast with IT.

And finally, in this issue's review section, Stephen Murphy takes the new Sony HVR-FX1 HDV camcorder out for a spin. No other camera has created more buzz in the professional and high definition market over the past six months. Is it ready for primetime? Read for yourself.

Tom Butts
Editor

tbutts@imaspub.com

LETTERS

Send to Editor, TV Technology at e-mail tvtech@imaspub.com

A Man of Many Talents

Dear Editor:

Regarding Jim Withers' article "Did Howard Hughes Invent VOD?" (Feb. 2); the real inventor of VOD was another Texan, Lyndon B. Johnson, President of the United States, two years before Hughes!

I, like Mr. Withers, was an enlisted man, but in the Army, from 1966 to 1969. Due to an unusual recruitment process while I was in Basic Training at Ft. Knox, Ky., I ended up having my MOS (Military Occupational Specialty) switched to TV Equipment Repairman by a branch of the White House Communications Agency. I completed electronics training at Ft. Monmouth, N.J., then was assigned to the White House Communications Agency, serving in both Washington, D.C. at the Old Executive Office Building (next door to the White House) and at the LBJ Ranch in Stonewall, Texas.

In Washington we were assigned the duty to record every news broadcast that aired in Washington on the network stations as well as the independent stations, 24/7, on alpha wrap helical scan Ampex one-inch VTRs. The OEEOB housed the headend for what was then more of a community antenna system than a true CCTV, but we did have one channel that we could (and did) play back any news broadcast on demand. (As far as I know, all of those tapes still exist, transferred to the LBJ Presidential Library in Austin after President Johnson left office.)

Additionally, Lady Bird Johnson liked "Gunsmoke," so we would record each episode every Monday, as I recall, on the same Ampex VR-2000 machines that Mr. Withers used. Not unlike Mr. Withers, we would get a phone call from a third party (someone in the White House Physicians office; why that office, I don't know) that Lady Bird wanted to watch the last episode of "Gunsmoke" that she hadn't seen yet (she

usually ran several weeks behind). So we would pull down the earliest episode we had on the shelf, thread it up, call the physician's office and tell them we were starting playback at 9:10 p.m., or whatever, and Lady Bird would watch her show. Oh, and we had to skip the commercials too; not an easy task, when the timer on those VTRs was only measuring time by counting the footage passing by on a roller. After the show was over we would get a thank you call from the physician's office, and we would put the tape back on the shelf for use to record the next episode.

In Texas, we again recorded the episodes on the Ampex one-inch helical scan VTRs and played them back on demand whenever the Johnsons were at the ranch.

As many know, President Johnson owned a station in Austin, Texas. The ranch was located about 60 miles from both Austin and San Antonio, with hilly terrain in between, so there was a 300 foot tower at the ranch with four cut yagi antennas per channel to provide enough signal strength for reception on the community antenna system. I have second-hand information that President Johnson was watching his station out of Austin one night when the signal was overridden by a station on the same channel from Waco, coming in on the back side of the antennas from more than 150 miles away, due to skip. It is said that President Johnson wanted his staff to call the station in Waco and have them shut off their station so he could watch his station from Austin, but cooler heads talked him out of the call! I don't know of any time that President Johnson called his station and requested a particular show, however.

Thanks for the memories.

Steve Godsey
Action Video Productions, Inc.
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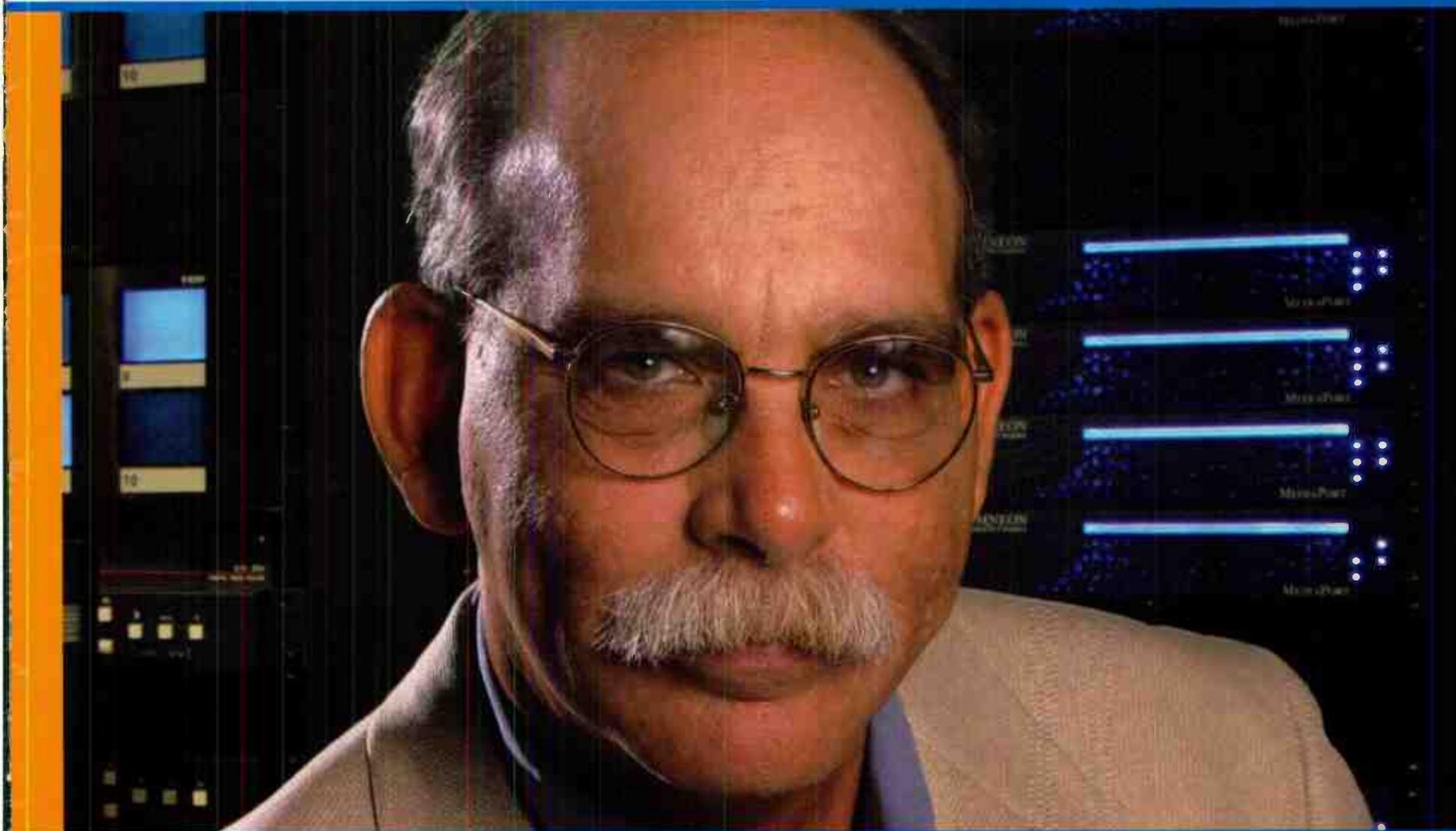
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and Technical Operations
KLCS-TV/DT, Los Angeles

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Making the Rounds with NASCAR

Fox Sports pushes the envelope on live racing

by Claudia Kienzle

LOS ANGELES

For its live NASCAR events, Fox Sports employs more equipment than is typically used for Super Bowl telecasts. Broadcast live in 720/60p HD, NASCAR on Fox in HD employs more than 40 cameras—including HD, robotic, wireless handheld, and aerial—to capture the excitement of this increasingly popular sport from every vantage point.

“Every race is like a Super Bowl as far as equipment levels for video, audio and graphics,” said Artie Kempner, lead director for NASCAR and NFL for Los Angeles-based Fox Sports, (Kempner is based in Wilmington, Del.). “We’re covering 43 cars zooming around a track at 200 miles per hour. Because we have a lot of track and cars to cover, we really put the equipment load up high for NASCAR.”

BIRD’S EYE VIEW

New this year is a unique Cable Cam, which captures a high-def aerial picture as it moves high above the racetrack. California-based Cable Cam brings a six-man crew to set up the system that flies in an X, Y, Z axis along two trusses suspended 20 feet above the racetrack. It takes two men to operate it—with one to move it while the other operates the camera—to get the shots Kempner calls for.

“It’s a ‘Wow’ shot. It’s a view you’ve never seen before except in videogames,” said Kempner. Fox Sports employed Cable Cam for the Daytona 500 in February and will use it on select events of



The Fox Sports crew prepares for another NASCAR race.

“Every race is like a Super Bowl as far as equipment levels for video, audio and graphics.”

**—Artie Kempner,
Fox Sports**



The Fox Sports “Pitcam” captures footage from the racing pits.

its Nextel Cup Series NASCAR races (akin to the major leagues), but not for the Busch Series NASCAR races (akin to the minor leagues). However, during Busch races, Fox Sports does use a camera crane and a streaming graphics ticker listing the standings of the drivers.

Fox is editing its HD footage from this season’s NASCAR races using AJA Video’s KONA 2 platform on an Apple G5 with Final Cut Pro.

TRACKING CARS AND DATA

The Nextel Cup races also feature the Fox Trax system, (basically Sportvision’s RaceF/X technology re-branded by Fox Sports), which helps illustrate the standing of the drivers throughout the race. To achieve this real-time graphics display, a GPS (Global Positioning Satellite) device is placed in every car in the race to track its exact position, and that tracking data is transmitted to several base stations around the track. Refreshed every 10 seconds, that data is then fed

to a bank of SGI Onyx computers and used by Sportvision’s real-time graphics systems to generate balloons, highlights, flags and other graphics pointers displaying various car-specific performance statistics.

Fox Sports also employs a wireless in-car camera system from Odenton, Md.-based Broadcast Sports Technologies (BST), that gives viewers a driver’s

perspective—by placing tiny cameras on the bumpers, hoods, and interiors of several of the racecars. These cameras, heavily modified by BST, relay a digital signal to a microwave relay on a helicopter that hovers overhead for six hours, which in turn relays it to microwave receivers on the roof of the BST truck in the truck compound.

TRUCKLOADS OF GEAR

This year, the truck convoy has increased from seven to nine trucks, primarily supplied by Pittsburgh-based NEP SuperShooters. NEP’s ND-1, which serves as Unit A, was retrofitted specifically for NASCAR in HD (see sidebar for equipment list).

At the foundation of the NASCAR telecast is a 448 x 448 PESA Cheetah router that’s robust and powerful enough to provide 400 paths of full 1.5 Gbps streams of HD inputs and outputs, as well as SD and audio I/Os.

Fox Sports’ Senior Audio Mixer Fred Aldous uses a Calrec audio console to mix hundreds of audio sources for 5.1-channel surround sound. Among the audio sources this year are in-car radios with which the drivers talk to their crew chiefs and spotters.

“They pre-set all the different frequencies and then we use a hard drive to record their conversations, and with permission, edit them for use on-air,” says Kempner. “NASCAR is an RF frequency nightmare. There may be a thousand signals competing for channels.”

ZOOM ZOOM

The Canon HD zoom lenses make a huge difference in the kind of pictures Kempner says they can now show viewers. “With image stabilization at 100:1, we’re able to zoom into the drivers’ compartments and watch them handle the steering wheel as they come around the turns,” Kempner says.

The Daytona 500 featured an exciting camera shot captured from the in-field side of the track with the cars racing only

50 feet away as they came around the turn. “That was a really a tough shot to get,” said Kempner. “Since we won the Emmy for Outstanding Sports Series in 2001, we’ve had virtually the same production crew and they do an incredible job. We’re all passionate about this sport, and that motivates us to deliver what we hope is a very exciting NASCAR experience.” ■

NEP ND1 Gear

(partial list)

- 12 Thomson LDK-6000 Worldcam HD and SD cameras
- 6 Thomson Worldcam handheld cameras and Thomson LDK 6200 Super SloMo cameras
- 2 Panasonic Varicam camcorders with Fujinon 22x7.8 lenses
- 8 Canon 100X HD Zoom lenses plus one Canon 86x HD lens
- Grass Valley Kalyso Duo switcher 3.5 M/Es with an Abekas DVEous Dual Twin HD DVE
- 2 Sony SRW-500 HD VTRs
- EVS HD Spot Box and 7 EVS HD Live slo-motion systems



Fox Sports uses a Cable Cam to capture hi-def aerial views.

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Transmitters Energized by Power, Control

High power, greater efficiency and easier control are the new fundamentals

by Bob Kovacs

FALLS CHURCH, VA

The computer revolution has now reached transmitters, making remote control and monitoring as easy as logging onto the Internet. At the same time, stations that haven't yet gone to full DTV power are keeping manufacturers busy with orders for high-power components.

With a July 1 deadline to go to full power nearly upon us, many stations that began DTV broadcasts with low power have now either faced upgrading or will do so in the next couple months. The alternative to raising power is the permanent loss of some of a station's coverage area, a choice that is no alternative at all.

Although many broadcasters began their DTV broadcasts with full—or at least high—power, many met their FCC obligation by firing up a low-power transmitter with a promise to switch on full power at the right time. Knock, knock... this is the right time.

UPTICK IN ORDERS

Orders for high-power equipment are pouring into manufacturers, as stations rush to complete their requirement in time for the deadline.

"We've definitely been seeing an uptick in orders once the maximum date started to hit," said Dave Glidden, director of television broadcast products and services for Harris Broadcast. "Most of our customers that need to be on with their maximized footprint seem to have

made the decision to do so; we don't see a lot of [broadcasters] in the top-100/top-four network affiliates standing off the side and saying 'We don't care about the outer edges of our signal.'"

Other transmitter manufacturers also see a rush of orders from stations cutting it close to the July 1 deadline. Rich Schwartz, director of marketing and product management for Axcera, said there has absolutely been a last-minute crush of high-power orders.

"It's pretty tight but we feel that we'll make the deadline," he said. "Getting the transmitters installed is a real challenge, however."

Dick Fiore, senior vice president of sales and marketing for Thales Broadcast, is pleased with the charge to high power.

"Orders this year are exceeding our expectations," Fiore said, "and we expect next year to be just as busy."

A fortuitous conversion of technology is happening right at the moment television stations must go to full DTV power. Most of these stations will be on UHF channels and the latest high-power tube technology is making a real difference in the efficiency and operating cost of high-power digital broadcasting.

Tube manufacturers have introduced



The Larcen Eclipse high-power solid-state UHF transmitter

depressed-collector technology to the inductive output tube (IOT) that has been in common use for UHF transmitters since 1990 or so. A depressed collector in an IOT scavenges power that would otherwise have been lost, reducing the input power required for a given output.

The most advanced version of these tubes uses multistage depressed collector (MSDC) technology that raises the complexity of the transmitter even as it dramatically lowers the station's utility bill. Manufacturers such as Axcera, Ai, Harris, Thales Broadcast and Larcen are now shipping high-power DTV transmitters with MSDC IOT tubes.

"We're comfortable that [MSDC IOTs]

are a good technology," Glidden said. "From what we've seen, these tubes are definitely living up to their efficiency claims."

TAKING CONTROL

Not long ago, remote monitoring of transmitters was an expensive, proprietary process that was considered a necessary evil. However, monitoring and control of transmitters using the Internet is rapidly taking hold in the industry, reducing the cost of remote control and dramatically improving monitoring ability.

Just one benefit is the ability to check the transmitter from anywhere you have Internet access, including from your hotel room while you're attending the NAB. In fact, the transmitter's manufacturer can monitor the transmitter as well, advising you of any issues well in advance of any problems and upgrading firmware on the transmitter's control system.

In the case of Harris, the its new PowerCD transmitter has a built-in Ethernet port that works with the company's eCDi monitoring and control system to provide browser-based control of the transmitter. Other Harris transmitters, as well as the transmitters from other companies, require a separate control module that plugs into the transmitter to provide Ethernet connectivity.

The benefits of browser-based transmitter control make sense as soon as you see it in action.

"Whether you're operating [the transmitter] remotely or locally, it has exactly the same look and feel," Glidden said.

The parameters that can be monitored and controlled far exceed what older proprietary systems could handle. Browser-based monitoring systems keep track of fans, pumps, tube voltages and current, exciter parameters, filter status, RF output and ambient temperature. Since a computer is used to provide the Ethernet connectivity, the same computer can store these parameters for later recall and examination.

Axcera's Schwartz also sees an interest in Internet control but said that there is still strong demand for dialup systems that connect directly to the transmitter. In addition to controlling and monitoring the transmitter, he said customers want access to just about all information at the transmitter site, including things as diverse as tower lights, operation of building HVAC systems and outside temperature.

From the perspective of U.S. broadcasters, DTV has become a reality and the domestic market for analog transmitters has slowed considerably.

"There's a lot less [activity] than there was a couple years ago," Glidden said. ■

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DTV Rides the Rails

Atlanta first in the U.S. to deliver broadcast content to subway

by Craig Johnston

ATLANTA

Railway commuters in Atlanta will soon have an alternative to their newspapers, paperbacks and laptops: the city's Metropolitan Atlanta Rapid Transit Authority (MARTA) begins hosting the first television and radio network for rail passengers in June.

Atlanta ABC affiliate WSB-TV is partnering with The Rail Network (TRN), a New York-based company that develops multimedia delivery technology for subway and commuter rail systems, to provide news content on five 15-inch screens in each of MARTA's rail cars. Newscast audio, along with three music

channels, will be available in English and Spanish on unused FM channels in the market. Passengers will also be able to tune into the MARTA Information Channel, which will provide important operational and service announcements.

INSTANT RECOGNITION

The choice of news programming was deliberate said David Lane, CEO of TRN. "The commuters step onto the train, they see the network affiliate newscast that's on, and no matter when they get on the train they can engage themselves."

Partnering with a local network affiliate gives the service instant recognition and credibility, and eliminates the need for TRN to build a news department. "That's why we contract with a single network affiliate in each market," said Lane, "because they are the experts in doing and providing content for that local market."

Although the financial terms between TRN and WSB were not disclosed, TRN says that when it expands to other cities, it plans to put the content supplier partnerships up for bids.

Supplying news material to TRN will be transparent to WSB itself. Other than supplying some tailored ins and outs to customize the presentation, the station will produce its daily newscasts as normal. The newscasts will be downlinked into TRN's North American digital facility in Atlanta. "As soon as that content is brought in, we'll provide the Spanish translation on the secondary audio channel," said Lane, "and all of that content will be immediately sent out to each of our trains."

Content will not be received continuously by the trains, but rather in "wireless zones" established along the rail transit's path. Content will move from TRN's digital facility to the wireless zones via a private network, then sent aboard the train itself via WiFi.

"To the train rider, the newscasts will be seamless," said Lane. "It's a completely automatic wireless distribution system. There are no manual tapes or operational assistance from any person onboard the trains whatsoever."

Each train has a server aboard to store content. TRN has an established schedule that puts news, weather, sports and other segments at a particular time each hour, along with commercial content. The news content gets a major refresh each time WSB airs its morning, noon, evening and late night newscasts.

"The MARTA trains run 20 hours a day," Lane said. "Every time a train hits one of the wireless zones, the infrastructure on-board performs a search for new content, pulls down what's new, substitutes it for the old content and starts playing it."



Commuters on Atlanta's MARTA system will soon be able to listen to broadcast content on radios or cell phones with FM receivers.

This system assures there will be continuous programming aboard each train car even if the transit system runs behind schedule or is stopped temporarily.

Breaking news that WSB broadcasts throughout the viewing day also can be downlinked at TRN's facility, processed and pushed out to the wireless zones to be picked up by the trains and inserted into the news material.

Audio and video are distributed from the server to screens and FM transmitters on the trains via TRN's patented wireless technology.

Sound for TRN's newscast and audio-only content is only available via an FM signal so that it won't bother passengers not wishing to hear it. Riders with personal FM radios or a cell phones with FM headsets will be able to listen.

FREE FM

To get riders enthusiastic about the new service, TRN will distribute up to 230,000 FM radios to MARTA rail riders during the initial launch period. Newscast material is also captioned for those without listening devices.

"There's an emergency messaging platform where we can provide AMBER alerts, homeland security messages, state and federal messaging, that will crawl across our video displays," said Lane.

TRN's service is offered at no charge to riders, and advertising revenue will allow the service to contribute revenue back to MARTA itself over the life of the 10-year contract. Advertising is not new to public transit.

"The rail audience has been bought since transit has been selling advertising, almost a hundred years," said Lane. He pointed to decades of research into transit advertising by third party firms like Scarborough, and Arbitron. "They have qualified this audience for decades and decades."

He said changing to a television ad from the static printed material histor-

ically used on transit is easy for advertisers. "Now they can use television, the most effective medium, and there's no creative costs because they can use the same units they've already produced for network TV."

The commercial loads for TRN's newscasts will be similar to those seen on broadcast TV during the particular dayparts.

Lane pointed to advantages for the network affiliate news department getting involved with TRN. "It's really the network affiliates' opportunity to help brand themselves, to help reach an audience that was unreachable," he said. "A large percentage of the DMA rides the rail system in each of these markets, and it's been an untapped market from the broadcast side."

Atlanta's mayor says she sees a big upside to the TRN service as well.

"By bringing this valuable service to MARTA and its rail passengers, The Rail Network is helping to strengthen Atlanta's reputation as an innovative technology center," stated Atlanta Mayor Shirley Franklin. "The Rail Network's service will benefit both commuters and companies doing business in Atlanta."

Because rail transit systems are public entities, deals for service in other metropolitan areas require public bidding. At present, that process is underway in Washington, D.C. and Vancouver, B.C. TRN said it is in discussions with a number of other municipal transit authorities in North America and abroad, and expects bidding processes to commence in several soon.

TRN will manage news material in any new North American markets from its current facilities in Atlanta. "Our production facility can manage multiple markets at the same time and be able to pull down the content that is specific to each market, and essentially manage that content and get it out to the trains for each individual market," said Lane. ■

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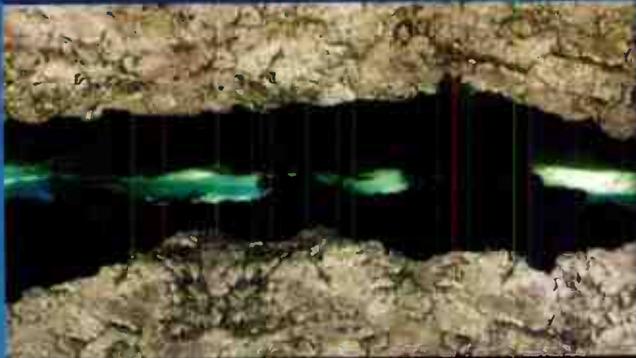
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CONTINUED FROM PAGE 1

His appointment comes amid DTV lawmaking that may require him to oversee the end of analog television transmissions. The upside for broadcasters is that Martin was the only member of the commission who did not vote against multicast must-carry when the issue was considered in February.

"It should be kept in mind that this decision will have the most adverse impact on small, independent, religious, family-friendly and minority broadcasters," he said after the vote.

Martin succeeds Michael Powell, who, after more than seven years with the FCC, finally made good on persistent reports that he would step down. Powell toyed with the press about whether or not he would leave until Jan. 21, when his staff was sent into scramble mode after news of his departure appeared in the Wall Street Journal.

Eddie Fritts, the outgoing chief of the broadcast lobby, said Martin was the "right person at the right time to lead the FCC. Kevin has a passion for public service and a deep understanding and appreciation for the value of local broadcasting."

TOUGH ON INDECENCY

A native of Waxhaw, N.C., and the fourth of five children, Martin inherits an agency in the height of celebrity. Public response to revised media ownership rules and a pitched debate over indecency catapulted the FCC into the public limelight during 2004.

Martin, whose contemplative demeanor is in contrast to the more freely associating Powell, is expected to be tougher on indecency than his predecessor. He favored fining a Kansas station "per utterance" last December over

a show featuring nude Twister and other adult content, and he balked when the FCC first decided against fining NBC for Bono's adjectival F-word at a 2003 awards show. He does, however, support letting affiliates reject network content they find inappropriate for local audiences.

Indecency crusaders were pleased at Martin's ascension.

"It should be kept in mind that this decision will have the most adverse impact on small, independent, religious, family-friendly and minority broadcasters."

—FCC Chairman Kevin Martin on the vote against multicast must-carry

"Just in the past year, the FCC has deemed topics such as bestiality, masturbation, oral sex, anal sex and pedophilia fit for children to watch on primetime network television," said Parents Television Council President Brent Bozell. "This irresponsibility must stop and with the leadership of Chairman Martin, we are confident it will."

Mindful of recent discourse on regulating cable content, the new chief of the National Cable and Telecommunications Association, Kyle McSarrow, issued a carefully measured response to Martin's promotion.

"We look forward to continuing to work closely with Chairman Martin to maintain a deregulatory environment for competitive telecommunications services," he said.

Indecency wasn't high on Martin's radar early in his tenure at the FCC, but ownership was when he said it was

"time for the commission to recognize that the nature of broadcasting may no longer be so uniquely situated as to be un-deserving of full First Amendment protections."

Media ownership vexed the former chairman from the start of his tenure, when Fox lawyers convinced the U.S. Court of Appeals in Washington, D.C. to make the FCC prove its rules were

consumer electronics industry. Much to the delight of that industry, Martin generally comes down on the side of new technology. In his own acceptance statement, Martin said he looked forward to continuing Powell's "efforts in bringing the communications industry into the 21st century."

Dave Arland, vice president of government relations at Thomson described Martin as having an "excellent grasp" of new digital and broadband technology.

"He has the intellect and the political acumen to become a truly great chairman," Arland said.

Martin emerged as an independent thinker at the FCC in 2003 when he voted with the Democrats to continue making phone companies lease lines to competitors.

Among those he beat out for the chairmanship include Rebecca Klein, former head of the Texas public utility commission; Michael Gallagher, head of the National Telecommunications and Information Administration; and Janice Obuchowski, former head of the NTIA, who were also on the short list for the job.

At press time, Earl Comstock, a former aide to Ted Stevens (R-Alaska) and a partner in Washington D.C.-based law firm Sher & Blackwell, was said to have a lock on the spot left vacant by Martin. Another Republican seat that would open with the expected exit of Kathleen Abernathy was expected to go to Klein, if she wanted it.

Before joining the FCC, Martin served as a deputy general counsel for the Bush campaign and an advisor to former FCC commissioner, Harold Furchtgott-Roth. Martin holds a law degree from Harvard, a Masters in public policy from Duke University and a B.A. from the UNC at Chapel Hill, N.C. ■

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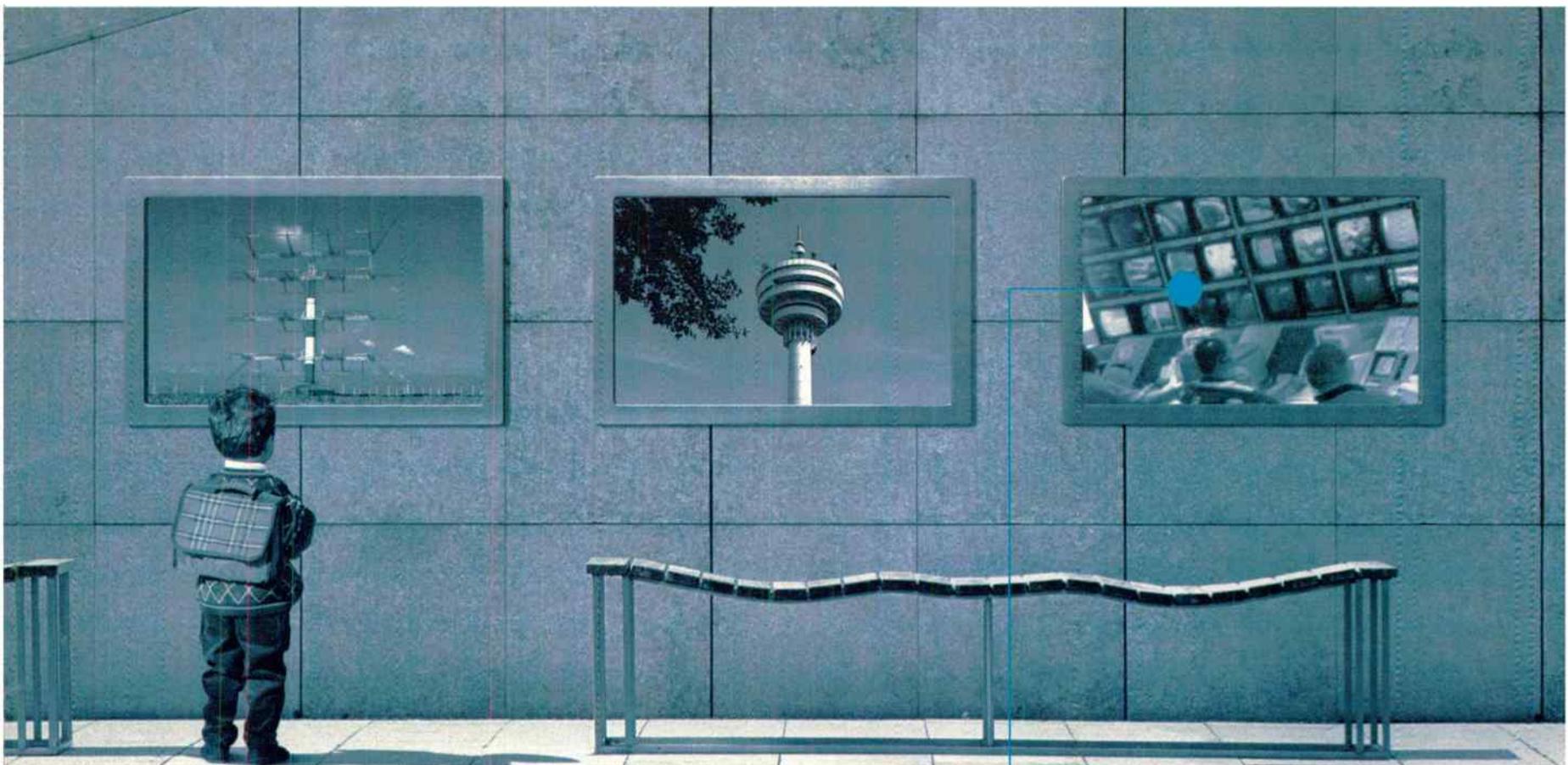
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Making the Past Last

KET digitizes its history

by Robin Berger

LEXINGTON, KY.

Kentucky Education Television (KET) was sitting on a massive historical treasure trove nearing the end of its shelf life. Compounding this urgency, "our records were marginal," said Mike Clark, director of program operations.

In January 2003, \$600,000 in preservation grants came through. And now, Phase One of its first-of-a-kind digital archive is coming to fruition. Management believes digitization of the first cache of tapes will be done by the end of April. Phase One should end, if all goes according to plan, sometime in June.

Preservation has always been a concern at the 36-year-old statewide public broadcasting network. In the past, KET dealt with the issue by converting the deteriorating archives en masse from a quad format to one-inch videotape.

"It was a very expensive proposition,

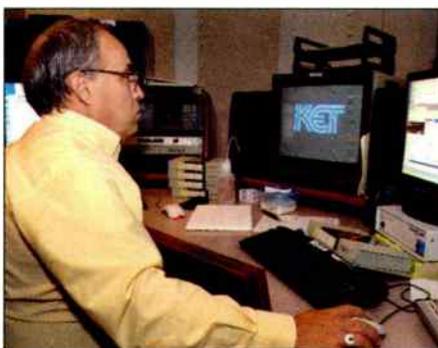
and when you're done, you're left with a tape that would only be good for another 10 years," said Clark. "By digitizing this, we hoped to significantly increase the life of the asset and, hopefully, never have to handle the physical asset again."

Specifically, "we wanted to take care of some old tapes—clean them, stabilize them, transfer them to digital format and then manage them electronically," said Lisa Carter, who initially served as project manager of KET's digital video conversion initiative (Laura Krasnow took over Feb. 1, when Carter became director of archives at the University of Kentucky).

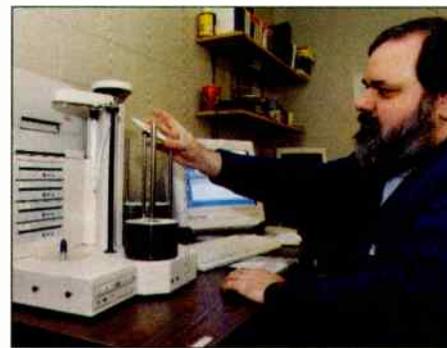
CLEARING HURDLES

The first obstacle was money. To optimize the budget, the team concentrated on approximately 6,564 one-inch and 3/4-inch tapes.

Selecting the right technologies was



Larry Mitchum validates metadata after the system digitally ingests a one-inch tape from the KET archive



Paul Stackhouse, director of Web and multimedia services at KET, demonstrates the DVD robot.

the second challenge.

"Until late 2002, the only reasonable storage mechanism for large video was SCSI-based servers, which are very, very expensive," said Clark. "In late 2002, we began to see the first of what now is pretty common: IDE-based hard drives and NAS arrays. We jumped on that technology because the savings were enormous—by a factor of 3:1 in some cases."

According to Paul Stackhouse, KET's director of Web and multimedia services, the 10 Xtore NP-1080 NAS servers have a total storage capacity of 20 terabytes. Using a variable bit rate MPEG-2 format, the 3/4-inch tapes are recorded with a 4.5 Mbps target, and the one-inch tapes at 8 Mbps. KET recognizes that these are acceptable broadcast rates, but they are not edit-quality (15 and 25 Mbps).

"We could have recorded at higher rates but the storage requirements would have been enormous," Stackhouse said.

The NAS servers are based on parallel ATA hard drives—eight Maxtor 300 GB drives in a RAID 5 configuration.

"They were pretty new when we purchased them in late 2003, but the technology was reliable," he said.

After speaking to a number of vendors who did everything from digital asset management to software and hardware solutions and video transfer, the KET team discovered that "no one service provider could really meet our needs," Carter said. Among the most difficult to fulfill was the requirement that the tapes stay on KET's premises.

The PPS Group, a Cincinnati-based digital archiving services provider, agreed to this proviso and came on-board in October 2003.

OTHER TECHNOLOGIES

PBCore, the Corporation for Public Broadcasting's metadata dictionary, was chosen to describe KET's assets. PBCore is based on the Dublin (Ohio) Core Metadata Initiative, an internationally recognized standard used by libraries and other institutions. (PBCore is reportedly scheduled to be released in early April.)

One of PBCore's most attractive features is its compatibility with the Next Generation Interconnection System (NGIS) that is being developed by PBS. The IPTV platform-based NGIS will become a PBS content distribution system in 2006, coinciding with the advent of PBS' new satellite leases.

"As the technology evolved, the possibilities expanded from merely archiving the material to creating unique systems of cataloging for wide-ranging accessibility," noted Laura Krasnow, KET's media asset manager.

KET also chose FileMaker Pro database software and the Digital Rapids encoding system (the equivalent of a StreamZ box, with an OptiBase decoder). Virage's VS Archive content management solution with VideoLogger indexing software (run on three workstations), configured with The Autonomy Group's (the parent company of Virage) SoftSound speech and on-screen text recognition modules rounded out the technology platform.

DVDs provide backup to the file system, produced by Amtren's Flexwriter SA4 Publisher recording system and Padus DiscJuggler.NET software. KET wrote its own software to interface with DiscJuggler.NET to customize face labels and print the wrappers for the DVDs. The network also provided manpower to put each DVD in its wrapper. More than 5,000 DVDs—one DVD per tape—were made during the testing phase, begun in December, to the first official month of production, which began in mid-February.

To date only a dozen or so tapes could not be salvaged, said Clark—impressive odds that he attributed in part to a serendipitous fluke.

"I think we lucked out, to some extent, [because] we kept the environment consistently bad—better than changing it one way and then another," he said.

The next step is to give KET's producers, staff and management easy access to the data so that they can work from their desktops. ■

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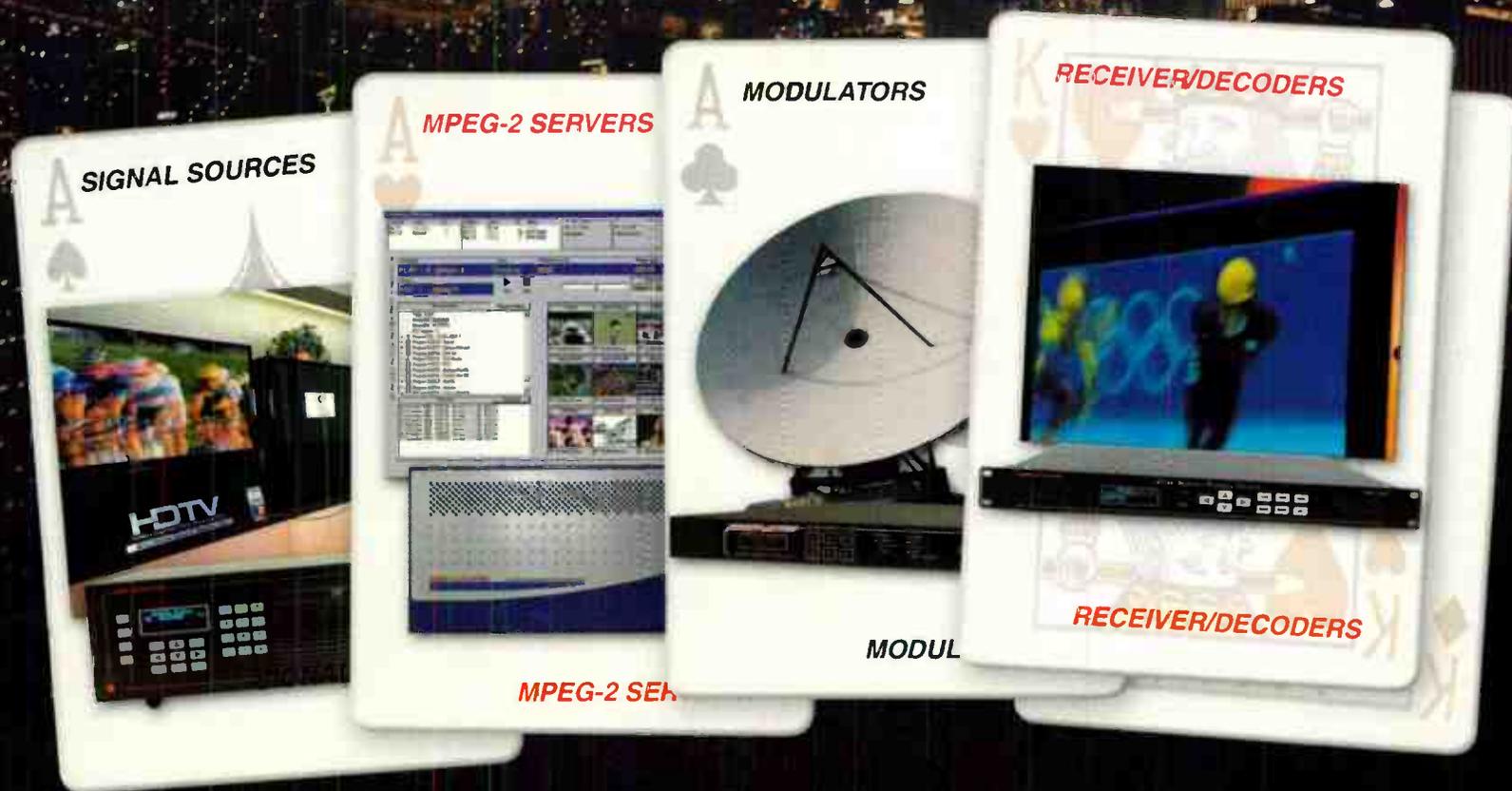


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HD Gives NASA a New View

Agency invests in new video gear for the return to space

by Susan Ashworth

CAPE CANAVERAL, FLA.

After countless months of research and development, NASA is resuming one of its primary objectives—sending people into space to chart and explore the reaches of the universe.

The agonizing work that went into finding out what went wrong with the space shuttle Columbia in February 2003 led NASA's Columbia Accident Investigation Board to conclude that more information is needed about exactly what happens when a shuttle takes off into space.

And one of the best ways to obtain clear, precise footage? high-definition imaging.

"Progressive HDTV at 60 frames per second provides significant improvement, both spatially and temporally, over the NTSC video we had been using for quick-look analysis of the vehicle's configuration and performance during ascent," said Rob Stute with the Operational Spaceport Projects Office at Kennedy Space Center.

Staying on the cutting edge of technology has long been one of the agency's primary goals, and in May, when the space shuttle launches resume, more cameras will be examining the shuttle's ascent than ever have before.

When the space shuttle Discovery launches from the Kennedy Space Center in Cape Canaveral, Fla. in May, the agency will have installed dozens of short-range tracking, medium-range tracking and long-range tracking cameras around the launch pad and all across the Kennedy Space Center. The goal is to focus on the external tank and solid rocket boosters, as well as the orbiter as the space shuttle makes its return to space. Tracking cameras and long-range optical systems will also be posted for several miles up and down the Florida coast.



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Fast Facts

Orbiter: Discovery

Mission: STS-114

Launch: May 15, 2005 @ 3:50 a.m. EDT

Site: Kennedy Space Center (KSC), Fla.

Landing: May 27 @ 10:45 a.m. EDT

Site: Shuttle Landing Facility, KSC



Thirty Panasonic AK-HC900 HD cameras will be deployed to record the space shuttle's return to space next month.

Thirty of those HD models will be Panasonic AK-HC900 high-definition progressive-scan cameras, several which will be positioned at Kennedy's launch pad system close to the orbiter—in shielded enclosures—to provide NASA with high-definition images of the launch for scientific image analysis, range safety and vehicle status assessment.

According to Panasonic, these AK-HC900 cameras are 3.9-pound models that offer 720 progressive high-definition output at 60p. The camera employs three 2/3-inch 1-million-pixel IT CCDs.

NASA also plans to outfit 14 of the Panasonic AK-HC900s with specialized long focal-length optics, which will be positioned on the perimeter of the Kennedy Space Center to track the ascent of the Discovery orbiter. These cameras will provide real-time high-definition images for mission flight analysis during the critical first three minutes of the orbiter's ascent.

HIGH IN THE SKY

To meet NASA's need for additional high-altitude views of the shuttle's ascent, high-definition technology will also be taking to the air—60,000 feet in the air, to be precise.

NASA is building an HD/SD video system into the nose section of two high-altitude research airplanes that will be in the air while Discovery is ascending into outer space.

Each aircraft will be equipped with an AK-HC900 720p HDTV camera running at 60fps, a near-infrared camera from Sensors Unlimited and a Sony DXC NTSC camera that has been modified for low temperature/low pressure use by Sekai Electronics. The primary telescope, mirrors, cameras and lens are attached to a stabilized system manufactured by Southern Research Institute (SRI), a Birmingham, Ala.-based center for scientific discovery and technology development. Although HD will be the primary imagery component to capturing the launch, NASA is also using an NTSC camera with its own zoom lens, which



The Discovery crew is shown with the External Tank 120, which will carry the fuel for the next space shuttle flight. A newly installed digital camera will transmit photos of the external tank photos to engineers on the ground.

provides a wider field of view for the operator to find the target if manual tracking is required, said Rodney Grubbs, chairman of the NASA DTV Working Group.

"While the government has several airborne assets, none of them had the long focal length and dynamic range that the shuttle program sought," Grubbs said. "NASA has two high-flying WB-57 aircraft that could serve as a platform for a sensor. Given the short time we had to work with, we had to either use commercially available products or build from existing platforms."

NASA turned to SRI for a turret gimbal system to control the video. The Marshall Space Flight Center in Huntsville, Ala., developed the remainder of the system.

"Hopefully very soon we'll have the system mounted to the WB-57s and some imagery to prove we accomplished our goal," Grubbs said.

The two WB-57 jets with these nose-mounted cameras and infrared sensors will provide data and high-definition video from a high altitude, providing engineers on the ground imagery of the Discovery's ascent when it hits 60,000 feet until the shuttle is near the Earth's orbit.

Sources said NASA is spending \$40 million to upgrade the imaging system at the Kennedy Space Center and \$9 million to modify the WB-57s.

A NEW ORBITER

Though the orbiter will appear unchanged from the outside, on the inside it's a different story. Wiring has been added to the umbilical well under Discovery to accommodate a digital camera, which will transmit photos of the external tank to engineers on the ground. When the tank is separated from the shuttle, an automatic sequence will capture 24 images—at one frame every 1.5 seconds—that will be downlinked to Mission Control at the Johnson Space Center in Houston. Previously, separation photos were captured on a film camera, and managers had to wait until the orbiter was back on the ground to obtain the negatives, according to NASA.

NASA is also installing cameras on the external tank of the shuttle and on the two solid rocket boosters.

"Motion picture film is still our primary media for detailed image analysis, but HDTV will be a great tool for the quick-look analysis that is performed shortly after launch," Stute said. ■

Comcast Moves to Protect, Expand Content

Motorola, TiVo deals extend cable operator's reach

by John Merli

PHILADELPHIA

Comcast is moving with deliberate speed this spring to help secure its already considerable influence in the increasingly flexible media universe that digital TV demands. Within a week, the MSO expanded its partnership with Motorola beyond mere set-top boxes and quickly announced another long-term deal with TiVo which may have saved the DVR pioneer from going the way of the dodo.

TiVo simply may be pinching itself right now, hoping its new long-term partnership with Comcast isn't simply a dream. Judging from initial Wall Street reaction, the Comcast deal already has pumped new life into the DVR provider, whose early growing spurt appeared to be stuck on Pause for the last few years. When fair-weather friend and partner DirecTV made it clear at this year's CES that it no longer would require TiVo's services, things looked rather bleak for the little-DVR-engine-that-could. TiVo currently has three million subs (or barely two-percent of TV households) who pay about \$10 monthly.

SECURITY BLANKET

In a separate multi-year commitment with Motorola to purchase more than \$1 billion in STB hardware-software, Comcast appears to have made the biggest single financial deal of its kind ever undertaken by an MSO in North America. Although much of the Comcast deal actually extends a current agreement with the nation's largest MSO to purchase boxes, perhaps more significant in the long term is their agreement to form two joint ventures exploring further development and licensing of conditional access and other technologies.

Motorola has been granted a non-exclusive license for MediaCipher, its own conditional access technology, and Motorola and Comcast will jointly manage a new development group. The dual ventures also include securing other licensing for conditional access venues—along with R&D on interactive program guides, as well as providing middleware to competitors.

The addition of TiVo's well-known brand of digital recording capabilities to the Comcast menu is just that—an addition, not a replacement. "We will be creating two DVR options for our customers," said Comcast spokesperson Jenni Moyer. "We find that customers seem to love the DVR we already offer, which has all the options that you expect in a DVR, like pausing live shows, recording a couple of programs at a time while you watch a third, and so on.

"With the TiVo version, the capabilities will also permit viewers to record movies based, not on titles, but on the

names of actors or directors they like. And in a few seconds they can set up to record an entire season of the same series. TiVo software will also allow a subscriber to control his DVR remotely, such as from work, by going online to a special Web site and setting it from their computer," Moyer said.

New TiVo software will be developed exclusively for the MSO, incorporated into Comcast's existing network platforms and run on Comcast's DVR platform—using the dual-tuner, HD-capable, DCT6412 Motorola box. The new DVR service will be marketed with the TiVo brand, and is expected to be available from Comcast in a majority of its markets by late 2006.

Moyer's description of the TiVo box

could indicate what Comcast's selling points might include in the months ahead: "They have a really terrific brand and great customer loyalty, and with our TiVo box—you [also] will be able to do video-on-demand and high-definition. So you will have all three components—DVR, VOD and HD—all in our Comcast-TiVo box that you don't have now." (In fact, even the regular TiVo service itself does not have those attributes.)

TiVo does plan to continue marketing its traditional stand-alone service as Comcast pushes its own TiVo. Therefore, TiVo could find that it's competing with itself, and Comcast, for customers within Comcast's own markets. "The Comcast version of our software won't be available for more than a year," said TiVo

spokesperson David Shane. "And TiVo will continue to be available, of course, in markets where Comcast is not present. In those markets, I imagine, we'll be heavily focused on our standalone."

Shane said his company plans to make its entire suite of TiVo services available for anything that Comcast may wish to include for its subs. "It will be up to Comcast to decide what they may wish to include." Although it's widely presumed that Comcast's TiVo service will cost a few dollars more than the more generic and brand-less DVR now offered by Comcast, no fee structure will be announced for several months. Financial terms of the Comcast-TiVo deal have not been disclosed; the MSO did not make a financial stake, per se, in TiVo. ■

Avid

CONTINUED FROM PAGE 1

tomer base for Avid's future," said David Krall, Avid president and CEO.

"It used to be that an editor would be exposed to our equipment when they were in their 30s or 40s," Krall said. "This generation is being exposed to video editing in their teens. It's an important strategic move for Avid to make sure that they are relevant to this generation."

Krall also said that Pinnacle's professional broadcast solutions—such as the MediaStream server and Deko graphics system—will extend Avid's end-to-end broadcast solutions. "We see this acquisition as the next logical step in our long-term strategy," he said, pointing to the company's August 2004 acquisition of M-Audio, a manufacturer of digital audio and MIDI solutions, which gave Avid immediate access to the consumer audio market.

That acquisition has yet to turn profitable for Avid, Weinstock said.

There was no official word on the fate of Pinnacle's more than 650 employees, though Avid has said it

would maintain a presence in Mountain View, Calif., where Pinnacle is headquartered. Avid said it was also too early to tell exactly how the consumer division would take shape.

Still, Pinnacle believes the acquisition is a good move for Pinnacle's shareholders, employees and customers.

"The industry is in the midst of a consolidation, and it's happening in an aggressive way," said Ajay Chopra, co-founder and COO of Pinnacle. "In reality, there will probably be two or three major players in the digital video marketplace in the future, and we want to be one of those players.

"Our employees understand that this is a path forward, and our customers are telling us that this [acquisition] makes sense over the long-term," he said.

Some customers, however, are not so sure.

"Avid's public reason for the acquisi-

tion is that they want to leverage Pinnacle's consumer line of video editing products," said Jay Shaffer, a long-time user of audio and video editing systems. "Most observers are saying the real reason for the acquisition is to further narrow the field of broadcast-quality non-linear video editors. Overall my impression of the acquisition is that Avid is shoring up its defenses in the broadcast market against Apple and seeking to dominate the consumer video market on the PC platform."

On the day of the announcement, Pinnacle's shares rose 77 cents to close at \$5.74 on the Nasdaq Stock Market, while shares of Avid fell \$6.34 to \$56.61.

After the acquisition is finalized, which is expected next quarter, shareholders of Pinnacle will own about 15 percent of Avid. Avid's stock has risen 41 percent over the past year.

"Avid's acquisition of Pinnacle is an interesting opportunity and a challenge," Weinstock said. "It's also paradoxical because Pinnacle built its business on serial acquisitions. But they were [flummoxed] by one too many. Now Avid has acquired them. I hope that they're not going down the same road." ■



Ajay Chopra

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PBS

DIGITAL JOURNAL

Bill Hayes

Anticipating ACE

Working out the bugs in the first installation of the PBS automation system

AMES, IOWA

Readers of this column should be aware by now that IPTV (Iowa Public Television) was selected to be the first statewide PBS network in the United States to install the new PBS ACE automation system, which is scheduled to be operational by this summer.

Conceptually, ACE is a total program ingest and playout system for the multichannel broadcast environment. In IPTV's case the system will operate a four-SD, one-HD master control environment. Depending on the time of day, IPTV will operate either a single HD stream and SD stream for children's programming or four SD multicast streams.

The primary components of ACE

are the Broadview traffic systems, the OmniBus automation system, an Omneon media server, Miranda master control switching and monitoring, as well as a Masstech archive manage-

SOFTWARE COMPONENTS

In essence, three critical software components operate as a team in the ACE environment. The leader is the

The communication between the two systems is bidirectional and close to real time, so that changes made in programming from the network are rippled to the ACE station and vice versa. BroadView generates logs not only for playback but for ingesting as well. The librarian is Masstech which has access to our library of content, much of it local material.

OmniBus functions as the system operator coordinating schedules and assets—both physical and virtual—to ensure that all material is processed correctly.

No small feat, this requires a considerable amount of processing power. In the last set of documentation that I received, there were 11 servers in use by OmniBus for command and control of all the systems.

The entire ACE system, not including the SpectraLogic library, occupies six full equipment racks.

ment system controlling a SpectraLogic tape archive system. This system will then feed content to the nine digital and nine analog transmitters operated by IPTV throughout the state.

BroadView traffic system. In addition to controlling local traffic, the Broadview system at IPTV will talk directly to the BroadView system at PBS in Virginia.

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COUNT ON IT André V. Mendes

The ACE Design

By the time you read this column, the complete overhaul of content workflow within public television will have started. As described in my last column, the first changes will take place within PBS and will focus on the processes of ingesting programs, performing technical evaluations, screening for subjective content-related issues and eventually, archiving programs and interstitials into permanent storage.

MORE THAN MEETS THE EYE

Our goals for this process were easily stated, but as it turned out, accomplishing them took quite a lot of business process re-engineering, substantial inter-vendor cooperation and several exhaustive iterations of workflow analysis. Our aim was to create a system that would completely eliminate tape activities after ingest and simultaneously enable our content producers to migrate to file-based program submissions as system evolution allows.

The entire sequence of events starts with the creation of a program record in our database. Via the Web, program producers provide PBS with initial content metadata such as title, segment timings, air rights and other program-related information.

Eventually, we expect that the initial tape-based ingest will be replaced with Internet-based file transfers.

This initial process automatically triggers a variety of processes:

Through an XML-based Microsoft BizTalk interface, work orders for

ACE, PAGE 22

The entire ACE system, not including the SpectraLogic library, occupies six full equipment racks that are fairly tightly packed, and it is the job of OmniBus to make sure that everything works in harmony.

Of course, software is never finished and the features that you want will always be in the next version. On our latest conference call with the integrator, we discovered that OmniBus had released a new driver for the Miranda Presmaster switcher that evidently had some issues with switching and drop frame timecode. According to Marilyn Pierce, senior director of digital asset management for PBS, it turns out that 20:00:00:00 is the same frame count in drop frame NTSC as 23:59:59:29+1 frame in non-drop PAL.

The challenge of releasing products into the world market is that problems come from the most unexpected areas. It is critical that all the systems involved be operationally stable and reliable. Given the scope and complexity of the system, failures have to be few and far between and when they do occur, have to be automatically healed.

OPEN DOORS

My colleague André Mendes at PBS is one of the chief proponents of the ACE system, and although he

and I agree that the concept is a good one, there are some fine issues that we differ on.

The system uses exception monitoring for normal operation, so it essentially runs without any opera-

What I expect is that the basic system will work but that we're going on a shake-down cruise and we'll find some leaks along the way.

tor intervention. With that in mind, the system was proposed without any video monitoring associated with it. We had an interesting discussion on why anyone would want to waste money on monitoring since it was just going to show that everything was fine.

André believes that there should

be no monitors and locked doors on the front of the ACE system and no one should have the key. I couldn't find too many broadcasters that were of that opinion; André comes from the world of IT. For me, there is



Racks at the IPTV facility in Ames await the installation of ACE.

always some comfort in walking by the MC operation and seeing the program on the monitor. It keeps us focused on what we're supposed to be doing even when everything is going well.

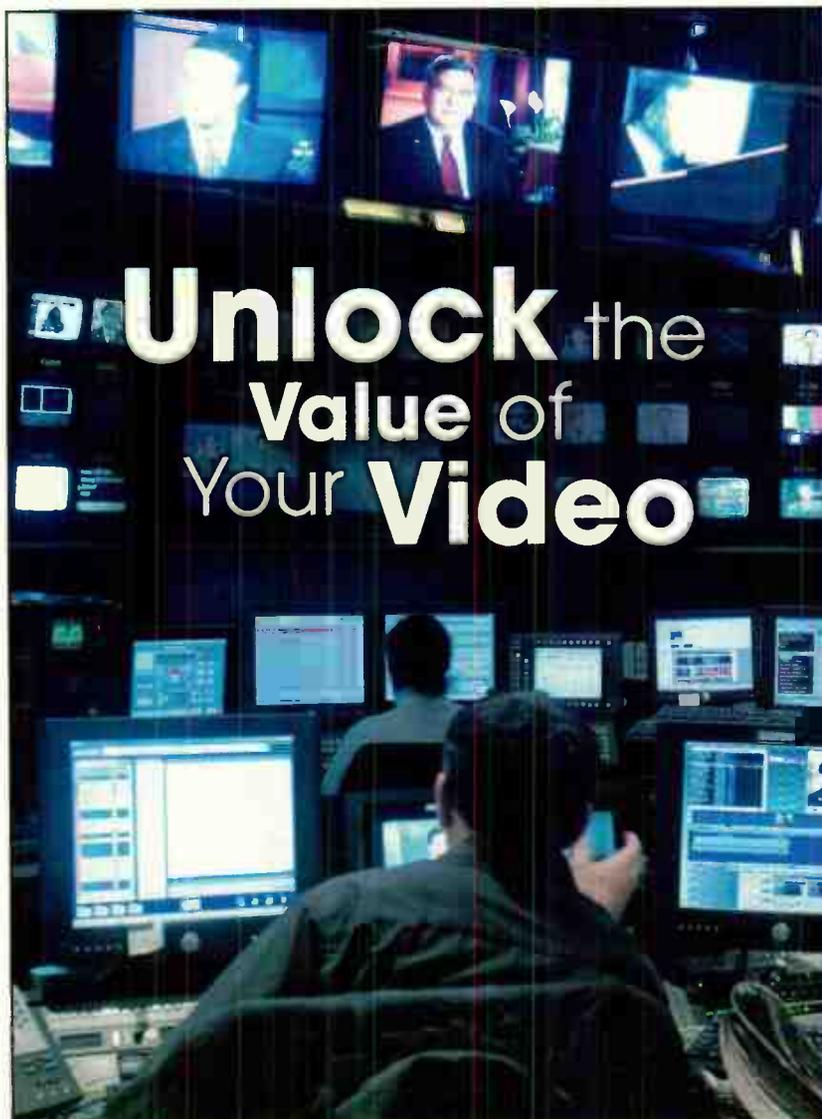
A few weeks ago we had a meeting with the IPTV staff members who will be taking on leadership roles on

the ACE implementation from the various departments. A number of them were asking questions and looking for detailed information so that when the system was installed it would be flawless from the start.

I don't think I scared them, but I did give them pause when I said that I did not expect that ACE would work out of the box. I also told them that we would spend some considerable time debugging and massaging the system to make it function. Expecting a flawless performance out of serial number one is not reasonable. What I expect is that the basic system will work but that we're going on a shake-down cruise and we'll find some leaks along the way. I don't have a problem with that as long as

the vendors and PBS are willing to step in and make the needed corrections. I look at this as a partnership and its success benefits us all. ■

Bill Hayes is the director of engineering for Iowa Public Television. He can be reached via TV Technology.



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ACE

CONTINUED FROM PAGE 20

processing the content will be created in ScheduALL, a facilities and human resource management package that allows us to use all our resources better. In time, these work orders will create invoices directly in our Oracle Financials ERP system.

Simultaneously, the proper folder and file structures will be created in our Avid environment and used later by the incoming program essence.

Depending on the original data entry, workflow steps will be created that control the program progress from the original ingest to the first broadcast.

These data elements are eventually matched with the program essence when it arrives at PBS. Initially, this process will still rely on content producers creating program master and backup tapes and sending them to PBS where they will be ingested directly into Avid Adrenaline workstations. During ingest, frame-accurate timings will be verified against the original metadata while the program is checked for any technical defects potentially introduced by the tape processes.

AUTOMATED PROCESS

Once a program is complete, contains all the necessary elements (closed captioning, descriptive video services, secondary languages), and is ready for air, we will immediately create and archive three copies encoded at different bit-rates:

The first copy will be archived in the IMX50 format and will be later used for post production, including the creation of promos, promo reels or the repackaging of the program with different content underwriters. This process will leverage the Dynamically Extensible Transfer interface between the Avid system and our MassTech asset management system.

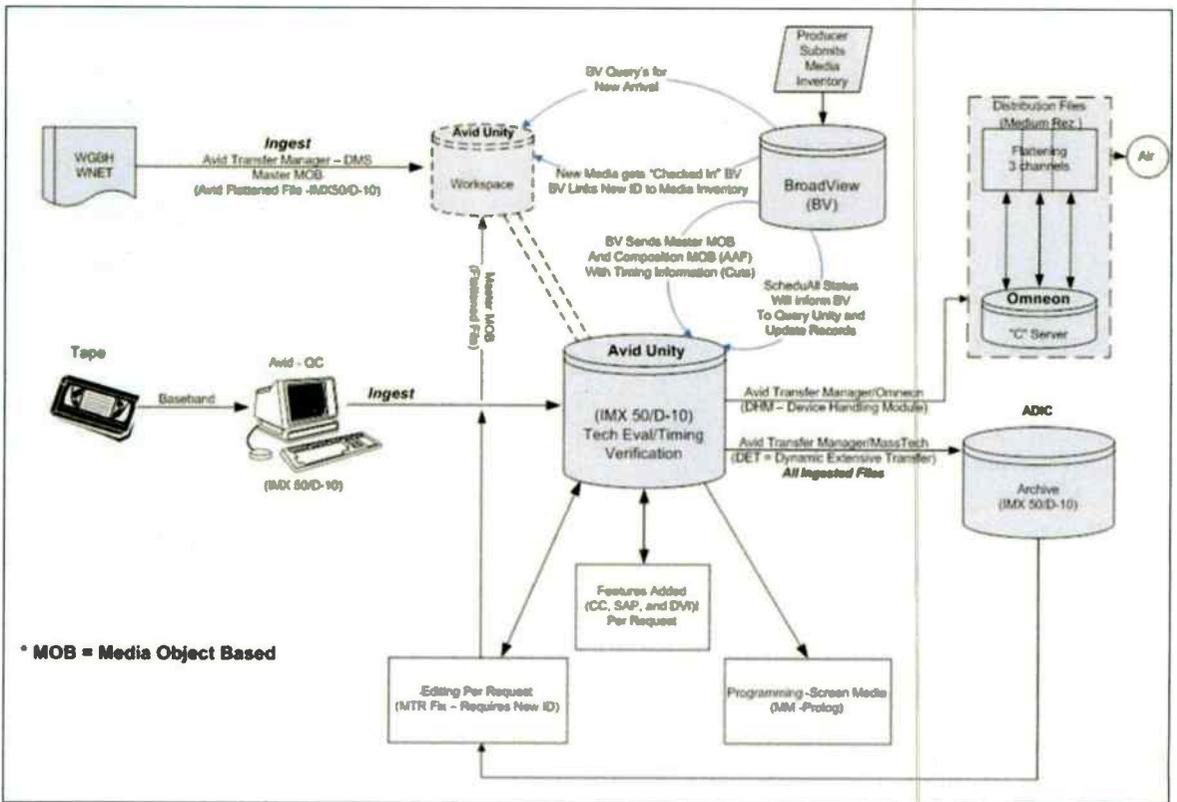
The second copy will leverage a Data Handling Module interface

between Avid and the Omneon servers to store an IMX50 file which, under complete automation control, will be turned around to produce an MPEG-2 distribution file encoded at about 12 Mb (eight for video and four for audio). These distribution-

language, profanity, graphic violence or any other content that might be deemed unsuitable for a general audience by current FCC regulations. These proxy files will be available on a screener's desktop and can be called up from the Broadview scheduling

continue to optimize the public television content supply chain.

I have no doubts that our new content ingest workflows represent the beginning of what will be a long and arduous but nevertheless rewarding journey.



A diagram of the ACE workflow

quality files will be permanently archived in storage for later rebroadcast. They will contain the necessary elements to be leveraged via real-time streaming or in the IP-based multicasting file delivery system that we will deploy as part of public television's Next Generation Interconnection System (NGIS). The NGIS will be covered in one of my next columns.

The third and final copy to be created by this automated process will be a 1.5 Mb low-resolution proxy that will enable our programming operations staff to screen the programs specifically to identify and flag coarse

and traffic system. Their availability enables additional verification of segment timing and immediate entry of any content-related flags into the program's database, obviating the VHS dub-based system and data reentry that we use today.

As they stand today, these metadata- and database-driven workflows will provide PBS and its member stations with a far more efficient and accurate processing of each and every program.

Eventually, we expect that the initial tape-based ingest will be replaced with Internet-based file transfers. After that, step-by-step, we will con-

Count on IT!
(I would be remiss if I didn't point out the tremendous cooperation that made the emergence of these workflows possible. Our operations folks led by Steve Scheel and Wendy Allen, our programming folks led by Sharon Drayton and Caryn Ginsberg and Michael Hunt as the overall project manager put in very long hours to create this substantial leap in processing efficiency.) ■

André V. Mendes is the Chief Technology Integration Officer for PBS, based in Alexandria, Va. He can be reached c/o TV Technology.

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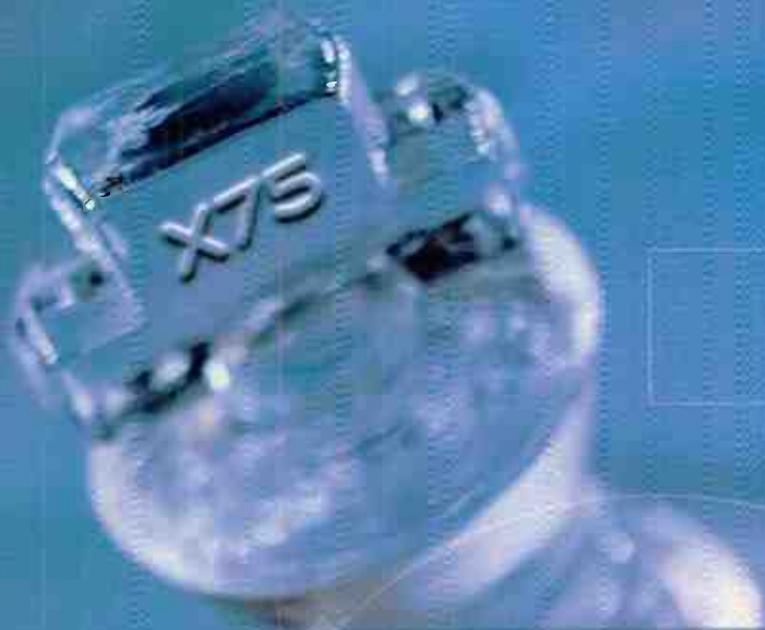
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FOCUS ON EDITING

Jay Ankeney

In Praise of Unsung Editors

When Thelma Schoonmaker picked up her richly deserved Academy Award for film editing at the Kodak Theatre in Hollywood, her name was properly among the permanent credits adorning Martin Scorsese's biopic, "The Aviator." But unless we see the film on DVD or in a theater, the version most of us will view on TV, on an airplane or in some other venue will have been altered by hands unseen and uncredited.

So this is a story about the most unsung editors working their magic at an innovative company called 2G Digital Post just outside of Los Angeles. It is also about a remarkable post-production entrepreneur who had the vision to rethink a process the stodgy old studios were making a hash of, and figure out a way to do it right.

The major function of 2G Digital Post is to repurpose previously released feature films to make them conform to the Stan-

dards and Practices requirements of broadcast networks and to the even more restrictive limitations of entertaining in-flight airline audiences.

As a case study, we'll focus on one of their most recent commissions, MGM's 2001 theatrical feature "Bandits," starring Bruce Willis, Billy Bob Thornton and Cate Blanchett, scheduled to air this summer on ABC. The story involves two charismatic bank robbers who wind up in an escapade with the bored wife of the manager of the bank they are intending to rob.

DIFFERENT STROKES

The comedy caper was originally cut by Stu Linder (Oscar nominee for "Rain Man" in 1988, Oscar winner for "Grand Prix" in 1967). MGM assigned editor Vinnie Laino to supervise the TV version of the film.

"In their primetime dramas, the networks can include more words and images some would consider objectionable than

"Bandits," however, presented some different challenges when Laino took it to 2G Digital Post, where one of its online editors, Hedio Lobo, had his choice of six Avid DS systems (four with Nitris acceleration) on which to post the project. "Every film is a different case," Lobo explained, "and we have our own tricks to get around language issues. Often, we just remove the middle part of a word,



Images courtesy of MGM

Editing a movie for TV can require anything from combing unused footage for alternate takes, to integrating and layering new voice tracks, to painting, rotoscoping and tracking elements to disguise unlicensed product placement—such as the beer label in this shot from MGM's "Bandits."

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in feature-film presentations," Laino began, "often because they want their re-cut version of full-length movies to be available for airing at any time of day. I am given a list of necessary notes by executives at ABC, and then it is my job to incorporate those changes while still making the film as enjoyable as possible."

Laino has to wrestle with three general concerns during the process: indecency, time constraints, and—somewhat surprisingly—product placement for each venue where the film will be shown. These can vary widely based on each network's standards. For example, when he was involved with preparing the whole "James Bond" cycle for ABC, the limits were more stringent than the versions he supervised for airing on CBS.

"In their opening title sequences, Bond films often feature images of silhouetted nudity," Laino said. "ABC asked our CG artist to tone down the anatomical details, but the S & P folks at CBS are more lenient, so we left the shots alone. CBS had no comment about it at all."

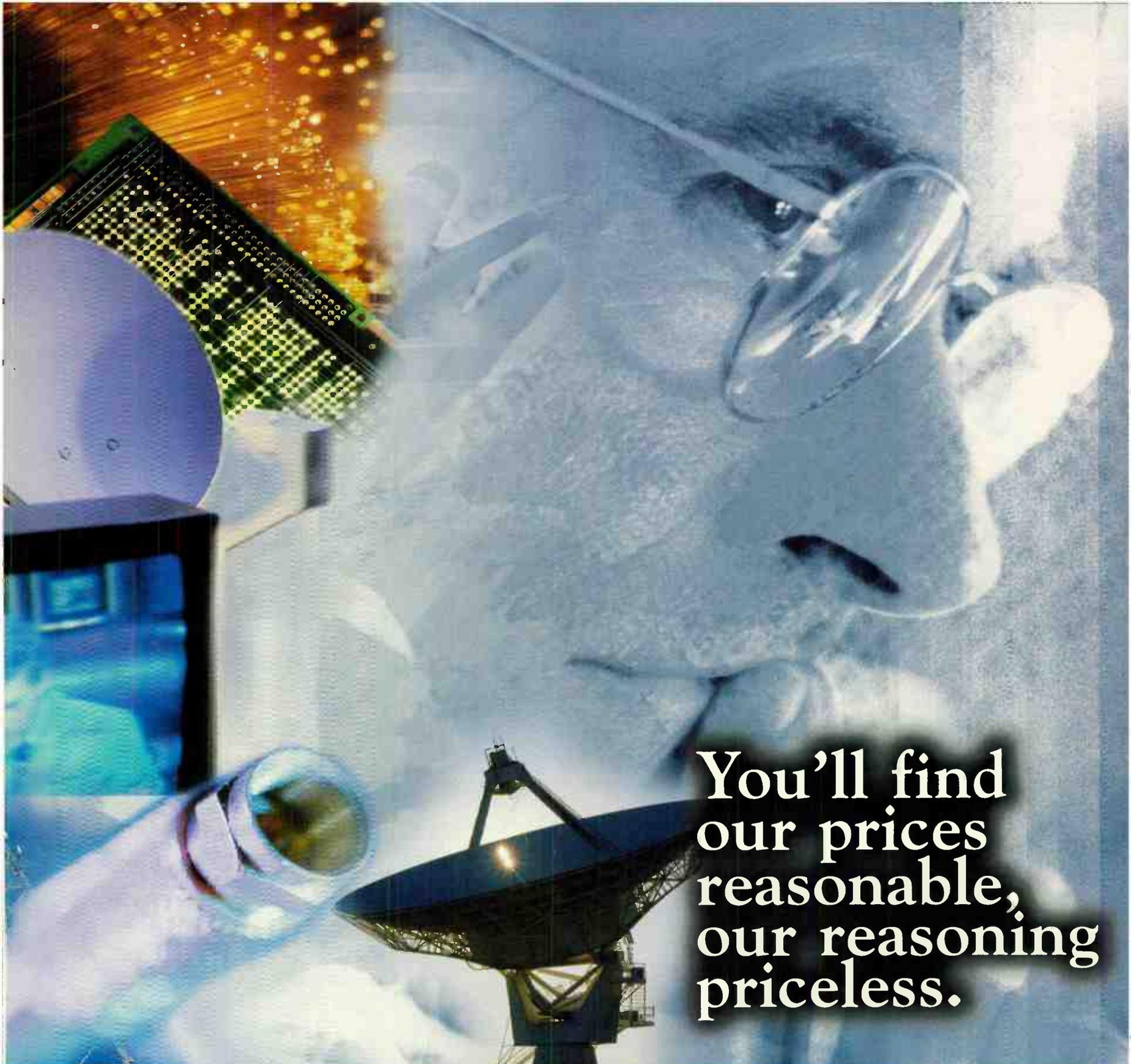
but for more conservative clients, we have to either cut the whole word or use the looped lines the actors recorded specifically for the TV version. Our DS Nitris systems provide plenty of power to handle both fixes for TV cut downs, and its multitrack audio capabilities come in especially handy when we are provided with discreet channels for music, effects and dialogue."

Airlines, by the way, have to be just as concerned about the images they leave in as the language they remove.

"I've been told to picture a room full of nuns," Lobo said. "Even if you replace the offensive words you still have to take into account that many passengers without headphones can be disturbed by lip-reading the looped dialogue. So you have to cut for picture and sound at the same time."

As it turns out, "Bandits" had a 120-minute running time, but ABC originally wanted to show it during a two-hour TV slot that allowed for just 88 minutes of

EDITORS, PAGE 28



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DIGITAL TV

Charles W. Rhodes

Compression and Cross-Modulation

This column has been dealing with DTV-DTV interference and has almost completed this discussion. Readers know, and I hope understand, that most DTV-DTV interference (the exceptions being co-channel and image frequency interference) is due to third-order nonlinearity.

In the case of adjacent-channel interference, nonlinearity in transmitters results in sideband splatter into both adjacent channels, and you know that this splatter is noise within the adjacent channel.

In taboo-channel interference and in adjacent-channel interference, nonlinearity—primarily in the tuner (mostly in the mixer)—results in generation of IM3 (third-order intermodulation) products. We have talked enough about IM3, but have we talked enough about two other IM3 products—compression and X-M (cross-modulation)?

Dr. Oded Bendov's 2004 IEEE Broadcast Symposium paper went into

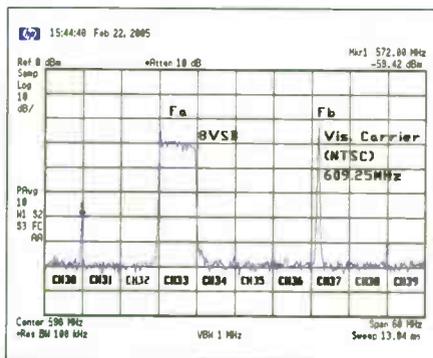


Fig. 1: Composite two-tone test signal

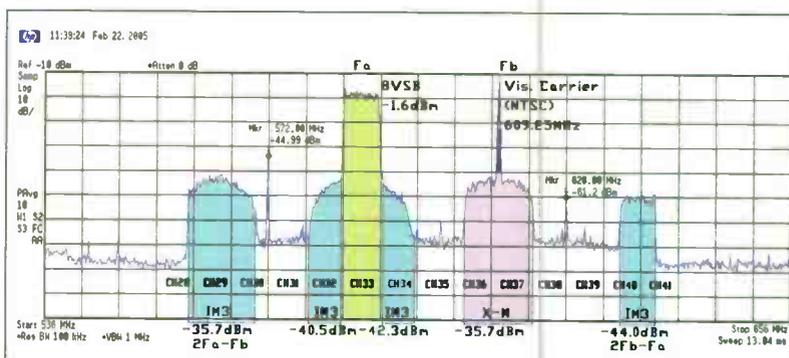


Fig. 2: Composite two-tone test signal with distortion

these aspects of third-order nonlinearity quite thoroughly. By the time you read this, the IEEE Transactions on Broadcasting will have published this paper, which is bound to become a classic. So, what did he report to IEEE last October?

LURKING UNDERNEATH

He showed that in addition to IM3 that falls in the adjacent channels, there is much more IM3 (call it noise) which

lies inside the channel, underneath the sidebands of the DTV signal. The IM3 within the DTV channel reduces the signal-to-noise ratio of the desired signal. His calculations show that the in-channel IM3 (which you can't see) is 9.8 dB above that which you can see in both adjacent channels; this will also be true of IM3 generated in the transmitter.

However, if the out-of-channel sideband splatter is 44.5 dB below the DTV

signal in-channel, then the in-channel splatter is 34.7 dB below the DTV signal, or a signal-to-noise ratio of 34.7 dB, which is excellent performance. Let's see why.

Given a signal power to a spectrum analyzer from the Tx (transmit) output, say at -30 dBm, the noise in the DTV signal is -64.7 dBm. If the signal

power at a receiver input is -80 dBm, the Tx noise within the DTV channel is -114.7 dBm, well below the receiver-generated noise (about -92 dBm) so noise from the Tx is inconsequential. That's the good news.

The bad news is that in addition to IM3 noise, there is also signal compression as another result of third-order nonlinearity in the Tx. Ah-ha, you say, but my Tx has adaptive pre-correction so there is no bad news for me.



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Ah-ha, I say, but just as third-order nonlinearity in the Tx causes signal compression, it also causes signal compression in overloaded tuners of receivers that have no adaptive pre-correction. Again, the culprit is usually the mixer. Why is it that the mixer always gets blamed for nonlinearity in receivers? A mixer is an inherently nonlinear device. It has a very useful second-order nonlinearity, which is why it can change the desired RF frequency to the IF frequency.

LOCAL OSCILLATOR LEVEL

But to do that without distorting the signal, the LO (local oscillator) power injected into the mixer must be well above the desired signal power at the mixer input. The LO power must be >10 dB above the desired signal power to avoid third-order distortion, which results in compression. LO power is expensive; the obvious cost is the need for a buffer amplifier if the LO cannot provide enough power.

In my RF test bed, I chose extremely linear mixers that require +17 dBm of

In case you missed this subtle point, differential gain is cross-modulation from the luminance to the chrominance channel of NTSC and PAL signals.

LO power. That took two stages of buffer amplifiers to get the LO power up to +17 dBm. Those buffers aren't cheap and I didn't have to pass FCC Part 15. The less obvious cost is due to FCC Part 15, which limits LO radiation by consumer electronic devices. I'm talking about the costs of shielding, filtering and decoupling, to say nothing of compliance testing.

The effect of signal compression is to reduce the highest power symbols, making them decode incorrectly. By attenuating the DTV signal, compression ceases, and DTV reception may resume. It usually doesn't take much attenuation; try one or two 6 dB attenuators.

So mixers are going to produce IM3 and compression and cross-modulation. At high RF levels near the transmitter, Dr. Bendov showed that X-M is about the same as the IM3 within the channel. X-M is the transfer of information from one channel to another. What happens is that the desired signal is amplitude modulated

by the undesired signal. In case you missed this subtle point, differential gain is cross-modulation from the luminance to the chrominance channel of NTSC and PAL signals.

AM has been around for a hundred years. A strong undesired AM radio station anywhere on the radio dial might be heard while listening to a weak station, especially during those pauses in the modulation of the desired

carrier. This led to the invention of special RF amplifier tubes around 1930 that didn't generate X-M.

I wanted to see X-M on a spectrum analyzer. This is not possible in the case of DTV-DTV, but it sure is for DTV into NTSC. This is because when the desired signal is DTV, the desired signal sidebands mask the smaller X-M sidebands. The best NTSC signal for this experiment has the least sidebands,

so I simply switched off the sidebands, leaving just the unmodulated visual carrier. I created a special version of a "U tone,"—an 8-VSB modulated DTV signal on Channel 33, which I call Fa in Fig. 1, and an unmodulated carrier at the visual carrier frequency of the desired Channel 37 (609.25 MHz), labeled Fb in Fig. 1.

COMPRESSION, PAGE 30



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Photo courtesy of Sony Corporation

ERG HD Monitors

Editors

CONTINUED FROM PAGE 24

program content. Lobo and Laino found that trying to cut 32 minutes from the movie resulted in an unintelligible plot. So Laino went back to the network and convinced them to give the presentation an extra hour. Now they needed to go back to the extra scenes included on the DVD release and actually expand the

overall running time. They rebuilt nine minutes of new material into the ABC version that was never seen in theaters. So if you were curious about what Bruce Willis and Billy Bob Thornton did in the bank manager's house the night before the robbery, you will have to see the network broadcast.

"When I tell friends what I do, they often look at me thinking 'Aha! You are the butcher'" Lobo said. "Instead, we go

to great lengths to produce as enjoyable a version that is possible. Out of respect for the filmmaker, we fight to retain his or her original intent. Believe me, we care."

CHANGING REALITY

One aspect of repurposing, product placement, is deeply entangled in the intricacies of Hollywood contracts. For myriad reasons, the logo on the can of coffee seen in the background of the the-

atrical version may not be contractually permitted on the TV screen. That's when 2G Digital Post calls upon all-round editor and graphics artist, Tony Cacciarelli, to use the Avid DS Nitris to change the reality of a scene.

"In 'Bandits,' a couple of guys are drinking beer, and we had to go in and change the brand name labels," Cacciarelli said. "Sometimes we just blurred them out, sometimes we wrapped a new generic label on the bottle. We also had to remove the trademarked name on a tote bag the bandits were carrying. Whoever keeps track of this stuff at the networks has an interesting job, but in the world of digital post we can change almost anything. We strive to fulfill what S & P wants, but not make the audience feel they have missed anything significant."

2G Digital Post is the premiere facility specializing in these repurposing services to clients such as Sony, DreamWorks SKG, Twentieth Century Fox and MGM among other studios, and that is exactly what its founder, Chuck Filliettaz, intended to create. After starting out cut-

"There is glory editing and there is meat-and-potatoes grunt editing."
—Chuck Filliettaz, 2G Digital Post

ting previews and wraparounds for Columbia-Tri Star Home Video, Filliettaz decided in 1993 to set up his own outside service to streamline the process. He introduced barcodes to keep track of the archived film and video elements, rented one-inch mastering time at local post house, and saved Columbia 40 percent in preparing their home video releases.

As nonlinear editing gained viability, Filliettaz adopted the Avid Symphony for standard-definition finishing and then the Avid DS Nitris systems for both HD and SD. 2G Digital Post moved from offices in Hollywood to an abandoned hangar near the Santa Monica airport, and this year into their new facilities in Culver City.

"There is glory editing and there is meat-and-potatoes grunt editing," Filliettaz said. "The latter is what we do at 2G Digital Post, and since not a lot of other people want to do it, the editing efficiencies we have introduced have made us a success. We may be unsung editors, but we keep our clients coming back." ■

Jay Ankeney is a freelance editor and post-production consultant based in Los Angeles. Write him at 220 39th St. (upper), Manhattan Beach, Calif. 90266 or at JayAnkeney@aol.com.

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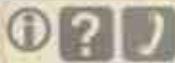
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Compression

CONTINUED FROM PAGE 27

Fig. 1 shows these two "tones" undistorted. Note that there is no IM3 clustered around the DTV signal, or around the NTSC visual carrier either. My RF test bed has a spurious signal denoted by the market symbol, which is of no consequence, but you might have been wondering what it is.

Fig. 2 shows the output of a solid-state amplifier overloaded by this special test signal. Surrounding the visual carrier frequency (Fb) is cross-modulation from Fa. How do I know that? Simple; I turned off Fb, and the X-M vanished, although the IM3 still surrounds the 8-VSB signal. You cannot cross-modulate what is not there! X-M also increases the noise hidden under your DTV signal.

Perhaps you have noticed in Fig. 2 a cluster of noise marked "2Fb-Fa" between 628.8 and 634.2 MHz. This is the IM3 generated by the interaction of the two elements of this special two-tone test signal. This is readily demonstrated by turning off Fb. It vanishes. You would have also noted the other cluster of noise marked 2Fa-Fb. This IM3 spectrum is 10.8 MHz wide because it is the difference between the

second harmonic of Fa and the fundamental of Fb. The spectrum of the X-M is double sideband amplitude modulation of Fb by the sidebands of Fa, which are at one-half the symbol rate of 8-VSB (5.38 MHz). It vanishes when Fb is switched off.

OVERLOADED RECEIVERS

What does it all mean? Well, X-M from a DTV signal would create snow on the screen of an NTSC receiver if the X-M were generated in its tuner by overloading it with a DTV signal on any channel near the NTSC channel. This is an excellent test for X-M in NTSC. If the snow gets worse with the signal attenuated, it isn't X-M.

The effect of signal compression is to reduce the highest power symbols, making them decode incorrectly.

So, what to do about DTV into NTSC interference? Simple—just attenuate the signals entering the receiver. Here is a situation where weakening the desired signal may remove snow. You might get complaints of snowy reception, perhaps from CATV system operators. Now you know what to suggest.

There is nothing special about the fact that Fig. 2 shows X-M from Channel 33. It could be from a DTV signal on any channel near the desired channel and this is quite unlike IM3, which can only result from two or more undesired signals on certain pairs of channels producing IM3 in a third and fourth channel. Fig. 2 may be worth keeping in your files as it shows both IM3 and X-M.

IM3 is just one of the three third-order distortion products, and is the easiest to see. When you see it, you know there are also the other IM3 products present—compression and cross-modulation. Dr. Bendov has worked out the relationship between these three artifacts of third-order distortion. As an industry, we cannot afford to have receivers being overloaded, generating IM3, compression and X-M.

Stay tuned. ■

Charlie Rhodes is a consultant in the field of television broadcast technologies and planning. He can be reached via e-mail at charleswrhodes@worldnet.att.net.

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AUDIO BY DESIGN Mary C. Gruszka

Resolving Pin-1 Problems

In my last column, I described how to test for pin-1 problems, using a test device dubbed "the Hummer," which injects a 60 Hz signal into the ground system of a device under test. An output is monitored and any increase in the noise level with the Hummer signal applied indicates a pin-1 problem.

Now what do you do when you find a pin-1 problem?

If you are evaluating equipment for purchase, then you may want to reconsider, especially if another piece of gear has similar features and no pin-1 problem. It will make system interconnection easier. If not, then at least you will know what you will be up against.

Brown reported that using this connector solved RF pin-1 problems with mics that were susceptible to RF interference.

Notify the equipment manufacturers of pin-1 problems. They may not be aware of them, but if they are, they may already have a fix, like modifications to the circuit board or other internal wiring.

Some people have made internal changes to reduce or eliminate the pin-1 problem without direction from a manufacturer, but there be warranty issues in doing this; most users will probably not want to go this route.

Barring fixing the equipment itself, take care in cable interconnection. Find a way to connect the shield of the signal cable to the equipment chassis instead of through the connector. This means breaking out the shield from the cable connector and finding a convenient place on the chassis, ideally near the mating connector, for a chassis connection. You may need to scrape paint and add a toothed washer beneath a screw to get a solid connection.

Remember that the goal is to keep any shield connection (and thus shield noise) from entering the chassis and connecting to the signal reference.

Microphones are special cases, as

they often need phantom power from an audio mixer or other device. For phantom power to work, the cable shield has to be connected to signal reference because that is the wire used for phantom-power return.

But microphones with active circuitry can present pin-1 problems, as Chicago-based consultant Jim Brown described in two AES presentations.

In these cases, something beyond a standard audio connector offers a solution. Neutrik is working on a special XLR connector that contains an annular capacitor to connect the cable shield wire to the connector shell. This provides a low-impedance path for RF to the shell, and subsequently to the equipment chassis when solidly connected to a proper mating receptacle.

(Brown found that very often, XLR connectors don't mate solidly enough with their receptacles for the shells to make good contact with each other. This is something to watch out for.)

The cable shield is also connected to pin-1 of this new type of XLR, but with a ferrite bead surrounding this lead to lower the Q of the capacitance-series inductance resonator. This provides the DC path to pin-1 needed for phantom power, keeping pin-1 isolated from the shell.

Brown reported that using this connector solved RF pin-1 problems with mics that were susceptible to RF interference. It certainly has applications for line-level signals as well.

PIN-1 RF INTERFERENCE

This brings up the point that pin-1 problems may not always manifest themselves at audio frequencies. If the shield is connected to the chassis by a small length of wire or trace, it may act as an antenna at RF frequencies, but not cause problems in the audio range. Also, pin-1 problems could cause the internal clock or other types of noise to be radiated outside the chassis and be a potential source of interference to other pieces of gear. This can easily snowball.

I've used analog-balanced interconnections for the examples presented here but pin-1 problems can lurk in unbalanced inputs and outputs, as well as in digital equipment.

Although induced noise may not be heard directly in digital equipment with pin-1 problems, that noise could be enough to prevent the digital signal from being received/decoded properly somewhere else in the signal chain. The cliff effect, where the signal sud-

PIN-1, PAGE 32

26x7.8AIF Tele Super Zoom



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26 x 7.8AIF.HR Tele Super Zoom
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"Our clients love the quality, and our operators have found the 26X Thales Angenieux lenses great for handheld camera work because they deliver the extra range we want for sports coverage while providing that extra degree of mobility," concluded Mr. Fain.

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Pin-1

CONTINUED FROM PAGE 31

denly disappears, can even be intermittent, depending on the nature of the induced noise—a troubleshooting headache.

What can an equipment manufacturer do to eliminate the pin-1 problem? Restructure the grounding scheme inside the gear, which is easier

said than done. Help is now available in the newly ratified "AES48-2005: AES Standard on Interconnections—Grounding and EMC Practices—Shields of Connectors in Audio Equipment Containing Active Circuitry."

Developed by the AES SC-05-05 Working Group on Grounding and EMC Practices chaired by Bruce C. Olson and vice-chaired by Jim Brown, this standard shows how to connect

designated shield contacts to the shielding enclosure (chassis) through the lowest possible impedance path.

It provides a diagram of a star-point connection to equipment ground (the ground prong of a three-prong AC power plug), the internal circuit reference and the chassis. The star-point approach provides a single point of reference. The standard also indicates a designated shield contact on the enclosure.

This scheme allows shield currents to flow through the chassis to shield connections in the cable and equipment ground, but not to the internal circuit reference. If this standard is followed correctly, there will be no pin-1 problem.

The standard also describes how to deal with unshielded connectors, connectors built into microphone cases and situations where the chassis doesn't provide a shielding enclosure (not encouraged).

Annex B to AES48-2005 includes examples of what not to do and why, and how to fix problems. These examples of the pin-1 problem, which do not meet the standard, are unfortunately very common today. Annex B could be used to help identify what mechanism is causing a pin-1 problem in a piece of equipment, should the user (and hopefully the manufacturer) wish to investigate further.

MORE AES STANDARDS

Having AES48-compliant equipment is the first step in creating a system that is free of hum, buzzes and RF interference. The AES SC-05-05 Working Group is continuing its efforts to standardize other pieces of the puzzle.

This work includes "AES-X027: Test Methods for Measuring Electromagnetic Interference Susceptibility in Balanced Line-Level Interconnections;" "AES-X125: Input Filtering for Electromagnetic Compatibility;" "AES-X147A: Connection of Cable Shields Within Connectors Attached to Balanced Audio Cables;" "AES-X147B: Shielding of Balanced Audio Wiring Within Passive Connector Panels and Passive Mic Splitters;" and "AES-X147C: Shields of Microphone Level Outputs of Active Equipment Other Than Microphones."

This all-volunteer group welcomes input from the industry.

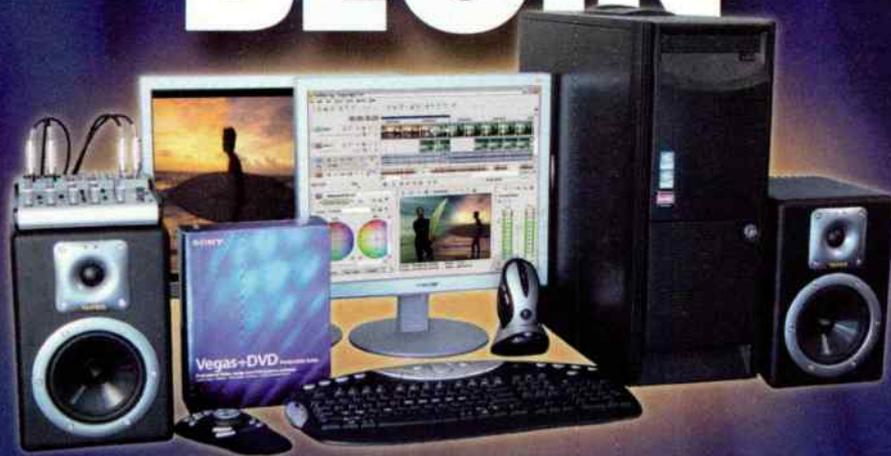
The first person that I heard refer to the pin-1 problem was consultant Neil Muncy, but I later was informed by Bruce Olson that Neutrik CEO Werner Bachmann coined the term.

There are many good references for further study available on the Web, including www.aes.org for copies of AES standards and reports; www.audiosystemsgroup.com; www.rane.com; www.jensentransformers.com for excellent white papers and applications notes; www.synaudcon.com for information about the workshop "Hum, Buzzes, and RF: Understanding, Designing, and Troubleshooting Real-World Audio and AV Systems," to be held in August in Chicago.

Next time you look for new equipment, ask the manufacturer, "Are you AES48-compliant?" ■

Mary C. Gruszka is a systems design engineer, project manager, consultant and writer based in the New York metro area. She can be reached via TV Technology.

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THE MASKED ENGINEER

Mario Orazio

High Definition Has Its Place—In Cameras

You might not have noticed that a meal of a cheeseburger, fries and a milkshake with a Cheerio is about as heart-healthy as one without. Yes, I'm making a plea here for everyone to shoot HDTV.

"But, Mario, what do hamburgers have to do with HDTV?"

Any child can tell you they both start with "H." But, on account of my using cheeseburger instead of hamburger, that ain't what I had in mind.

Cheerios, methinks, contain some identifiable amount of oat bran, and oat bran, methinks, has a Roto-Rooter effect on heart arteries. But I'd bet imaginary dollars to imaginary oat-bran donuts that the artery-clogging fats in that cheeseburger meal would overwhelm anything the Cheerio offers in the opposite direction.

That gets me to HDTV. Like just about everyone else who visits the NAB show, I've wandered into plenty of production trucks that have HDTV cameras. I've also visited quite a few outside of the really big show. That said, I've been in only one HDTV truck.

"But, Mario, you just said you've been in plenty!"

No. Kindly re-read. I said I've been in plenty of trucks that have HDTV cameras. They might be called HDTV trucks by their owners and users, but they've all got plenty of stuff that ain't HDTV.

The one and only truly HDTV truck I've been in was all HDTV, period. Every camera, lens, recorder, switcher and router was HD, of course. But so was every spigot, signal and monitor, including the little 3-inch ones the tape and video ops used just for identification.

The truck belonged to NHK, the Japan Broadcasting Corp. Where they got those 3-inch HDTV tube-based monitors I may never know, but that's the only HDTV truck I've ever been in that had them. In every other HDTV-related truck I've ever been in (including some more-recent NHK versions), the little tiny monitors ain't HDTV. That's fine, on account of no one being able to see HDTV on such a tiny screen anyhow.

Don't take my word for it. How about "Consumer Reports" magazine, the pub-

lication of the nonprofit Consumers Union, dedicated to guiding buyers through promotional hype? They do extensive product testing before reporting.

Here's what they had to say about HD versus ED (enhanced-definition, 480-line) plasma TVs in their March issue: "In our

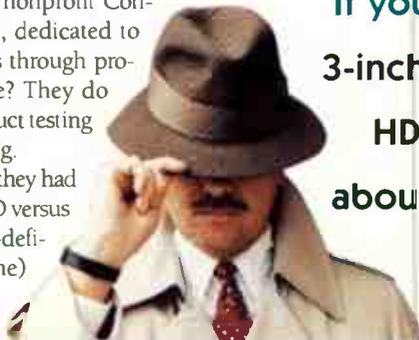
tests of 22 plasma TV models, the best ED set looked just as good with HD content as the HD sets. (One note: Sit closer than eight feet away from an ED set and you're likely to see individual pixels, making the image appear coarse)."

I don't know that I'd use those exact same figures, but I go along with their point. On even a 42-inch 16:9 screen viewed at normal viewing distances, normal viewers can't see more than ED resolution. Even up close, a 3-inch monitor would have a hard time getting HD into an eye. Maybe with a magnifying glass,

you could make out the detail.

That's the cheeseburger-and-Cheerio phenomenon. If your meal is an artery-clogging special, the trace amounts of oat bran ain't going to help. Likewise, if your monitor is 3-inches diagonally, HD resolution is about as useful as a Cheerio in a greaseburger.

If your monitor is 3-inches diagonally, HD resolution is about as useful as a Cheerio in a greaseburger.



That's resolution, the 1920 x 1080 that folks talk about when they talk about HD. But the "Consumer Reports" folks talked about "HD content" on those ED sets they measured. They didn't come right out and say it there, but HD content looks better on ED sets than ED content. Heck, it looks better on NTSC sets, too, even if it's being played back from some EP-mode analog VHS tape.

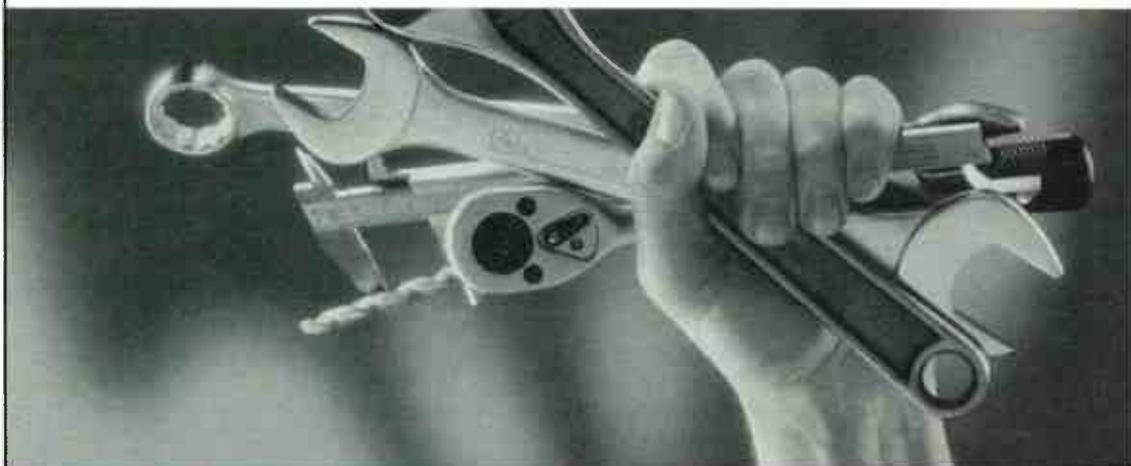
"But, Mario, if viewers can't see the difference between HD sets and ED sets, why does HD content look better?"

HDTV, PAGE 39

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PRODUCTION MANAGER

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Developing a Tapeless Workflow

I recently talked with a number of stations that are transitioning to tapeless video acquisition in their news departments. The removable hard drive, optical disc and memory card technologies these stations are moving to are very different. In each case, the change is monumental.

And each of these news operations is making a gradual transition—rolling out a few cameras, edit stations and peripheral equipment like edit vans. This seems eminently smart for several reasons. The first is that a newscast is mission-critical. Just ask anyone from the newsroom. (I kid around. News is mission-critical to a station.)

The other reason is that there isn't a lot of knowledge about tapeless workflow because it's new. If in spite of the best-laid plans, the edit workflow you establish isn't really very efficient. It's much easier to rip out just a couple of edit suites and start over.

THE EASY PART

The happiest people making this transition are those who are already editing with nonlinear equipment. They've figured out what's on the server and where it's located.

The folks at one station told me that going tapeless was the easy part; nonlinear editing was the challenge. You can write "Governor's Press Conference" on the label on a videotape cassette; when the material is in the server, however, there has to be enough indexing information for you to find it among all the bits and bytes.

All this leads up to a cardinal rule of mine that takes off from Newton's first law—a body in motion tends to remain in motion until acted upon by an outside force.

I think tapeless acquisition is going to be as huge a change in workflow as back in the day, when we went from 16mm film to videotape in news.

From that I have derived, the way something is done on the first day is the way it's likely going to be done for a long time.

And this fits with migrating to tapeless acquisition, because once you've established a good workflow, you're likely to keep it. Establish a bad one and it's my experience that it is tough to change.

Establishing a good workflow depends on a pair of factors—good planning and discipline.

I have a very logistically oriented mind. You can acquaint me with a process and I'll be able to tell you that this and this and this will happen next. That is, if I know enough about the tech-

nology. I'm not a "way-technological" person, so I have to rely on others for that.

PLAN YOUR WORK

All of this is a way of saying that if I were in charge of a changeover to tapeless acquisition, there would be a lot of meetings.

These don't always have to be in a conference room. You're not trying to implement a conference, you're trying to implement a workflow in a newsroom. Why not meet in the newsroom and walk through the process? (Joan Cusack might not have had to duck the file cabinet drawer in "Broadcast News" if they'd planned their workflow by meeting in the newsroom.)

There's another important factor to remember about tapeless acquisition media. It's not cheap. Where a DV tape is kind of a commodity, optical discs, removable hard drives and memory cards are expensive.

Every news operation I spoke with is instituting policies to check the media out to the photographer and log it through its path back to edit playback machines or ingest stations. Querying the pioneers on how they handled their media is really worth thinking through.

A great engineer I used to work with had a saying: "Plan your work, and work your plan." This is where discipline comes in—to carry out the plan you've cooked up.

Remember, early-on, where I said I thought phasing in tapeless acquisition

slowly was a good idea? One reason is that you can pair the people who are most likely to succeed with the new equipment first.

That's exactly what NY1 did when that news network migrated to the Panasonic P2 cameras. They use reporter/photographer one-man-band crews in the field, so when they rolled out the first set of P2 camcorders, they gave them to their most technologically savvy camera people. That way, they weren't adapting their system to those who had the least interest in shooting in the first place.

Another of the news operations I talked with had an engineer who was particularly interested in the tapeless acquisition project. He wanted to get it right from the beginning, because he knew the engineers would be responsible for fixing it later. It's too early to know if he's right about that, but I suspect he is.

I think tapeless acquisition is going to be as huge a change in workflow as back in the day, when we went from 16mm film to videotape in news.

With film, it took so long to thread the film-chain that the news department had to have almost all the news stories edited and spliced together in a long reel before the newscast started. Using tape allowed pieces to be edited just before being played to air—a huge workflow change.

Tapeless means nonlinear access to the media, possibly by several workstations, as soon as it enters the editing system. That should be a huge advantage to newscast producers, especially those who are serving several outlets at once.

But it's going to take some practice.

Craig Johnston is a Seattle-based Internet and multimedia producer with an extensive background in broadcast. He can be reached at craig@craigjohnston.com.

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EQUIPMENT REVIEW

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HD CAMCORDER

Sony HDR-FX1 HDV Camcorder

by Stephen Murphy

Though the HDV format is still finding its wings, the introduction late last year of Sony's long-awaited consumer HDR-FX1 camera and its prosumer HVR-Z1 cousin earlier this year has given the fledgling format the momentum to fly.

JVC got the HDV ball rolling more than a year ago with the introduction of its single 1/3-inch CCD 720p GR-HD1 consumer camera. Sony upped the ante and set newsrooms, forums and blogs on fire when its three-CCD 1080i HDR-FX1 started shipping.

FEATURES

The principal differences between the consumer HDR-FX1 and the prosumer HVR-Z1 (\$4,999) is that the Z1

has XLR audio inputs with independent level controls, is both PAL and NTSC compatible, supports DVCAM record and playback, has several more color, gamma and calibration options, and provides user-programmable timecode functions. From an optical acquisition and processing standpoint, the FX1, reviewed here, and the Z1 are functionally identical.

The 4.5-pound HDR-FX1 uses three 1/3-inch CCDs and 14-bit analog-to-digital conversion to create its 16:9 1,440 x 1,080i high-definition image. According to Sony, the camera's Hole Accumulation



The HDR-FX1 is the consumer version of Sony's HVR-Z1 HDV camcorder.

Diode (HAD) CCDs allow twice the amount of light to the imager, providing up to 6 dB improvement in its signal-to-noise ratio.

FAST FACTS

Application

EFP

Key Features

HDV-format, 1440 x 1080i HD camcorder; 16:9 native; permanently attached 12x zoom Carl Zeiss lens; 3-CCD sensor

Price

\$3,699

Contact

Sony Corp.
www.sony.com

The HDR-FX1 uses a proprietary real-time MPEG-2 encoder to fit its images onto standard 25 Mbps

SONY, PAGE 41

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Sony

CONTINUED FROM PAGE 40

MiniDV tapes or send them down a IEEE-1394 iLink pipeline. The camera records in high-definition or standard-definition modes and can perform real-time HD to SD down-conversion for live viewing on standard NTSC monitors. When shooting in SD, SP and LP tape speed modes are available.

The FX1's Carl Zeiss 12x4.5-54mm optical zoom lens yields a 35mm equivalent focal length range of 32.5mm to 390mm, and is equipped with 72mm filter threads. The aperture range runs from *f*1.6 to *f*2.8 and the shutter speed range is 1/4 to 1/10,000th of a second. Inside the large lens hood is a built-in barn-door style lens cover, which is engaged with a small lever.

The FX1 features auto and manual focus settings, as well as several exposure modes that include manual, full automatic, shutter priority and aperture priority. Dual non-continuous focus and zoom encoder rings encircling the large lens assembly emulate traditional (read: physical) manual adjustment rings.

Both the front-mounted 3.5-inch "SwivelScreen" LCD display and the rear-mounted, adjustable-angle viewfinder offer a 16:9 color image with more than 250,000 pixels. Flipping out the LCD display reveals the camera's VCR transport buttons plus volume, LCD brightness and backlight controls. Also on the same panel are display/battery info, data code, end search, color bars and zero reset buttons.

Arranged along the bottom left side of the camera are iris, gain, shutter speed and white balance adjust/enable buttons, as well as an overall auto/manual mode slider switch (auto/manual/hold).

Near the lens turret are controls for the built-in neutral density filter (ND1, ND2 and off), focus (auto, manual, infinity and a temporary "push auto"), white balance A/B and high/medium/low gain controls and the iris-adjust knob. There are also three programmable "assign" buttons and two programmable "shot transition" buttons (more on these later).

On the rear of the camera is a viewfinder zebra and peaking engage slider switch, picture profile and personal menu buttons (more later), a status check button and a dual function select and execute dial/pushbutton.

Connections on the HDR-FX1 include a 4-pin iLink (FireWire) I/O jack, an S-Video I/O jack, an 1/8-inch four-conductor mic/line input jack, a component output jack (works with the included breakout cable) and an

1/8-inch composite video plus stereo jack (cable included).

IN USE

The introduction of the Sony HDR-FX1 was no doubt a milestone event. In the same way that the introduction of digital multitracks such as the Alesis ADAT removed the financial/technical-quality barrier that clearly delineated home studios from

commercial studios for decades, the HDR-FX1 opens the door for many people to be able to produce source material at a quality nearing that of equipment that costs 10 times more.

(Note: I am in no way suggesting that simply having the ability to shoot at a very high quality equals a quality product—just that the potential to produce a quality product is now within the reach of many more people.

Much like the digital home studio vs. commercial studio analogy, much of what will be produced in HDV will simply be higher-quality renderings of poorly framed and lighted shots.)

From the moment I unpacked the HDR-FX1 review unit to when the time came that it had to be pried from my hands and returned to Sony, I spent every available minute putting

SONY, PAGE 45

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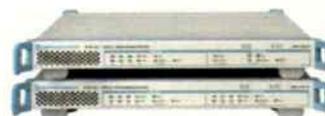
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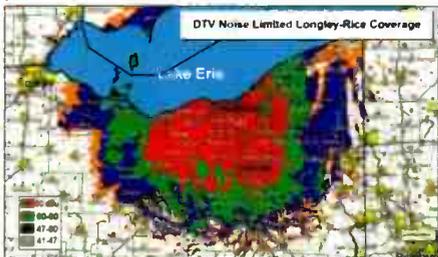


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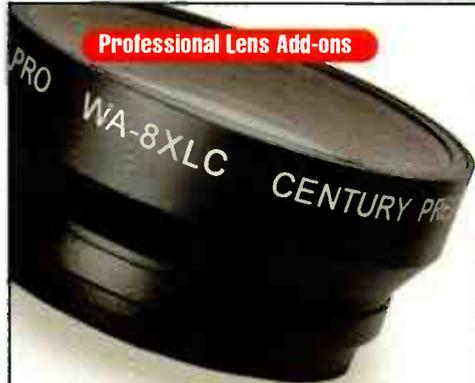
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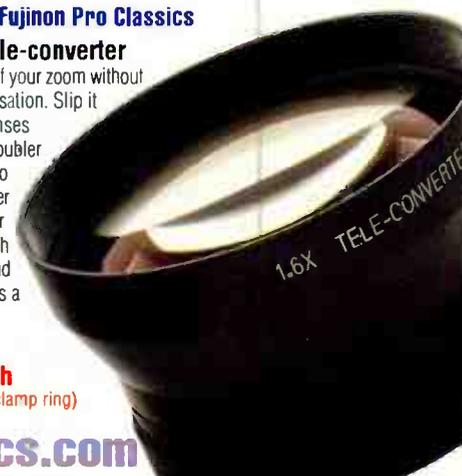
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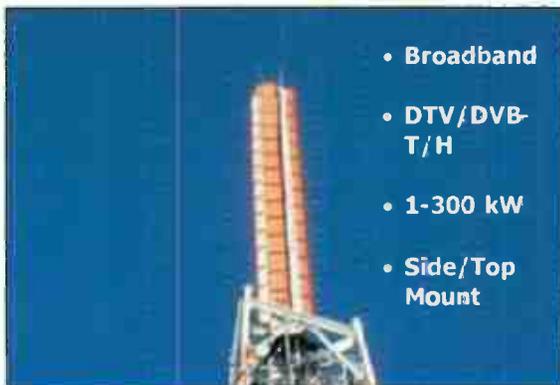
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CAMERA SUPPORT

Cartoni Tripod and Focus Pan/Tilt Head

by Bob Kovacs

The “nervous camera” look first struck my consciousness on the TV show “Hill Street Blues.” You know what I mean; the energetic camera never quite holds steady, giving you the impression that you are part of the scene.

This is now common in television production, so much so that novices sometimes think that a good tripod and pan/tilt head are no longer necessary for quality production. Although camera stabilizers and handheld shots are much more common than they used to be, there is always a place for a good tripod and pan/tilt head, such as the Cartoni T627/2 tripod and Focus pan/tilt head, in video production.

FEATURES

A tripod is the foundation of most camera support products. The Cartoni T627/2 tripod is a two-stage model made from aluminum tubes. A quick-acting tab release permits the extension of the tripod’s triple-tube stage and rubberized twist-lock rings hold the bottom telescoping section.

Broad rubber feet screw off to reveal pointed metal tips and the mid-level spreader can be adjusted to different lengths. Quick-disconnect tabs let you remove the spreader in a few seconds.

Fully extended and with the spreader set to its minimum distance, the tripod’s 100mm bowl is 60 inches above the level of the feet. Fully

spread, this distance is 56 inches and the tripod’s feet form a triangle that is 5 feet per side, which is quite a chunk of real estate.

FAST FACTS

Application

ENG and EFP

Key Features

Aluminum tripod with mid-level spreader; fluid pan/tilt head supports up to 22 pounds.

Price

\$1,795

Contact

Ste-Man
818-760-8240

www.cartoni.com

Collapsed, the tripod stands about 23 inches tall and two rubber fasteners hold everything neatly together when the tripod is collapsed; the Focus head adds another 5.5 inches to the system’s overall length. The Cartoni T627/2 tripod weighs 7.4 pounds and is rated to hold up to 110 pounds (50 kg), including the weight of the pan/tilt head.

The Focus pan/tilt head is solidly built of cast metal, with a 100mm ball mount, a quick-disconnect plate and the usual lock and drag adjustments. The head comes with a single arm that can be switched to either side, or you can order a second arm if you need two.

The quick-disconnect plate has both

1/4- and 3/8-inch camera screws and it can be slid forward and backward to improve balancing; in addition, there is a counterbalance control that dials in a



The Cartoni T627/2 tripod and Focus pan/tilt head can be set up and leveled quickly on most any terrain.

spring to assist in controlling the camera.

The base of the pan/tilt head has a bubble level with a light switch to allow the head to be leveled in the dark. The head can pan 360 degrees and its tilt range is ± 90 degrees. The Focus pan/tilt head weighs 4.4 pounds and is rated to hold up to 22 pounds (10 kg).

This Cartoni tripod and pan/tilt head system came in a sturdy Kata soft-sided carrying bag.

IN USE

The Cartoni T627/2 tripod is completely intuitive to set up and use. The upper section is extended using quick-tab levers that were simple to operate. The lowest section of the tripod uses common twist-lock rings to set the extension of the bottom tubes. All these adjustment knobs and levers are textured to be easy to grip with even the most slippery fingers.

The mid-level spreader worked perfectly for me with no coaching; it dropped into the right spot on its own and needed only a slight lift when it was time to collapse the tripod. The three arms of the spreader have quick disconnects to remove it from the tripod in seconds.

All the knobs, components and hardware on the T627/2 impressed me with their quality and engineering, and I was pleased with how quickly the tripod can be set up and broken down. In particular, the beautifully made rubber feet with their damped swiveling action were a thoughtful touch.

The Focus pan/tilt head also had an overbuilt quality to it, feeling well designed and purposeful. The controls were where I expected to find them

and operation was natural. The pan drag control is on a ring at the base of the head; this ring is deeply embossed with textured rubber that spells out “Fluid Drag.” The tilt drag and counterbalance controls are also rubber covered to improve grip in slippery situations.

On top of the Focus pan/tilt head is a quick-disconnect mount that operates with one hand, although it worked stiffly on the model I had. The release lever has a finger loop that, like so many other features on this pan/tilt head, makes it just about mistake proof. When I reattached the quick-disconnect mount, it snapped into place with a satisfying click.

I used the T627/2 and Focus pan/tilt head over a period of a few days for some test shots with both a video and still-image camera. I had no trouble setting up, operating and breaking down the system with cold fingers and it was simple to get it set up and properly leveled, including on uneven surfaces. The big knob for the ball mount made leveling the head a snap.

Extended to its maximum height, the T627/2 tripod did torque a little bit on fast pans but it was rock steady on slow-to-medium speed pans. The tripod’s rubber feet worked perfectly for me on all surfaces I tried (wood floor, carpet, sidewalk, pavement and gravel) and made a secure base. At all times, the operation of the Cartoni Focus pan/tilt head was smooth and predictable.

At nearly 12 pounds, the combination of the Cartoni T627/2 tripod and Focus head does have some heft. I’m not the biggest guy around and the idea of lugging these into the deep bush is somewhat daunting. However, Cartoni has a single-stage carbon-fiber version of this tripod called the T627c that is more than two pounds lighter—a significant difference.

SUMMARY

The Cartoni T627/2 tripod and Focus pan/tilt head really shine as a support system for EFP work. Since most camcorder/lens combinations weigh less than 12 pounds today (and some weigh much less), there’s plenty of capacity for the camera and lots of accessories. In addition, the Focus head seems overbuilt enough to support well more than 22 pounds and still work smoothly.

This Cartoni camera support system made an impression on me with its thoughtful touches, high-quality components and rock-solid construction. ■

Bob Kovacs is the technology editor for TV Technology.

Sony

CONTINUED FROM PAGE 41

the camera to the test; needless to say, I enjoyed the camera immensely.

While the HDR-FX1 does not equal the quality or flexibility of the more expensive professional HD cameras, the visual difference is far smaller than the \$20,000 to \$50,000 disparity would suggest. It is an exciting change in our industry, to say the least.

The camera, though lighter than it appears, was easy to keep steady and felt comfortable over extended periods of handheld use. The audio recording quality (at 48 kHz/16-bit MPEG-1 Layer 2) was fairly good, though the built-in mic, which did a nice job of picking up internal mechanics, is nothing to write home about.

I don't want to suggest that the audio was an afterthought, but it is no doubt overshadowed by the FX1's picture quality. Whether reviewing footage on the FX1's hi-res 16:9 LCD screen or on my studio's LCD HD monitor, the results were breathtaking, especially compared side-to-side with footage I shot with pro three-chip DV cameras costing three to four times as much. The quality of some of the nature footage I shot came very

close to that delivered over the Discovery HD channel.

Like the Z1, the FX1 includes some handy programmable functions and modes, though the Z1 has far more options in this regard. The three "Assign" buttons near the front of the FX1 allow the user to assign and quickly access three menu functions from a limited set of six: fader, steady shot, index save, audio dub, display and bars. Unfortunately, the available list includes two functions already found on dedicated buttons (display and bars), and does not provide access to several other essential functions only accessible several layers deep within the menu system.

Compensating in part for the above limitations is a good feature called "personal menu." Pressing the P-Menu button on the back of the camera brings up a programmable list of functions extracted from the full menu system. The list is limited to 28 items each for the FX1's camera and VCR modes. I did not count them all, but it appears that any item within the full menu system is available for inclusion in the personal menu.

Two other handy programmable features are the A/B shot transition function and the picture profiles. The shot transition function lets you create a smooth transition from one setup to another, with transition duration and

curve set within the menu. Transitions can include any or all of the following: focus, zoom, iris, gain, shutter speed and white balance. The picture profiles let you set up six pre-programmed picture quality settings (including color level and phase, sharpening, white balance and others), which can be accessed reasonably quickly by pressing the profiles button and scrolling to the appropriate memory location.

What to do with all that great HDV footage I just shot? For once it seems, the level of software support in place for a new format heavily outweighs acquisition methods: Sony, Adobe, Avid, Media 100, Pinnacle, Cineform, Canopus and Ulead already supported or announced imminent support for HDV by the time the camera arrived.

For this review I principally used Sony Vegas in combination with Cineform's Connect HD capture application and intermediate codec. Once the footage was transferred into my computer using a standard FireWire cable and interface, the raw MPEG-2 file was prepared into an AVI-wrapped file for easy editing within Vegas.

Though the HDR-FX1 does not support 24p (or any progressive modes), the camera does have several built-in film-like modes that work fairly well. For most of my shooting, however, I avoided these modes, pre-

ferring to use more flexible post-processing solutions such as VASST's HDV-ready Ultimate-S and Reel-Pak plug-ins for Vegas. By the way, VASST principal and Ultimate-S co-creator Douglas Spotted Eagle is the co-author of a very good HDV format primer called "HDV: What You Need to Know," available from VASST.

SUMMARY

Though I accumulated many pages of notes while using the HDR-FX1, unfortunately there just isn't room to cover all of the camera's features and applications here.

Suffice it to say that the FX1 is one product that is worth going out and trying for yourself. As expressed earlier, the ability to hold a professionally adorned "consumer" camera and shoot superb-looking HD footage is a breathtaking experience.

Whether planning a 16:9 HD doc or shooting for eventual cropping and downconversion to SD 4:3 for local broadcast, this inexpensive camera with excellent three-chip optics gives far more expensive cameras a healthy run for the money. ■

Stephen Murphy, a contributing editor to Pro Audio Review magazine, has more than 20 years experience in audio-visual production. His Web site is www.smurphco.com.





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CAMERA SUPPORT

Manfrotto Tripod and Pan/Tilt Head

by Stephen Murphy

Manfrotto's 519,351MVCFK tripod and pan/tilt head kit may not have the most exciting name ever assigned to a camera support product, but I promise that camera operators will be excited by the kit's rigidity, flexibility and light weight.

The 519,351MVCFK kit consists of the Manfrotto 351MVCF carbon-fiber lightweight video tripod, 519 pan/tilt head, 3189 mid-level spreader, 565 spiked foot shoes and the MBAG120P padded tripod bag.

FEATURES

The 351MVCF is a two-stage carbon fiber tripod with tandem upper legs and single telescoping legs for the second stage. The bowl interface is 75mm and the tripod height ranges from 27.9 inches (closed) to a maximum height of 58 inches. The tripod weighs in at 6.8 pounds and accommodates a load of 28.6 pounds.

The ends of the legs have twin metal spikes; slip-on rubber spike covers are provided, as is a set of

FAST FACTS

Application

ENG and EFP

Key Features

Lightweight carbon-fiber tripod; fluid pan/tilt head; mid-level spreader; accommodates cameras up to 19.8 pounds

Price

\$2,718

Contact

Bogen Imaging
201-818-9500
www.bogenimaging.us

padded spike shoes for use on slippery and/or easily damaged surfaces. An aluminum mid-level spreader is also included in the kit.

The Manfrotto 519 fluid head is the first pro video head to feature swappable and adjustable counterbalance



This Manfrotto tripod/pan-tilt head comes with a custom carrying case.

spings, allowing the 519 to accommodate a wide range of payloads. The 519 includes two interchangeable springs: a blue spring for cameras weighing from 3.3 to 11 pounds and a yellow spring for cameras weighing between 11 and 19.8 pounds.

The 75mm head weighs 6.4 pounds, stands 5.9 inches tall and includes a telescoping pan handle and built-in level bubble.

Like Manfrotto's other pro video fluid heads, the 519 uses a silicon liquid-filled cartridge system to facilitate pan and tilt movement. Large pan and tilt drag controls allow continuous adjustment across their ranges; movement is locked down using independent pan- and tilt-lock controls. The head is capable of a full 360 degrees of pan and +91.5 to -90 degrees of tilt.

The 519 head also features a quick-release sliding plate with 1/4- and 3/8-inch camera screws. A longer sliding plate offering a greater range of balancing options is available separately.

IN USE

Assembled, the whole kit weighed 16 pounds including padded tripod bag. I tested the Manfrotto kit with a Sony HDR-FX1 HDV camera and a Canon XL2 DV camera weighted down with varying loads of batteries, lights and audio interfaces.

Overall, I found the 519/351 combo to be quick to deploy, easy to balance and intuitive in operation. The tripod's carbon fiber construction proved to be resilient and rigid, even at its maximum extension settings. All the combo's adjustment knobs, dials and levers are sturdy, large and generally well-placed.

The 519 head features a hand grip-sized, rubber-coated column for tight-

ening or loosening the ball—a most welcome improvement over the typical (and frequently frustrating) wing nut or bolt. Thanks to this easy-to-access bowl-locking mechanism, leveling the 519 was a fast and comfortable process. The foam-gripped telescoping pan handle was substantial and sturdy.

When set to average heights, the tripod was extremely stable; when the telescoping sections of the single-leg stage are deployed, the pre-attached mid-level spreader came into play, providing additional stability.

The spreader can be quickly attached or detached via spring-loaded clips on the second stage legs and three knobs located towards the center of the spreader lock it into position. Because the aluminum spreader adds less than a pound to the overall weight, I preferred to leave it attached at all times.

I liked the fact that the 519's drag controls are continuously adjustable (as opposed to preset levels); the drag controls are graduated into sections and labeled one through seven.

The tilt drag control is a large dial on the left side of the head, with the tilt locking knob just above. While the large dial is nice, the tilt lock is just too close to really get a full grip on it. The pan drag control is a horizontally oriented thumb dial located at the base of the head. Both drag controls offered very good fine-tuning of settings, though there is some play in the dials before any settings changes take place.

Once the camera is balanced and the settings are dialed in, I could not have been more pleased with this head. Pan and tilt motions were smooth and fluid. When all was properly balanced, camera moves felt like an extension of my arm.

I should mention that the included MBAG120P padded tripod bag is one of the best I have seen. It is large enough to accommodate the entire tripod assembly and is very well constructed, with plenty of room for accessories in the internal pocket.

SUMMARY

At a street price of around \$1,700, the Manfrotto 519,351MVCFK tripod kit is a "best value" in my book. With its rigid carbon fiber construction, light weight and smooth, balanced movements, the 519/351 combo should be attractive to a wide range of video professionals especially given the fact that it this single tripod kit can accommodate cameras weighing from three to 20 pounds. ■

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CAMERA SUPPORT

Vinten Fibertec Tripod

by Carl Mrozek

Tripod design is not generally viewed as a hotbed of innovation in TV and film production technology. Quantum leaps in design and efficiency are generally well-spaced, but incremental improvements continue.

However, every so often a new technology such as carbon-fiber construction comes along, creates a buzz and improves life for those who use tripods to earn a living. The Fibertec tripod by Vinten may be such a development.

In addition to its carbon-fiber construction, the Fibertec tripod has a radically new design. Fibertec tripod legs consist of interlocking channel sections (vs. tubes) that overlap each other to achieve exceptional strength and stability. With Fibertec, Vinten's goal is to combine strength and stability with compactness and portability.

FEATURES

The Fibertec package I evaluated came with Vinten's Vision 100 fluid

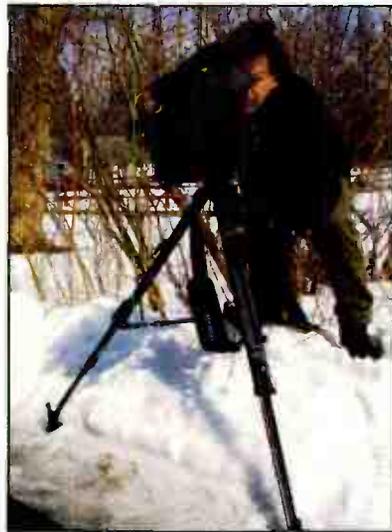


Photo: Kathy Beck

The author found the Vinten Fibertec resisted the effects of snow and slush.

head, which supports cameras weighing up to 44 pounds. The Fibertec tripod alone weighs 3.2 kg (7 pounds) and is capable of supporting 45 kg overall, roughly 100 pounds, more than double the maximum recommended load for a properly counter-balanced Vision 100 head.

Right out of the box, the most striking thing about the Fibertec tripod is its lean muscular appearance. Rather than the tubular skeletal design prevalent among carbon fiber and aluminum tripods, Fibertec legs feature open channel sections that slide neatly into each other when compressed. When extended, the interlocking stages overlap and reinforce each other like steel girders, forming legs that mimic steel in strength but not weight.

The entire length of channel overlap creates strength and rigidity. The more the legs are nested, the bigger the clamping area.

Also unique are the lever action clamps that lock the overlapping leg sections securely, laying flat against the leg when locked and dovetailing with each other when the legs are fully compressed. This reduces the likelihood of snagging cables and straps when handling the tripod; it also makes it more comfortable to carry by eliminating knobs and handles that can dig into skin, especially with the added weight of a mounted camera.

FAST FACTS

Application

ENG and EFP

Key Features

Lightweight; supports 100 pounds

Price

\$1,800 (w/o pan/tilt head)

Contact

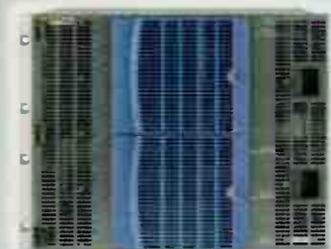
Vinten
845-268-0100
www.vinten.com

Fibertec is touted as being up to three times more rigid than its nearest competitor. This is especially helpful when using long lenses, when panning or tilting at high drag levels and when shooting in windy conditions.

The tripod has double-spiked feet that can be cushioned by optional rubberized foot pads.

VINTEN, PAGE 50

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CAMERA SUPPORT

Frezzi's Stable-Cam

by Carl Mrozek

The proliferation of small-format digital camcorders has spawned a new generation of camera support gear specifically targeting these welterweight cameras.

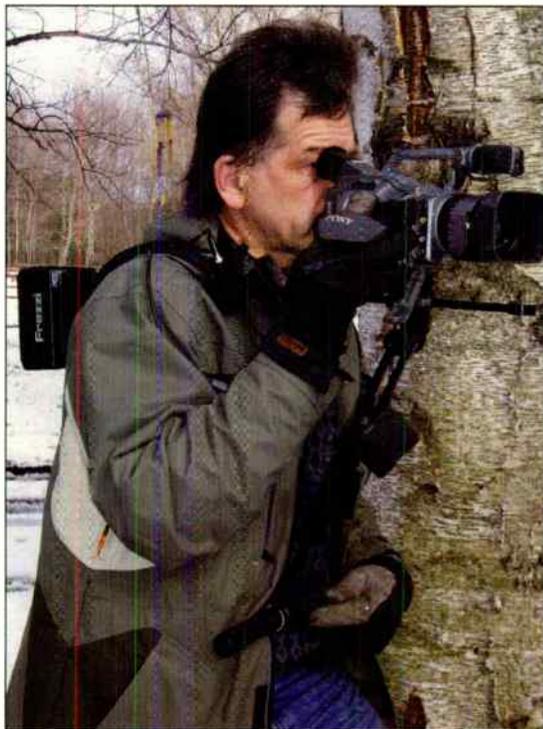
This includes an assortment of shoulder braces, stabilizers, body-mounted stabilizers and even small, high-quality tripods and pan/tilt heads. However, small cameras invite the sort of mobility you can't get with a tripod and this may be even more critical for the new generation of mini-HD camcorders.

Although the lens stabilizers incorporated into many small DV camcorders does help, the camera's slight mass makes it difficult to get smooth pans and tilts, let alone stable establishing shots without a well-designed camera brace. One such device, the Frezzi Stable-Cam, also doubles as a power station capable of supplying most 1/3-inch CCD camcorders and a small light for at least a couple hours.

FEATURES

The Frezzi Stable-Cam consists of 3/8-inch square rods made of airplane-grade aluminum. The vertical support has two stages, with the bottom shaft sliding neatly between a pair of parallel shafts, much like a tripod leg. A rubberized grip knob locks the shaft in place when a comfortable operating height is selected.

The quarter-sized knob can be locked down and loosened quickly to suit the situation, including the possible need to float the camera over the heads of a crowd during a media feeding frenzy. Part of the genius of Stable-Cam is that it uses gravity and a rubberized bike handle to provide support at the base without connecting to a belt of some sort.



The Frezzi Stable-Cam holds the camera, light and a full-size battery.

The horizontal shaft supports a generic camera-mount bracket with a tie-down bolt and the entire bracket slides about 12 inches fore and aft down the shaft. The angle of the horizontal and vertical supports can be adjusted precisely using knobs resembling miniature tires.

There is also a stabilizer bracket that mounts in the horizontal plane, perpendicular to the length of the horizontal shaft. It is controlled by a pair of handgrips and provides Stable-Cam with three-point balance and control. According to Frezzi, it also removes wrist stress and arm fatigue, and enables a more cinematic style of shooting.

One clear strength of Frezzi's Stable-Cam is its ability to deliver power from beefy broadcast batteries, enough

juice to operate the camera and a low-wattage portable light for an extended period. The key is stepping down the 14.4 Volts required by big broadcast cameras to 7.2 Volts, the input required by most small digital camcorders.

To power my Sony VX 1000 with the onboard battery, I needed a proprietary adaptor cable. This had to be specially fabricated, since the DC power tap on the VX1000 differs from that of more recent Sony camcorders like the PD150 and PD170.

The power cable threads into the power tap at the front of the shoulder brace on one end and plugs into the DC power port on the camcorder. There is also a fuse between the two plugs to protect the camcorder from potential overload by the 14.4V batteries. The battery bracket features a Frezzi-made Anton/Bauer mount, located at the base of the shoulder pad.

IN USE

I tested Frezzi's Stable-Cam using the Sony DCR-VX1000, an older DV camcorder with three 1/3-inch CCDs. The unit came with a compact one-battery charger and 45W Frezzi NiCad brick-type battery that snapped easily into the Anton/Bauer power bracket at the tail end of the shoulder pad.

I had no difficulty threading the 3/8-inch bolt into the camera-mount bracket and finding a sweet spot for it

FAST FACTS

Application

EFP

Key Features

Hands-free support for small-format camcorders; provides mount for large batteries and accessories

Price

\$495

Contact

Frezzi Energy Systems
800-345-1030
www.frezzi.com

along the two-inch track. As the VX1000 has no flip-out screen, I positioned the camcorder near the base of the horizontal support rail to take advantage of its eyepiece viewfinder. Although I made some minor lateral adjustments to the camera's position and angle, most of the time the camcorder bracket was locked down at the rear end of the horizontal shaft.

I used this setup to shoot some interviews, several of which were in tight quarters inside a rustic maple sugar shack where using a tripod would have limited my background options during the interviews. With Stable-Cam though, I had a broad selection of shots and was able to reverse my angle of view quickly and easily—literally with my back against the wall.

One of my first and strongest impressions of Stable-Cam was how comfortable and stable it felt even with the base of the vertical shaft merely resting on my hip instead of being fastened to a belt. With the vertical post attached to a pair of rubberized bicycle handles that grabbed the fabric of my pants,

FREZZI, PAGE 57

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Vinten

CONTINUED FROM PAGE 47

IN USE

One of my strongest first impressions of the Fibertec tripod was how light it felt, which made me skeptical about how well this new plasticine-looking product would perform under load in the field. The Vision 100 head has backlit drag knobs, an illuminated leveling bubble, a lubricated friction drag system and a balancing system with a digital readout.

Ergonomics aside, the Vision 100 can handle a hefty camera and easily supported my Sony DSR570WS DVCAM camcorder powered with IDX Endura 80- and 50-W mini-bricks piggybacked together. Besides using a Canon 18x9 pro lens, I sometimes added Canon's 0.8x wide-angle adapter or a Century Precision 1.6x tele-extender, each weighing more than 2 pounds. Other times I added Frezzi's 18-W HMI Sungun and an Azden 500 series wireless receiver.

At its heaviest, my camera package was on the high side of 25 pounds, slightly more than half the Vision 100's rated capacity and well below

the 99-pound capacity of the Fibertec tripod.

The Fibertec system that I tested also came with Vinten's new mid-level spreader that connects to the base of each upper channel. With spreader and legs fully extended, the Fibertec footprint measures more than 5 feet from toe to toe, forming an exceptionally stable base.

In practice, I never felt the need to fully extend the spreader for the sake of stability and only did so for fairly low angle shots. Otherwise, I had no trouble getting stable shots using the spreader, even when fully zoomed out with the 1.6x tele-extender added to the lens and the lens' internal 2x extender engaged. The overlapping channels provided exceptional rigidity and stability, even when the spreader was locked in a diagonal (vs. horizontal) position.

Equally impressive is the fact that the Fibertec system can be compressed into a very compact package for transport. The tripod and head contracts to fit neatly into a 30 x 6 x 6-inch padded canvas travel case that can be carried comfortably on the shoulder or carried like a guitar with a padded strap, obviating the need for wheels while traveling.

The Fibertec tripod itself can also be carried comfortably using the adjustable padded strap. I was able to carry the DSR570 camera package and the Fibertec tripod in the field, intermittently, for hours.

Once I found the sweet spot for the shoulder pad, I could walk briskly and even jog a bit with camera and tripod safely in tow. Moreover, I could lug it around for extended periods without developing a sore shoulder, as I did when shooting a St. Patrick's Day parade one long, icy Sunday afternoon. I even grabbed some steady handheld shots while wearing the tripod, using it as ballast.

I also found the Fibertec system easy to deploy from the shoulder, especially when carried in the upright, partially extended position. Even when the legs were almost fully extended, I could still carry the Fibertec on my shoulder hanging by its padded strap. To my surprise, I didn't develop a sore neck after moving camera and tripod around for a couple of hours in this manner, provided I found a comfortable balance point.

As important is the fact that comfort doesn't seem to come at the expense of performance. Strength, stability and rigidity all seem to have been maintained while providing a modicum of comfort for the tripod-toting cameraperson.

As with any gear, ergonomics are also important. With Fibertec, the side-by-side location of the lever-action leg clamps made deploying and adjusting the legs fast.

Something about the texture of Fibertec also makes it relatively quiet. This is critical when making mid-shot adjustments, when shooting wildlife and even when angling for candid, generic shots of people.

The ability to adjust upper and lower stages almost simultaneously and with just one finger is a definite plus and a tribute to Fibertec's smart design. This enabled me to keep one eye in the viewfinder and hold my shot while making tripod adjustments. When done shooting, all three legs can be quickly collapsed one or even two stages at a time by flipping open the locking levers, one or both stages at a time.

As we all know, no piece of gear is without its faults, no matter how well it's designed. In my view, one structural flaw of the Fibertec tripod is the modest ring used to fasten the shoulder strap. The ring provided is unfortunately the largest that can fit through the metal eyes on the tripod.

Although I didn't break any connecting rings, I took care not to tug them at the wrong angle, as I didn't trust their structural integrity. A bigger eye to accommodate a beefier ring to connect the shoulder strap would be a helpful improvement.

The biggest problem I encountered with the original Fibertec tripod, a prototype that I tested over two years ago, was a tendency of the leg channels to stick when wet and especially when cold. This impaired my ability to slide the leg stages up and down smoothly, sometimes even after attempting to dry and clean them with a cloth.

This was especially true when dirt or mud got on the tripod. As I often shoot outdoors in all kinds of weather, this happened regularly.

While I still reserve judgment, I am happy to report that I didn't encounter this problem in using the new and improved Fibertec tripod extensively for more than a month during the Northeastern winter. Much of that time I used it on snow, ice and slush, often while it was snowing or raining.

I also typically kept the Fibertec in the back of an SUV parked outdoors overnight when temperatures dipped well below freezing. Nevertheless, I experienced no sticking or lockup of the legs or clamps with the new Fibertec system.

I made only a casual effort to remove snow, slush and mud between uses, and was not scrupulous about it; ice and snow were often in the corners around the clamps at the start of a day's work. Fortunately, this didn't impair the Fibertec tripod's performance or my ability to adjust it quickly and easily, even with fresh snow covering it.

SUMMARY

Vinten's Fibertec tripod system is a new-age approach to tripod design. In some ways it may be to tripods what Kevlar has been to canoes or body armor—delivering better performance with less mass.

For those who shoot film and video for a living, this means that it is now easier and more affordable than ever to get the stability of a heavy tripod without its burdensome weight. The complete Vision 100/Fibertec field package weighs around 15 pounds, including strap and spreader and it replaces an older-style fluid head and tripod legs more than double this weight.

This is the first tripod I have carried over hill and dale together with camcorder and accoutrements, for hours at a stretch, without strain or even requiring an extra few hours of sleep at day's end to recuperate. This permits me to put more energy into the aesthetics of shooting—which translates into a better product at day's end. ■

Carl Mrozek operates Eagle Eye Media based in Buffalo, N.Y., specializing in wildlife and other outdoor subjects. His work appears regularly on the Discovery Channel, CBS, PBS and other networks. Contact him at eagleye@localnet.com.

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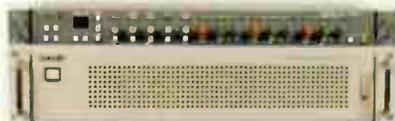
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Frezzi

CONTINUED FROM PAGE 49

the camcorder was quite stable and upright.

I was equally surprised at how easy it was to grab establishing shots when partially zoomed out and even close-ups of the sugar-making operation without switching to a tripod. Moreover, I was able to conduct interviews while holding the shot and could do slow push-ins and -outs, even during interviews.

On top of that, I managed to get some fairly useable wide tracking shots of the interviewees tromping through the snowy woods, from maple to maple, with the help of the two-handed stabilizer bar. The dual grips provided a strong handle on the camcorder and could compensate for bumps and jolts, especially while moving.

My biggest frustration with the Stable-Cam was the difficulty in adjusting the camera's horizontal plane, such as you might do with a tripod's level-

ing ball. My only recourse was to tilt left or right as needed. Another minor inconvenience was coping with the slack in the power cord without getting snarled up in it. This was an inevitable result of the camcorder being quite close to the power port most of the time; the power cord was long enough to work with the camera 12 inches forward of where I had it positioned.

Energy-wise, the ability to draw from a much bigger power reservoir enabled me to keep the VX1000 powered up between takes, letting me grab shots I would have otherwise missed. With a fully charged 45W Frezzi NiCad brick, I was able to power the VX1000 fulltime and Frezzi 18W HMI Sungun part-time for more than two hours.

Although this is slightly less than the maximum run time with an internal NiCad Sony battery, the addition of a muscular portable light normally creates a heavy draw.

Stable-Cam, with its onboard power system, solves both the stability and

power supply problems in one fell swoop, and is also a neat spot to hold the Frezzi MA-18 HMI Sungun.

Although it's difficult to quantify the gain in comfort and performance that comes from using a hands-free camera brace like Stable-Cam, the benefit is unmistakable. Among other things, it makes it possible and even convenient to perform other key functions like making phone calls, eating, drinking, scratching, using a restroom, all without removing the support rig.

This can boost efficiency greatly when shooting news, events and especially documentaries, where the great moments always seem to come when you are least prepared to capture them. With Stable-Cam, not only is your camera always poised and positioned to grab great shots on the fly, it can also be kept powered up and ready to shoot as quickly as eye and trigger finger can respond.

SUMMARY

For the most part, Frezzi's Stable-Cam delivers what I expected: a com-

fortable platform for handheld and hands-free shooting. It does it in a way that permits other essential activities without having to remove it.

Nevertheless, I also found it easy to remove, collapse and set down safely, whether on a table or in the backseat of a vehicle. One factor is the long locking lever for adjusting the angle of the shoulder pad. It both locks and unlocks securely yet quickly, and collapses the Stable-Cam into a tight, portable package. In addition, I found it a great, even if not perfectly safe way to get on-the-road shots—through the windshield—while motoring!

Stable-Cam's flexible camera-support features may be even more helpful as pro DV and now HDV camcorders become ever better and hence get used for a broader spectrum of events. This could be a handy piece of gear for those planning to use the new generation of HDV camcorders with 24p to shoot digital dramas, documentaries and even events like weddings—wherever mobility is paramount and stability is a necessity. ■

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TV TECH BUSINESS

Business News

EchoStar Profits Surge

LITTLETON, COLO.

A healthy boost in Dish Network subscribers during its latest fiscal quarter boosted revenues 28 percent for EchoStar Communications.

For the fourth fiscal quarter (ending Dec. 31, 2004), the satellite provider reported \$1.93 billion in total revenue, up from \$1.51 billion for the same period last year. EchoStar added 430,000 new Dish subscribers during the quarter, bringing its total subscriber count to 10.9 million.

EchoStar also reported \$7.15 billion in total revenue for the year, up from \$5.74 billion for the same period last year.

Net income was down for FY2004, \$215 million, compared to \$225 million for the previous year.

Expenses were up for the year, \$3.6 million, compared to \$2.7 million for last year. ■

Mobile TV Outfits Trucks with Leitch Gear

DENVER, COLO. & TORONTO

Mobile TV has purchased 18 Leitch X75HD up/down/cross converters and a frame synchronizers for its new truck, 10HDX.

The Denver-based mobile production services provider operates 10 mobile units nationwide, six of which are 53-foot expandos.

The 1RU X75HD operates in analog, digital or hybrid environments, converting up to seven input video formats—including HDTV optical fiber, HD-SDI, SDI, DV, composite video, Betacam and S-VHS/Hi-8—to most output video formats.

"It also cross-converts 720p/1080i, which means we can share camera feeds from other trucks regardless of format," said Phillip Garvin, general manager of Mobile TV. ■

Triveni Digital Equips ABC O&Os with StreamScope

NEW YORK & PRINCETON JUNCTION, N.J.

ABC is supplying its O&Os with the Triveni Digital StreamScope ATSC transport stream analyzer.

Engineers can remotely monitor multiple ATSC signals broadcast from the various stations and verify FCC compliance for the group of stations from a central location, using the StreamScope.

StreamScope ATSC stream analyzers monitor, measure and analyze DTV streams and signals in real-time, ensuring compliance with industry standards. StreamScope supports ASI, VSB, SMPTE 310, QAM and Gigabit Ethernet input.

The ABC O&Os currently use Princeton Junction, N.J.-based Triveni Digital's PSIP transmission system for market branding and for protecting channel identities on electronic program guides (EPGs). ■

Dielectric Appoints New President

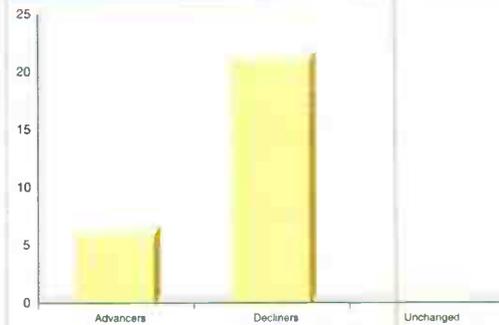
RAYMOND, MAINE

Dielectric Communications has named David J. Wilson as its president.

"David brings to Dielectric a strong operations and business development background, said Tom Riordan, executive vice president and chief operating officer of SPX Corp., the parent company of Dielectric. "The addition of David to the team will provide Dielectric with the leadership necessary to further improve processes and expand the business into new emerging markets."

Wilson holds a BSEE from the University of Massachusetts in addition to an MBA from Babson College. ■

WIN-LOSE RATIO



To have your company listed, contact Deborah McAdams at dmcadams@imaspub.com.

TOP ADVANCERS BROADCAST STOCKS (MARCH 4 - MARCH 18)

Emmis + 3.40%
Hearst Argyle + 1.27%

TOP DECLINERS BROADCAST STOCKS (MARCH 4 - MARCH 18)

Paxson - 60.47%
ACME - 19.10%

TOP ADVANCERS TV STOCKS (MARCH 4 - MARCH 18)

Pinnacle + 15.85%
Ciprico + 6.41%

TOP DECLINERS TV STOCKS (MARCH 4 - MARCH 18)

Harmonic - 15.96%
Tektronix - 10.65%

TV Tech STOCKS as of Mar. 18

Company Name	52-Week Range	Mar. 4	Mar. 18	% Change
Avid	40.90 - 68.35	65.75	62.95	-4.26%
Ciprico	3.15 - 7.21	3.9	4.15	6.41%
Harmonic	4.86 - 12.40	11.09	9.32	-15.96%
Harris	42.37 - 70	68.82	66.09	-3.97%
Leitch	6.53 - 11.2	7.7	8.17	6.10%
LSI Logic	4.01 - 9.94	6.38	6.02	-5.64%
Pinnacle	3.25 - 9.91	4.3	4.97	15.58%
Sci. Atlanta	24.61 - 36.50	30.26	28.18	-6.87%
SeaChange	11.22 - 19.75	13.6	12.57	-7.57%
Tektronix	26.26 - 35.00	28.55	25.51	-10.65%

Broadcast STOCKS as of Mar. 18

Company Name	52-Week Range	Mar. 4	Mar. 18	% Change
Acme	4.85 - 8.33	6.05	4.9	-19.01%
Belo	18.00 - 29.90	24.17	23.92	-1.03%
Emmis	17.08 - 25.63	19.1	19.75	3.40%
Entravision	6.85 - 9.61	8.96	8.37	-6.58%
Fisher	45.02 - 52.21	51.46	51.38	-0.16%
Gray	11.20 - 16.19	14.79	14.41	-2.57%
Hearst Argyle	22.57 - 27.93	25.27	25.59	1.27%
Nexstar	6.54 - 13.17	7.97	6.99	-12.30%
Lin TV	16.85 - 24.30	17.75	16.64	-6.25%
Paxson	0.48 - 4.02	1.29	0.51	-60.47%
Sinclair	6.12 - 14.20	8.08	7.73	-4.33%
Liberty	38.50 - 48	45	40.97	-8.96%
Univision	25.80 - 36.79	28.99	28	-3.41%
Young	7.43 - 18.58	9.11	7.81	-14.27%
Tribune	38.74 - 51.90	41.06	39.39	-4.07%
Meredith	45.68 - 55.94	47.78	47.15	-1.32%
EW Scripps	44.73 - 54.65	46.69	48.31	3.47%

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common audio
resources

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