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WHAT'S INSIDE

TiVo Enhances Interactive Ads

First partners to include The WB and GM

by Mark R. Smith

ALVISO, CALIF.

After years of criticism that its digital video recording service poses a serious threat to the advertising paradigm, DVR pioneer TiVo took the next step towards quelling those critics by announcing the launch of its next generation interactive advertising technology last month.

But more importantly, the rollout includes several major new partners: General Motors and The WB Television Network, as well as other recognizable brands including Ameriquest, E-Trade, Nautilus, Novartis and Tylenol.

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SPECIAL REPORT

Do ENG Crews Put Safety First?

Two years later, industry assesses impact of CAL-OSHA rules

by Craig Johnston

SEATTLE

For the amount of everyday work and road miles electronic newsgathering vans put in every day, they have been involved in relatively few accidents.

But as Doug McKay, national sales manager for Clearwater Fla.-based Frontline Communications said, "unfortunately, they were severe. When you do put the mast up into power lines, you pay a heavy price. People have limbs amputated. People die."

In response to these horrific, high-profile occurrences, approximately two and a half years ago, the California Occupational Safety and Health Standards Board (CAL-OSHA) established the first set of regulations establishing guidelines for ENG van construction and operation.

Among the CAL-OSHA guidelines specific to ENG are the use of switches that require constant pressure to raise the mast; level indicators to ensure that the vehicle is level; spotlights for operating the mast at night; audio and visual warning indicators to prevent moving the vehicle while the mast is raised; and extensive employee training about the hazards of electrical energy in relation to ENG vehicle operations.

TV Technology spoke with

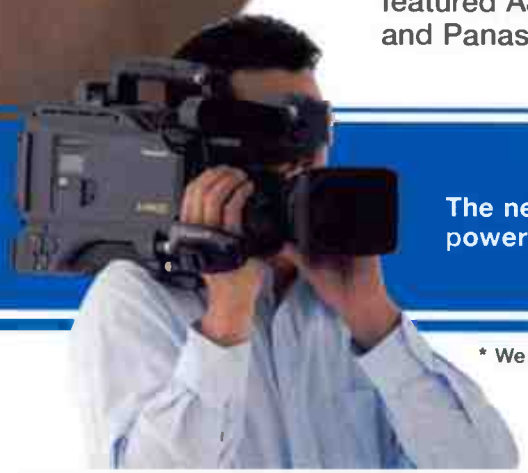
ENG SAFETY, PAGE 18

all the news fits

Shoot more news more efficiently with Panasonic's new P2 Store drive. The AJ-PCS060 stores 60GB of DVCPRO footage on a one-pound*, ultra-rugged hard drive that simplifies ENG workflow. Plug in a P2 card, push the Start button and your DVCPRO content transfers to the P2 Store at faster-than-real time.

Crews need fewer reusable P2 cards in the field since the P2 Store holds the contents of up to 15 (4GB) P2 cards. P2-compatible edit systems connect to the P2 Store's USB 2.0 port for instant access to content.

The P2 line-up also includes the new, low-power AJ-SPC700 (pictured below) and the fully featured AJ-SPX800 DVCPRO50/25 P2 camcorders. To learn more about the new AJ-PCS060 and Panasonic's entire P2 family, visit **www.panasonic.com/p2** or call 1-800-528-8601.



The new AJ-SPC700 DVCPRO50/25 P2 camcorder offers low power consumption and high cost efficiency for newsgathering.

Panasonic
ideas for life

* Weight of AJ-PCS060 is 1.4 pounds

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HDNet covers the Discovery launch

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Focus on Editing

They said it couldn't be done, but now that the long GOP recording format called HDV has found its way into the hands of real-world editors and production folk, it is starting to prove that a lot of the early skeptics were wrong... p. 24

Charles W. Rhodes

Digital TV

Recently, a reader wrote to me seeking a copy of a paper on measuring the transient peak-to-average power ratio of DTV signals. So perhaps the topic of DTV signal power, which is so different from analog TV signal power, is... p. 26

Mary C. Gruszka

Audio by Design

Back in my college days when PortaPaks were all the rage, one of the most helpful and practical resources I relied on was the "The Spaghetti City Video Manual: A Guide to Use, Repair and Maintenance," by the collective... p. 34

FROM THE MANAGING EDITOR

The Tides of July

During the weeklong production cycle of this magazine, six lives were lost under circumstances that thousands of ENG personnel are exposed to daily. Four Boy Scout leaders inadvertently raised a metal pole into a power line and were immediately electrocuted. A few days later, two Scout members died as a result of a lightning strike.

These tragedies remind us that life can end or be irrevocably altered in a split second. No story, no shot, no angle, no scoop—*nothing* in the ENG profession is worth being electrocuted.

Our esteemed colleague Mark Bell has been saying as much for years. Bell, who generously shared his expertise on Craig Johnston's Special Report ("Do ENG Crews Put Safety First?"), has been a relentless advocate for ENG safety. No one has devoted more time and energy to the message that lives are more significant than footage. Whatever pressures you may feel on the job; whatever fears you may have about losing it... such things are transient. Death is not. When raising or lowering a mast, *get out and look up every single time*. Don't assume you know what's overhead. A 20-second visual sweep can save your life. And remember, if you can hear thunder, you can be struck by lightning. If you're near the tallest thing on the landscape or you *are* the tallest thing on the landscape, or you're anywhere near a transformer farm, get thee to the vehicle and move to a safer area.

We were also reminded this week that space travel is not routine. In fact, with all the most advanced camera technology on the space shuttle Discovery, we are perhaps even more aware of the dangers crews are exposed to with each mission. This issue of TV Technology will hit the street after the scheduled landing of the Discovery, whose crew will be in our hearts and minds until they are safely reunited with their loved ones.

And finally, our thoughts turn to Bob Turner, who died July 15 of lung cancer in his home in Scituate, Mass. A video editor by profession, Bob was among a handful of trade journalists who helped set the standard for the professional video trade press. Our thoughts go out to his friends and family.

Deborah A. McAdams
Managing Editor
dmcadams@imaspub.com

LETTERS

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

Unintended Consequences

Greetings, esteemed Mario!

You may not have noticed... no, that's your line.

In your latest diatribe ("What About Tiny TVs?" July 20), you mentioned in passing that there are an awful lot of TV sets without analog tuners these days. What I have noticed is that there are hardly *any* TV sets with *any* tuners these days. In my part of Maryland, the big dogs are Circuit City and Best Buy. If you go to their Web sites, search for TVs, then sort by price, you go from cheap and analog to middling and up to "HD Ready!!!" with an occasional spice of an HD tuner on a surprisingly pricey smaller set (or, if you prefer, surprisingly small pricier set) and then up into the fiduciary stratosphere (why should my TV cost more than a new car?) where they *still* seldom have tuners.

This is a perfect example of the law of unintended consequences. You pointed out that the Commish decreed that TV sets would have digital over-the-air tuners by a date certain. If a TV set has to have a digital tuner, and a non-TV set doesn't, then I can sell TV sets that aren't TV sets and not worry about the tuners. The challenge is to get customers to go along with it, which they seem to be doing. Since I need a set-top box for cable or for dish, what's the big deal with needing one for broadcast? Except that broadcast TV is free to the viewer. So the unintended consequence of the Commish's action is the death of free TV. If shirt-pocket TV is lost at the same time, isn't that just collateral damage?

At this point, the only way to save broadcasting may be for the Commish to pass yet another decree, mandating that every set-top box provided to an end user for cable or dish also have a digital OTA receiver and detect at least local OTA signals without an external antenna. Another decree could require that cable and satellite, which are effectively monopolies and which brag that they have universal presence, be treated as common carriers and regulated like the utilities they have become, including not carrying any more non-digital channels as of the same date certain as broadcasters.

That still wouldn't save the shirt-pocket TV industry. It's more like whacking a hornet nest with a stick.

Other examples of unintended consequences that come to mind include:

- The war between Congress and the railroads that led to the creation of a long-haul trucking industry, followed by the death of railroad passenger traffic. In all fairness, Congress also subsidizing an airline system may have contributed to this one. Amtrak is still the whipping boy for Congress; why? The Europeans seem to think our transport system is pathetic, and I'm not sure they're wrong.
- The impossibility of U.S. kidnapping victims surviving. The Lindberg law made kidnapping punishable just like murder, so why not murder the kidnappee? Compare the Middle East and suchlike places, where kidnapping is rampant. The game has different rules, in which the victims only have value alive, and so are seldom killed. Granted, the whole subject is repulsive, but I don't think the outcome was anticipated.

How many more unintendeds can you think of?

David R. Bright
Washington, D.C.

Mario replies:

Ayup.

Here's one: Airport security checkpoints guarantee big crowds in unprotected zones.

Your pal,
Mario

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Telephone: (703) 998-7600
Editorial fax: (703) 820-3245
e-mail: tvtech@imaspub.com
Online: www.tvtechnology.com

The staff can be contacted at the phone extensions listed or via e-mail using first initial, last name @imaspub.com

Publisher: Eric Trabb 732-845-0004
Associate Publisher: Marlene Lane ext. 128

Editor: Tom Butt ext. 122
Managing Editor: Deborah D. McAdams ext. 177
Associate Editor/Buyers Guide: Lauren Evoy Davis ext. 149

News Correspondents: Susan Ashworth, Robin Berger, Mary Gruszka, Craig Johnston, Claudia Kienzle, John Merli and Sanjay Talwani

Production Director: Davis White ext. 132
Publication Coordinator: Carolina Schierholz ext. 125
Ad Traffic Manager: Lori Behr ext. 134
Classifieds/Product Showcase Coordinator: Linda Sultan ext. 109

Ad Coordinator: Caroline Freeland ext. 153
Circulation Manager: Kwentin Keenan ext. 108

President: Stevan B. Dana ext. 110
CEO: Carmel King ext. 157
Chief Financial Officer: Chuck Inderrieden ext. 165

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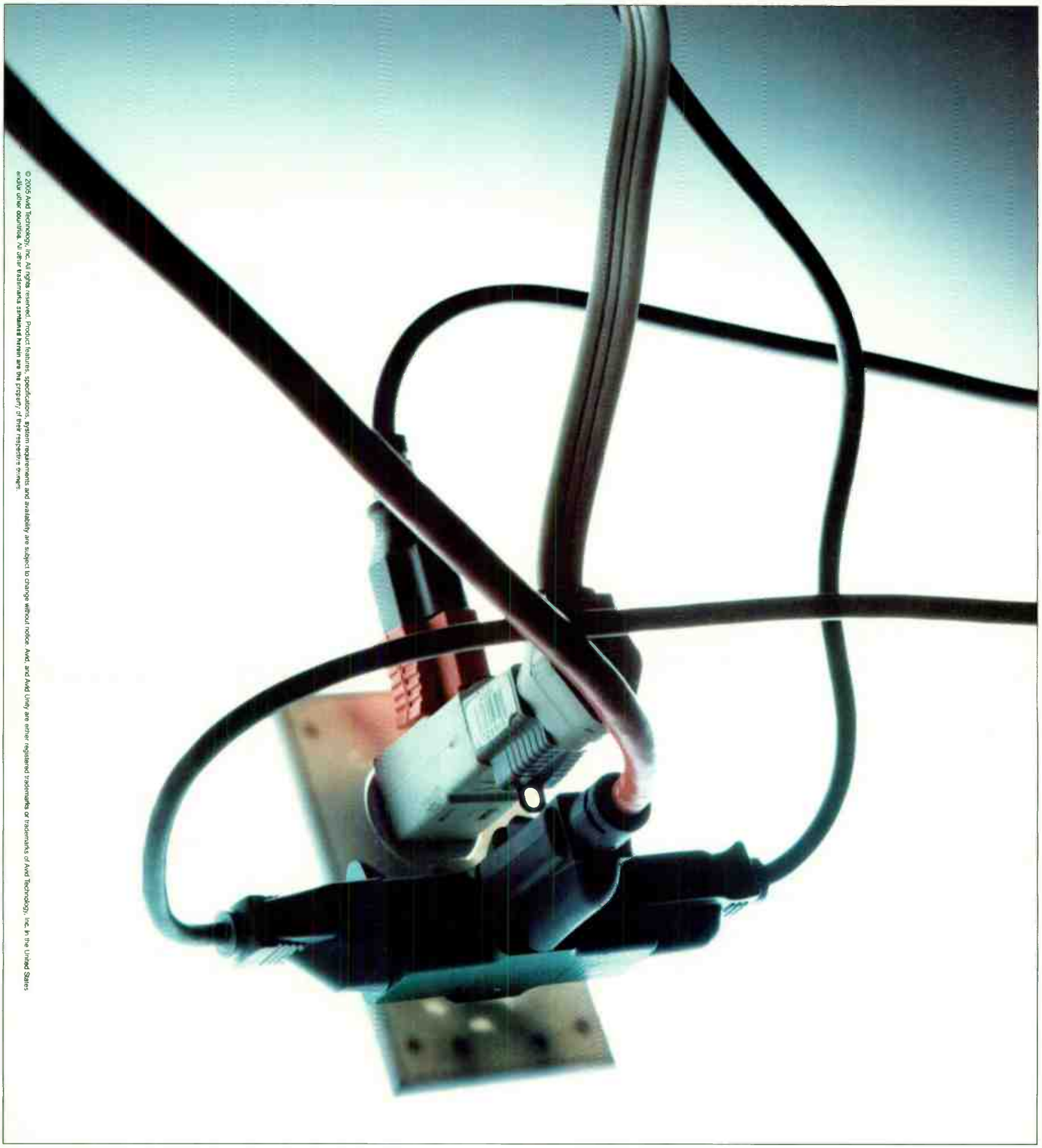

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ATSC Adds AC-3 Enhancements

WASHINGTON

The Advanced Television Systems Committee has revised the AC-3 digital audio standard, adding enhancements that will provide improved performance and flexibility. Enhanced AC-3 offers new coding tools and features that allow operation over a wider range of bit-rates and a greater number of channels. E-AC-3 also can be converted into AC-3 for playback compatibility on existing consumer A/V decoders.

"Enhanced AC-3 provides the industry with expanded audio capabilities that can be used for broadcast, cable, satellite, DVD and other applications," said ATSC President Mark Richer.

ATSC first standardized the AC-3 digital audio system in November 1994. Dolby Laboratories submitted enhanced AC-3 to the ATSC in response to a Request for Information published in December 2002.

The new E-AC-3 Standard (A52B) and other ATSC standards and recommended practices are available at www.atsc.org/standards.html.

Standards

Court TV, ViseonMedia Partner for VoIP

NEW YORK, DELRAY BEACH, FLA.

Court TV has teamed up with ViseonMedia to provide video to specialized phones via Voice over Internet Protocol.

The pilot program, involving VisiFone Multimedia digital home phones, is scheduled for early 2006.

The new VisiFone digital telephone, co-developed with Texas Instruments and Vonage will be able to display interactive video and digital audio. The new VisiFone will be available at Vonage.com and at Vonage retail locations, as well as through other carriers later in 2005, according to ViseonMedia.

Court TV will make video-on-demand clips of news and updates of the nation's biggest trials available to VisiFone pilot subscribers.

Court TV joins other content providers including The Weather Channel Interactive, Discovery Networks, Fox News, AccuWeather and others soon to be announced.

IPTV

Belo to Build Digital Production Center

NEW ORLEANS

Belo Corp. is consolidating station operations currently housed in the French Quarter by building a broadcast production center for CBS affiliate WWL-TV. The facility will also support UPN affiliate WUPL-TV, which Belo has announced it will acquire.

The new 61,000-square-foot, three-story broadcast center, located at 700 Loyola Avenue in the Central Business District and approximately 1.5 miles from WWL's current location at 1024 N. Rampart Street, will provide full digital production and HDTV broadcast capabilities. The facility will include a multi-use news production studio, a digital edit suite, integrated Web access for news feeds, production stations for the interactive media team and administrative offices.

The facility will be named the J. Michael Early Broadcast Center, who served as WWL's president for 37 years. Belo is working with The Beck Group to plan and develop the project. The center should be ready for occupancy by early 2007.

Production

TiVo

CONTINUED FROM PAGE 1

The new features build on the existing TiVo technology and integrate client feedback received during the past three years. These features enable advertisers to insert a customized call to action, or branded tag, in their commercial, replacing the generic ad tags previously used by TiVo's advertising clients.

They also ensure that advertisers' traditional TV spots will be more visible in TiVo homes, whether viewed in normal play or fast forward mode; and enhance the customer's experience by allowing them to select the tag and "telescope" from the traditional 30-second ad while pausing their program to view long-form content, make requests for information or take advantage of recording opportunities to enhance the viewing experience.

The new proprietary advertising technology also gives advertisers the ability to receive leads directly from their TV spots, so they can track leads to conversion and ensure a qualified return on investment; and supply additional data for advertisers to gain a better understanding of the effectiveness of TiVo's proprietary tagging feature, the strength of their creative, and the efficacy of their television media buying strategy.

The branded tag is embedded in line 21 of the Vertical Blanking Interval and works in a similar mode as closed captioning. It is triggered by the TiVo box and will only appear when TiVo pushes the campaign live.

"We have been developing the software during the past year," said Davina Kent, director of ad and research sales for TiVo. "It is not a new technology, but the enhancement is branded and intended to intrigue the viewer to click on the icon and learn more" from a 30-second spot or longer form content of anywhere from four to 12 minutes that can contain multiple clips.

"It creates a stronger call to action for the advertiser," she said.

When advertisers send their spots to the network as they usually would, a branded icon will show up on the screen in TiVo homes. The viewer can then request more info, because TiVo has their subscriber information. But that only occurs when the viewer opts in to release their mailing address or other personal information.

"It's an opportunity for the advertiser to offer information as they normally would, as well as move the viewer more quickly through the sales cycle," Kent said, "and the information is trackable, so TiVo can relay various anonymous aggregate data and the advertiser can see what clip the viewer watched and where the icons are effective."

It also offers the advertiser a way to see what ads work on certain networks and in certain markets, for instance.

BIG BREAK

"What we really want to get across is that we can feature ads that benefit the consumer and advertiser," Kent said, "and we are continually innovating our offerings to both parties and trying to stay in the lead, as far as technology goes, for those advertising and consumer segments."

The new technology was deemed "The true rollout" of TiVo by Richard Doherty, research director for the Envisioneering Group, a technical assessment and market research firm in Seaford, N.Y. "To put it in perspective, this is a new service enablement. Years ago, TiVo said this capability was coming and now they have a couple of service partners."

While TiVo has reported on results during major events like the Super Bowl—the company was able to say how many people reviewed the Janet Jackson "wardrobe malfunction" incident in the aggregate (but not per market), for instance—"this is the first time that there has been any interactive device in the household that can give more info when requested," Doherty said.

"This is a great breakthrough, because when you just bought a car, you don't want to look at a car ad," he said. "But if you do, you want more information and can take advantage of the offer. Overall, this is much better than just being shouted at for 30 seconds, regardless of interest in the product or spot."

WIDER MARKET

Other approaches are being used as this new technology enters the mainstream, Doherty said, noting that Scientific-Atlanta is promoting a similar option.

That point was echoed by Bruce Leichtman, president of Leichtman Research Group in Durham, N.H. "The new upgrade likely goes beyond the TiVo standalone box, because part of their new deal with Comcast calls for further development of the new technology," he said.

While TiVo is looking for opportunities to extend their reach, "The entire market for DVRs is not TiVo," Leichtman said. "If you include their TiVo DirecTV product, they have about 40 percent of the market."

He also offered this cautionary point: "As much as DVRs are doing very well and are in about 8 percent of American households, we should not assume that they are destroying the existing ad model," Leichtman said. "While 88 percent of DVR owners said that they skip advertising, 56 percent of those respondents also said that they were doing that before they had DVRs in their homes." ■

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A THOMSON BRAND

Calling It As They See It

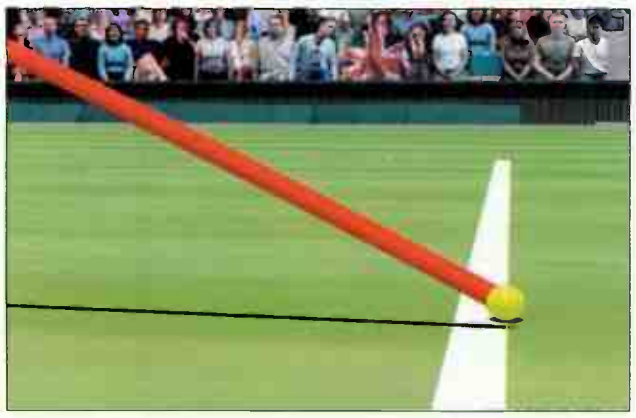
USTA decides on electronic officiating for the US Open

by Robin Berger

FLUSHING MEADOW, N.Y.

Next month's US Open, and the US Open Series of tournaments leading up to the main event, promise some firsts for broadcasting pro tennis.

NBC/USA Networks and ESPN are slated to debut high-definition formats in the series. ESPN has booked Game Creek Video's Patriot for the Pilot Pen Tennis tournament in New Haven, Conn. on Aug. 22, and NBC used NEP Broadcasting's Supershooter (SS24) for the RCA Championships in Indianapolis on July 23.



In or out—could a new and improved Hawk-Eye system help USTA officials better determine contested calls?

USA Networks' HD broadcasts of US Open matches on the two main TV courts in Flushing Meadow—Ashe and Armstrong stadiums—are slated for the newly renamed Universal High Definition Channel, formerly Bravo HD. The network will share truck equipment with CBS, which has contracted with New Century Productions (NCP) for the primary truck and NEP for the studio and support truck on the two main courts, according to Ken Aagaard, senior vice president of operations and production services for CBS Sports; the network will use trucks from Game Creek and Cross Creek for the outer courts. CBS has provided high-definition coverage of the event since 2000.

CBS will use an electronic video server-based system featuring the EVS IP Director as a "logging and metadata tool," Aagaard said. The setup will include 15 IP stations, five for logging dedicated feeds from each of the five courts and 10 for browsing stations, according to Greg Macchia, general manager of operations for EVS.

There's also word that Tech Imaging, a Boston-based developer of high speed imaging technology, was developing Swing Vision-type technology for CBS to track forehands, backhands and serves.

CBS plans to roll out a new and improved version of the "MacCam," its super slo-mo camera focused on the baseline that it has been using since 1996. Named after pro player-turned-commentator John McEnroe and developed by Tech Imaging, MacCam shots at the 2005 US Open will be seen in monochrome to allow for better resolution, according to Aagaard.

"We will have the option to colorize the scene and we intend to use this option," Aagaard said. "We are also looking to use a different camera angle to look at the 'side' lines that we believe will enhance some shots."

But the big news for all concerned was the United States Tennis Association's decision on whether or not to make electronic officiating equipment part of the official rules for the matches.

Ultimately, the USTA decided not to go ahead with the system, because, according to Technical Manager Dr. Stuart Miller, tests indicated that the technology failed to 1) stay within the margin of error for any reading, 2) make the correct call, and 3) achieve consistent readings for individual lines.

ELECTRONIC OFFICIATING

Instant replay is already a feature of broadcast tennis matches. In addition to CBS' MacCam, ESPN and USA Networks have used the Hawk-Eye system (re-dubbed "Shot Spot" by ESPN) for the past several years. Hawk-Eye, developed by Dr. Paul Hawkins and marketed by U.K.-based Hawk-Eye Innovations Ltd., is a computer-generated technology that uses telemetry data to track the ball wherever it lands on the court.

Fans have been made very aware of controversial line calls, thanks to the use of these technologies. In fact, last year's US Open included a flagrantly bad overrule in the final set of the Serena Williams-Jennifer Capriati quarterfinal match, which was caught by USA Network's Hawk-Eye. The call was against Williams, who ended up losing.

"Since the 2004 US Open, we have been testing various technologies that might be used as electronic officiating aids in tennis," said USTA spokesman Chris Widmaier. "We created an Electronic Line Calling Task Force" comprised of representatives from the USTA, International Tennis Federation, ATP (men's tour), WTA (women's tour), CBS, NBC/USA Networks, ESPN, former broadcasters and players, he said.

ESPN broadcaster Cliff Drysdale, a US Open doubles champ in 1972 and U.S. Championship singles finalist in 1965 was on the task force. A strong on-air advocate for sanctioning electronic officiating, he believes it would benefit the game, as well as broadcasts, by adding an element of strategy to the mix.

"If you limit the number of challenges that a player can utilize during the match—like in football—it becomes of strategic interest to the viewer," Drysdale said. "And it gives us, as announcers, the opportunity to say, 'well, that's one that he or she should have challenged.'"

FAIR PLAY

There's also the element of fair play.

"A wrong could be righted to some extent," he said. "Officials at the US Open were eager to get it to where they felt comfortable with [the technology's] accuracy so that they could use it at the Open."

Thousands of tennis fans will descend on Flushing Meadow for the 125th US Open, Aug. 29-Sept. 11, the final grand slam event of the year for professional tennis.

Word had it that the official comfort zone would have involved an upgrade in the current system used by broadcasters, which, according to one source, might involve sensors. The number of contenders for the technology contract had dwindled to one in May: the Hawk-Eye System. The ITF did a series of tests to determine accuracy in late July.

Drysdale said that extra time was never an issue, since the technology's feedback was virtually instantaneous—much faster than, for example, the system used by the NFL. More important was the USTA's rule book.

"It depends on how it's set up," said Gordon Beck, senior vice president for USA Networks, who was also on the task force. "If it brings another strategic aspect to the game, then that could be a pro."

Beck noted that broadcasters would generally back anything that could help bring a compelling story to viewers—as long as it's not "hideously expensive." He said that his network got "a lot of positive feedback about Hawk-Eye."

But TV upgrades for Hawk-Eye were put on hold pending the USTA decision.

A thumbs up from the USTA could have passed Hawk-Eye's cost on to the USTA, while forfeiting the sponsorship plugs enjoyed by networks. Moreover, CBS would have dropped the MacCam for the official technology for these calls.

Thumbs down may lead to a Hawk-Eye upgrade involving improved graphics displays. Rather than simply showing where balls land, Hawk-Eye could be used to illustrate trends in play.

"It may be that a first serve is dramatically slowing down in the second set," Beck said. Tracking data generated by Hawk-Eye could also give insight on top-spin and player movement relative to a ball return.

Eventually a decision may also be made to upgrade Hawk-Eye for HD. For the record, Dr. Hawkins stated to **TV Technology** that, "Yes, we can do high-def." ■

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Seeking Coverage In a Storm

As forecasting gets more sophisticated, meteorologists ramp up the graphics

by Claudia Kienzle

HAMILTON, N.J.

This year's hurricane season opened with Dennis and Emily, which reached Category 4 at their peaks. Many broadcast outlets offered continuous coverage as these storms blew through the Gulf region in quick succession, leaving considerable destruction in their wakes.

To cover such severe weather events, broadcasters find it essential to have a weather graphics system capable of illustrating changing weather conditions for the duration of the storm.

Many vendors have upgraded their weather graphics systems with tools and resources to help station meteorologists analyze and illustrate the wealth of complex, technical weather forecast data available to them. Producing a colorful, animated weather report that accurately depicts how and where a storm is likely to hit not only attracts viewers but potentially saves lives.

In addition, the use of weather graphics is also growing as broadcasters extend their on-air brand to new outlets, including secondary DTV channels, wireless devices, and the Internet.

A LIFE-SAVER

"Possessing outstanding severe weather coverage capabilities is important to the station from both a business and a public-service perspective," said Dr. R. Lee Rainey, vice president of marketing for AccuWeather in State College, Pa.

AccuWeather recently added two new modules to its Galileo weather graphics system—Predictive Radar and StormMaster—which enable broadcasters to be first-to-air with accurate, high-impact graphics that quickly convey weather data to viewers. Galileo Predictive Radar accurately predicts the movement, path, growth, and decay of storms in a station's DMA for up to four hours into the future.

"With Predictive Radar, viewers quickly 'get the picture' because it presents what will happen with the same familiar look as traditional, backwards-looking radar loops," Rainey said.

StormMaster adds a unique severe storms analysis capability. It applies "advanced processing to the latest NEXRAD Level II radar data, delivering the most precise, localized forecasts of the movement and evolution of tornadoes, the location and size of damaging hail, and the accumulation of precipitation from severe thunderstorm cells," Rainey said.

Weather Central's 3D X-Vision presents true 3-dimensional displays of radar from up to five NEXRAD Level II sites.

RISING ABOVE THE FRAY

AccuWeather also offers a promotional program called TotalWeather, which showcases the station's weather talent and brand on every screen in the market.

"The program consists of turnkey, mutually supporting weather content and brand builders... to lift stations above their competitors and enable them to follow viewers straying to other media instead of losing them," Rainey said.

These include: The Exclusive AccuWeather Franchise (a recognized brand name with extensive weather analysis support); the 24x7 Local AccuWeather Channel for secondary DTV channels; Premium V3.0 Wireless Weather, which extends branded weather content to cell phones; and Internet tools, such as AccuWeather.com WeatherHost, which enables a station to take its weather talent's voice and image to the Web without bandwidth concerns inherent in streaming.

Some broadcasters are going far beyond using their Web sites to deliver weather reports. "It's not just about making the forecast available online," said Steve Smedberg, director of marketing for Weather Central Inc. in Madison, Wis. "It's about making the forecast personal and accessible whenever and however the viewer wants it."

With MyWeather (Weather Central's sister company), stations can deliver a targeted, personal forecast using Personal MicroCast. "Stations can connect with viewers one-on-one through personalized online forecasts and customized severe weather alerts via e-mail and wireless devices," Smedberg said.

In June, Weather Central launched ESP:LIVE Exclusive Storm Prediction, a new 3D-based weather graphics system. It made its on-air debut on NBC Weather Plus and MSNBC during coverage of Hurricane Dennis' Florida landfall.

Leveraging the technology of Weather Central's :LIVE platform (including 3D:LIVE for "everyday" weathercasts), ESP:LIVE is designed for severe weather coverage, with real-time display of local radar, NEXRAD Level II radar from the NWS, and a host of storm tracking and analysis tools.

ESP:LIVE includes the Storm Vitals feature, which provides detailed information about the location, strength and characteristics of a storm—such as a tornado, hail, or strong wind gusts. Storm Vitals includes 3D X-Vision for presenting true 3-dimensional displays of radar from up to five NEXRAD Level II sites, and even "slices" the storm similar to a CAT scan, so viewers can see the location of the most destructive features.

WEATHERING THE STORM

"The big challenge of doing live severe weather coverage is juggling all of the new information that comes in with the fact that this must be done while on-air the whole time," Smedberg said. "Coverage of a tornado outbreak might go non-stop for a few hours, and hurricane coverage may be non-stop for days. We just introduced a hurricane tool for ESP: LIVE and 3D:LIVE that automates the tracking and forecasting of hurricane information."

WSVN, WLTV, and WPLG, in Miami, WJHG in Panama City, and WTVT, Tampa Bay, were among the Florida stations that used the Weather Central solutions for their recent hurricane coverage. In addition, MSNBC built a weather center where 3D:LIVE is used 24/7 for weather updates.

Weather Central also has partnered with NBC Universal to power the new national-local digital network, NBC Weather Plus.

NBC affiliates and O&Os in more than 50 markets are airing Weather Plus on their digital channels and have secured carriage by major cable systems. "Stations are being added weekly and NBC Weather Plus will be available in markets covering 70 percent of TV households by fall 2005," Smedberg said.

AN AERIAL VIEW

The Baron flagship product is VIPIR, a powerful, real-time 3D weather analysis and display tool that leverages accurate forecast data from Baron Advanced Meteorological Systems (BAMS). Recently, a free upgrade, VIPIR 4.5, added several features, including MicroTrac for automated, real-time fly-through of any area in the path of a storm.

"When used with Baron's aerial mapping, it gives viewers an eagle-eyed view of specific landmarks under threat in photo-realistic detail," said David Starnes, sales manager of Baron Services in Huntsville, Ala.

Many Florida broadcasters relied upon the Baron VIPIR for coverage of the four hurricanes that hit there in 2004. The stations included WBBH-TV in Fort Meyers; WJHG-TV, in Panama City; and WFTV-TV in Orlando.

Baron also donated mobile weather systems to emergency management personnel in Florida and Alabama to aid in hurricane tracking and recovery efforts.

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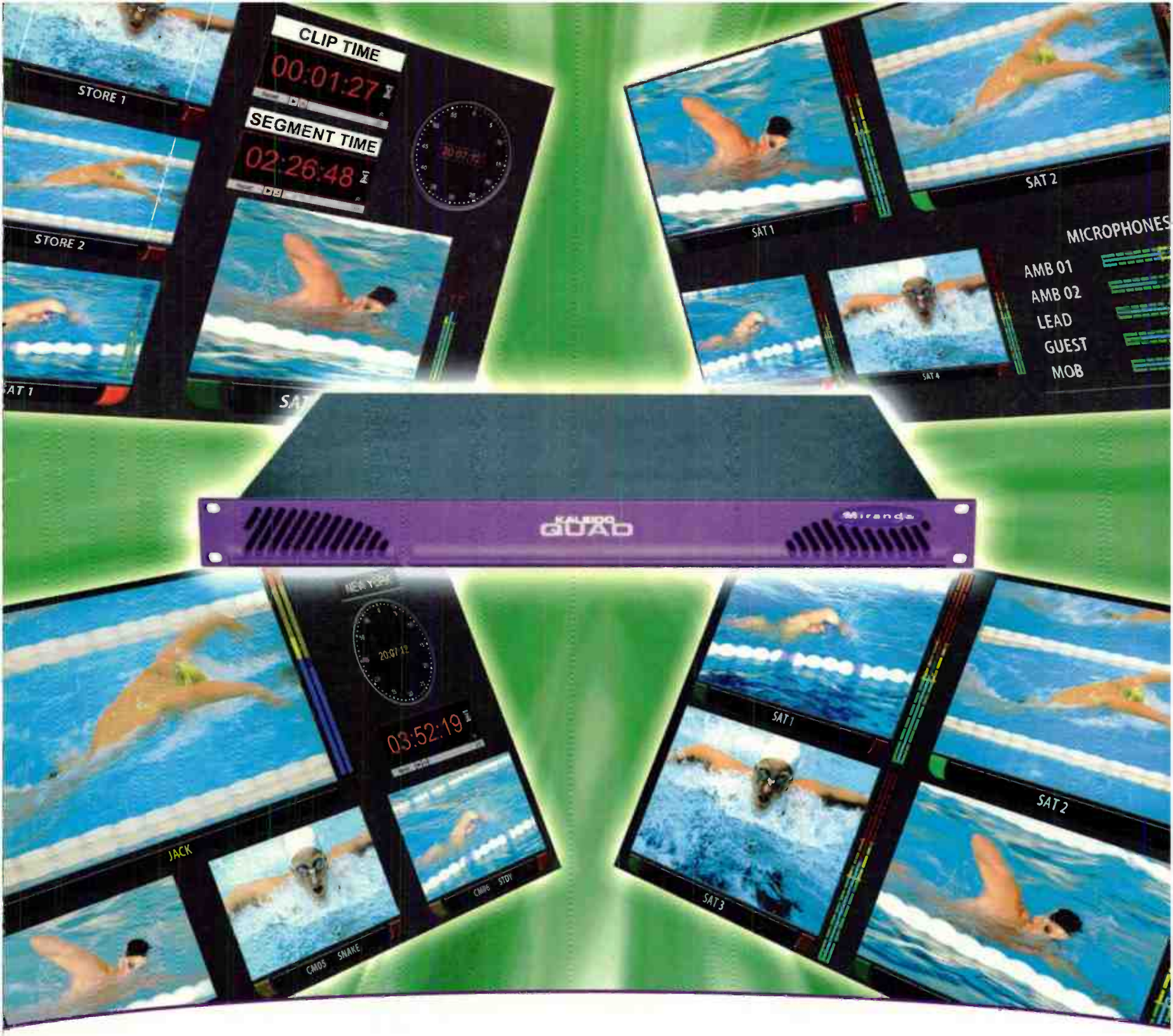

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HDTV: MAKING IT HAPPEN

HD Gives Glamour to Golf

CineAlta, Adobe Premiere Pro 'drive' creative process

by Jay Ankeney

TOPANGA CANYON, CALIF.

The challenge: make a commercial for a new line of golf clubs look radically different and yet appeal to the rarified taste of the key demographics of golf fans. The solution: don't make it look like a golf commercial; make it look like an ad for a European sports car.

That's what Leslie Allen, creative director at Cinergy Creative, conjured up for KZ Golf (KZG), a high-end golf head and club manufacturer, for spots slated to air during televised golf events on the PGA Tour.

"My intent was to make them look like commercials for a luxury car such as a Jaguar," Allen said. "In fact, we wanted it to be difficult for the audience to tell until the body of the spot that the commercial is about golf clubs at all."

To emphasize the metal-sculptured look of the detail on the KZG club heads, Allen chose to shoot the spots using the Sony CineAlta HDW-F900 HDCAM camera recording 1080 images at 24p.

"It was important to use the resolution of progressive HD recording to reflect the unique quality and craftsmanship of the golf clubs," he said. "Only the CineAlta camera could capture the film-style look we wanted to achieve and also let us manipulate the eventual visual effects within the color space we wanted."

Cinergy Creative is a full-service production and design studio tucked away in the Topanga Canyon hills above Los Angeles. The Cinergy portfolio includes effects and post-production work on broadcast projects including "City of Angels," "The Outer Limits," "Disney's True Life Adventures," "Spy Games," the forthcoming "eBay TV," and many commercials. Cinergy Creative has also contributed visual effects to feature films such as "Scooby Doo," "Dark Planet," "Inspector Gadget," and the upcoming "When Do We Eat?"

RAINBOW EFFECT

Allen put the KZG golf clubs on lazy Susans so he could rotate them under various light patterns to make them look like completely different objects.

"I wanted to get away from the usual look of high-tech chrome on golf clubs, so we pumped a lot of gold, red and blue light onto them to create a rainbow effect," Allen said. "The goal was to make it look as if we were actually passing light directly through the heads."

Some of the shots for the commercial required making it appear as if Allen had positioned three club heads side by side. But since their shafts were all of a different lengths, he had to shoot each one individually so he could composite them together later in Adobe After Effects 6.5. "This let us control the reflections from one golf head to the other, and the client really appreciated how well the 1080p recordings revealed the details embossed right into the metal," Allen said. "The result looks more like a print ad than the usual television commercial."

Allen used Adobe Premiere Pro 1.5 editing software to offline the spots using widescreen DVCAM dubs at 29.97 fps, creating the preliminary effects right in Premiere, including extra highlights and lens flares. By using multiple, nestable timelines in Premiere Pro, he was able to manage complex, multilayered animatics, which allowed him to experiment freely with the speed and direction of the image flow. Then Allen called upon Premiere Pro to re-batch digitize the HD material through a BlackMagic DeckLink HD Pro card with 12-bit color in letterboxed 16:9. He composited the final versions with After Effects boosted by the Sapphire plug-ins from GenArts because it gave him better masking control and text animation capabilities. As an extra touch, Allen created an animated logo for KZ Golf in Autodesk 3ds Max 7 software that included sparks and fire effects, and then rendered them out with its Mental Ray plug-in to emulate the illusion of the club heads being forged in a volcanic furnace.

Cinergy Creative rotated the KZG clubs on a lazy susan and captured them in various light settings to create the image of light passing directly through the heads.

> "This helped us get away from the conventional look of a golf commercial."
>
> —Leslie Allen
>
> Cinergy Creative

Two-dimensional graphic elements created in Photoshop were imported as text, animated in After Effects, and then positioned as lower thirds on the Premiere Pro timeline where Allen could adjust their speed in real time.

IMMEDIATE FEEDBACK

All through the post-production process, Allen output daily versions of each spot as QuickTime files directly from Premiere to distribute to the client over the Internet. He was then able to make changes almost instantaneously from the feedback.

Music composed for the spots by Joe DiBlasi on Logic software by Emagic was mixed along with sound effects and the voiceover into the final soundtrack using Premiere 5.1 capabilities.

"I wanted the kind of 'swoops' and 'whooshes' you would normally hear during a car commercial, intermixed with the 'whack' of golf balls being hit," Allen said. "Again, this helped us get away from the conventional look of a golf commercial."

The surround-sound audio may be heard during the HD broadcasts of golf tournaments, but it will also be included in the special high-resolution DVDs that Cinergy Creative burned so that KZG could distribute use for playback in golf equipment boutiques to demonstrate the beauty of their clubs.

Allen output the final version of the project directly from the Adobe Premiere timeline onto HDCAM tape for high-definition broadcast, and to Digital Betacam for standard definition, letting the desktop software handle the conversion from 24 fps to 29.97 fps for broadcast.

KZ Golf was so impressed with the commercials that they have asked Allen to follow up with another series that will compare the custom forging of the club heads with an English gentleman going for a personalized fitting session at his tailor.

"It was the interactivity of After Effects along with the picture editing and audio mixing capabilities of Premiere that made possible the production of these unusual spots on the budget we were given," Allen said. "No other combination of software could have preserved the original elegance of the CineAlta camera's 1080p images, and we felt this was crucial to produce the unique look of these golf club commercials that we were looking for." ■

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Satellite Offers HD Extras

Intelsat partners with HTN, Broadwing to compete with fiber

by Robin Berger

WASHINGTON

Major League Baseball has certainly stepped up to the plate to broadcast its games in high definition.

According to MLB spokesman Russell Gabay, "the number of HD games has risen dramatically this year to over 1,000 games—nine teams are not doing any" HD broadcasts.

He attributes the trend to the increase in HD channels provided by cable and satellite TV.

As a result, "any new stadium that's coming on line has to have a fiber plan," he said, and mobile production companies are "building HD units as quick as they can."

Although Gabay concedes that accessing the HD signal "has gotten better," he insists that "it's still not perfect—a lot of companies have to buy receive loops or equipment."

These costs, plus the high-priced HD trucks, encoders and other accoutrements, are an expensive proposition for broadcasters. As an alternative, Intelsat offers its GSX Terrestrial Media Transport Network, an end-to-end solution for HD production.

NEW PARTNERSHIPS

Hughes Television Network signed up for the GSX TMT in April 2004, when it was a product of partners Intelsat and network provider Level 3 Communications. Testing it through July, HTN used the network to officially launch an HD service in August for MLB events in five cities. Altogether, the service transmitted 100 MLB events in HD during the 2004 season, and 125 National Basketball Association games during the NBA's 2004-05 run, said John Rourke, executive vice president of HTN Communications.

"The initial five points of presence effectively cover our core trunk traffic," said Ken Takagi, director of Intelsat Media and Entertainment Strategy division, in describing the Intelsat-Level 3 footprint. "It carries a mix of full-time and part-time traffic, including a fair amount of HD."

Intelsat's GSX Network footprint spans the globe.

In April 2005, Intelsat introduced another network partner, Broadwing Communi- cations a Columbia, Md.-based provider of fiber-based networks that have a national footprint.

"The partnership with Broadwing enables us to expand the reach—we now have a total of 20 cities [from] which customers can access our network," Takagi said.

This is expected to increase to 30 points of presence, or POPs, by October, and to 52 by year-end, according to Del Bothof, vice president and general manager for Broadwing Media Services.

DTM DOES

Both Takagi and Bothof attribute the ease of expansion to Broadwing's DTM (Dynamic Synchronous Transfer Mode) infrastructure, which it adapted about two years ago. Takagi noted that DTM does not need terminal equipment required by rival ATM systems, thus making it cheaper to deploy new POPs.

DTM's ability to better leverage bandwidth also boosted transmit options from 45 Mbps to 270 Mbps (uncompressed standard-definition transport speed), Bothof said, a ceiling he attributed to the limitations of local loops to the venues, not his company's technology.

"We, as a team [Intelsat, Broadwing and HTN] are working together to try and get dark fiber out of the stadiums and arenas," said Bothof. "If we can, then we could go close to 1.5 gigabits per second, [like] the hi-def cameras in the production truck."

The extra bandwidth, said HTN's Rourke, also enables another nifty feature—remote production—aimed at minimizing the cost of lower priority live "C-games" broadcasts.

"We have equipment in those arenas and stadiums already," Bothof said. "There's no problem putting in additional cards, multiplexing that into this new network, and carrying camera angles directly back to the facility."

Takagi also points out that Intelsat rents out the most expensive component of the HD process: encoders (Tandberg 5782s and 5780s).

"This fiber network was specifically developed to support HD," Takagi said. "We support a first generation HD signal end-to-end, and we don't decode the signal in any way as it goes through our network."

At present, Takagi said Intelsat is in discussion with potential European partners to further expand its reach; it currently has a presence in London and Fuchsstadt, Germany. Last year, Intelsat established a fiber interconnect at Los Angeles to a fiber network operated by KDDI in Japan, which has subsequently booked Japanese clients for sports and events feeds from Europe and the United States.

CONVINCING THE PLAYERS

Rourke noted that HTN was contracted to deliver 250 games for MLB rights holders during the 2005 season—more than double last year's total but less than a quarter of the more than 1,000 events cited by MLB's Gabay.

One contractor who books MLB feeds said the industry is skeptical and confused about Intelsat's agenda. And it's satisfied with service from HTN's prime competitor, Vyvx, whose HD VenueNet service is contracted to transmit 122 MLB games in an HD format from 28 venues this year at a transmission speed of up to 270 Mbps, according to Vyvx spokesman Jeff Pounds.

"Their network doesn't reach as far as Vyvx's, though I'd like to see a network map," Rourke said, skeptical about Intelsat's claim of 20 POPs. "And I think a lot of people are confused by who brings what to the table there." ■

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SPECIAL REPORT

Finding a Home in Homeland Security

ENG technology: It's not just for broadcasters anymore

by Craig Johnston

SEATTLE

Go to an ENG van-builder's Web site and you're likely to see a button labeled "Government" or "Mobile Labs" or something similar. Homeland security, et al, has opened new markets for these companies that cut their teeth on electronic newsgathering vehicles.

With the U.S. and state governments rushing to fill their needs for high-tech vehicles, is any of this tax-dollar spending on research and development trickling down to broadcasters in the form of new technology for newsgathering vehicles? The answer is a mixed bag.

"I think it goes both ways, and probably more in the other direction," said Frontline Communications National Sales Manager Doug McKay. "I think the work that we've done in the broadcast vans, which we've done for years, is actually providing a better platform for the government guys who are kind of new at this."

"Cross-pollination's a good word," said Shook Technologies President Ron Crockett. "There has been a melding within [the new government] vehicles with both video, audio, telco communications and in particular, first responder communications issues."

These mobile command centers, built by Wolf Coach for the state of Massachusetts, include crossover technology with conventional broadcast units.

VARIATION ON A THEME

While video, as broadcasters think of it, is not necessarily the top technology needed by the public sector vehicles, X-ray scanners for border and port security is high on the government's list.

"A lot of our TV technology went in to that," said Crockett. "X-ray scanning and TV scanning are quite similar."

"The video and high-definition commercial, off-the-shelf video systems that broadcasters use are finding their way into military vehicles for various applications," said Thomas Jennings, broadcast sales manager at Wolf Coach.

And McKay said the government is benefiting from news vehicle nuts and bolts know how. "What we do with the TV trucks, the disciplines are all the same: weight/balance, a good safe chassis that's going to hold up and last, air conditioning, power conditioning, the interior finish that we do, and then the supporting communications platform."

"I think it's just sort of natural that if these government folks need the command centers, it's sort of a variation on a theme of what we've been doing all along," McKay said. "Maybe we don't need as many equipment racks; instead of putting four equipment racks we may just put in one, and a conference table, or a bathroom, or something like that.

"But I think that our government business that we're doing—the homeland security business—those guys are definitely benefiting from the design engineering and the experience of building the broadcast trucks for years."

WHAT'S GOOD FOR HOMELAND SECURITY...

If the government is borrowing video technology from broadcasters, the television truck market may soon be able to glean a new generation of communication and data transmission technology from the government programs.

"What they require [is] video over

IP or data communications," said Howard Kirsch, director of sales and marketing at E-N-G Mobile Systems, which builds mobile labs to investigate suspicious substances for the government.

"They want to be able to stay in touch with their main operations so they can have access to expertise while they're out in the field, so they can actually get online with their computers and say 'we found this material, we're not quite sure what it is, do you have an expert there who can help us with it?'" Kirsch said.

"We're doing some pretty significant R&D with some premiere companies that make routing systems, Cisco being one of them." said Jennings.

Perhaps this will lead to "a station being able to remotely control a vehicle, or being able to send information over an IP network," he said. "Essentially your truck would become an IP node on your network. You'd be able to both control and view what was going on inside the truck from a remote location."

Communications systems that can interoperate between a variety of different first responders is key for government vehicles, said Crockett, "so that if you have multiple people responding, if you've got the sheriff's department, and the police department and the fire department, and FEMA and somebody else, even government military, these vehicles have to be able to communicate with each and every one of those folks in a practical manner.

"It's giving us more insight into ways to communicate that are not traditional in terms of what we do out in the field," he said. "And that is anything from Wi-Fi to fiber optics that have not been historically used for news applications as we know it."

Government vehicle mandates are prompting van builders to develop IP-based phone systems to be interfaced so that the truck's phone system is no longer cellular- or satellite-based, according to Jennings.

An IP-based phone system "becomes an extension of your existing network inside the station," Jennings said. "This will drastically improve both the reliability of the communications in the truck, and also the costs should come down extremely so you're not having to pay cellular and satellite telephone bills."

Not all of the government's technology is going to find its way to broadcasters soon, said Crockett. "In many cases they have their own proprietary hardware and encryption systems that are certainly high security, so we don't get in to actually seeing that stuff, we just wire for it and/or integrate a space for it, and then they'll put it in themselves."

The same goes for homeland security mobile lab applications said Kirsch.

"We do some video and some RF, but mostly it's very sophisticated diagnostic tools," he said. "They want to go into an area with their 53-foot laboratory, and have their tools to diagnose what that white powder on the desk is: is it talcum powder or was it anthrax?"

"We are using ruggedized computer systems for military applications that are finding their way into ENG trucks and news trucks," Jennings said. "But there's only so much you can do to ruggedize the equipment itself. Our trucks have always been built to almost a mil-spec standard, that's just the way we build them."

Shook Mobile Technology outfitted this data acquisition vehicle for automotive instrumentation at the Aberdeen Test Center at the Aberdeen Proving Ground in Maryland.

Where most broadcasters were able to take existing employees with technical RF and video backgrounds and staff their live news vans when the ENG era dawned, many in homeland security and the military who man these new government vehicles don't come primarily from that field. Crockett said that has spawned simplified hardware and systems that may benefit broadcasters looking to "one-man-band" their news vehicles.

"[The military and other agencies] have got to be able to do it in a way... [that is] very intuitive in terms of what you design and how it would work."

There's a final effect all this government work by the news vehicle builders is having on broadcasters, and it's not necessarily positive. "Most of the truck builders are back-ordered three to six months or more," Crockett said. ■

ENG Safety

CONTINUED FROM PAGE 1

four ENG vehicle builders about the state of news van safety since CAL-OSHA. Each of them noted that they build CAL-OSHA compliance into their news vehicles whether they are delivered to California or other areas of the United States.

AS CALIFORNIA GOES...

"California sometimes leads the way in a lot of things," said Howard Kirsch, director of sales and marketing for Concord, Calif.-based E-N-G Mobile Systems. "I think California OSHA had led the way in safety in this country in a lot of areas, including ENG safety."

ENG equipment vendors are investing in more technology to warn drivers when masts and dishes exceed height limits.

In fact, the van builders say their news vehicles were built more-or-less in line with CAL-OSHA prior to the regulations. Our ENG vans "always were CAL-OSHA compliant, less a few placards and things that we've adjusted to meet the new requirements," said Tom Jennings, broadcast sales manager for Wolf Coach in Auburn, Mass.

While van makers say they were already paying attention to such safety concerns, CAL-OSHA may have helped their customers get religion on the subject.

In the past "customers would have creative folks on their staff that would override the safety features that we would install on the trucks," said McKay. "What's had to happen is our customers have had to adopt a company policy to say, 'if you're going to operate this ENG van, you need to play by the rules.'"

However, Mark Bell, who has written and lectured on news van safety and manages the Web site, *engsafety.com*, said van operators often still feel intense pressure from those back at the newsroom to get the van up and operating, and can experience "task-overload" that can lead to mental errors. To require operators to pay attention to the mast while it deploys, CAL-OSHA mandated constant pressure switches.

But Bell noted that some companies have in-house cultures that encourage operators to find a way around such safety devices, describing one operator involved in a mast-electrical line accident who was taught to jerry-rig such a switch.

"He had actually been taught by his station to get the generator going, and then move the lever to move the mast up, and secure it with a rubber strap," he said. "That was in the OSHA notes in the investigation."

Hopefully such practices have become less commonplace with the new regulations in place.

"Customers are proactively purchasing safety devices, warning devices, and spending extra money to go the extra mile to try to make the trucks safer," said Ron Crockett, president of San Antonio-based Shook Mobile Technology.

One such device is the Will-Burt D-TEC AC Field Detection System, which has been available since 1998. Sitting atop a news van's mast, the system is both an overhead sonar detector and alternating current detector.

Will Burt says it has begun a process to enhance the sonar and AC detection abilities with the D-TEC II. Though the device is undergoing field-testing and not yet in production, the company touts the D-TEC II as another important safety device.

WATCH YOUR WEIGHT

Ed Williams, director of engineering for KPTV, the Fox affiliate in Portland, Ore., led a disciplined ENG safety program for years before the CAL-OSHA regulations, and he wonders how much CAL-OSHA really hit home.

"I haven't really gotten a feel from anyone that CAL-OSHA has made any impact beyond the first couple of weeks when the announcement came out, and everybody said 'we better get the new gear.' Beyond that I really don't hear about it too much," he said.

This ENG truck mishap in Australia illustrates the dangerous results when masts hit power lines.

All van makers **TV Technology** spoke with said one issue outside the CAL-OSHA regulations remains an area of concern: news vehicles that exceed their gross vehicle weight (GVW) limitations.

"We're very, very conscious of truck weight and GVW, truck safety, so we try to use, as best we can, the lightest, more durable materials to keep the truck weight down," said Kirsch.

"We have customers demanding more and more hardware in these news vans, and now we're reaching the maximum weight limits," said Crockett. "We build them, as does everyone, to be safe when they leave our facility, but we have no control over what they put in them once they get out of here."

If it looks like they will overload the vehicle once it's delivered, "then you sort of advise them to go with the next chassis up," McKay said.

Jennings pointed to an additional problem. "There are manufacturers out there who are re-rating the OEM GVWR on vehicles and sending them into the field that way," he said, making tire, spring, and other changes to the vehicle.

"The vehicle was designed to handle a certain amount of weight, and that is, by far, the more critical issue at this moment than the CAL-OSHA safety," he said. "[It's] just dead wrong. If not illegal, it's extremely risky."

Crockett said he thinks one way of lowering news vehicle weight as well as the center-of-gravity is through power take-off (PTO) generators that mount in the vehicle frame and use the vehicles engine for power instead of a separate engine.

"Because they're lighter in weight than the gasoline or diesel-driven units, that saves payload, which gives us more capacity aboard without keeping them up at the maximum weight," he said.

"There are some PTO generators that we can do 12, even 15 kW and fit them under the truck in the frame rails. That doesn't take up internal space, where these things may weigh 200 pounds," he said. Conventional generators bigger than 7 kW "can easily weigh 400 pounds, so we can save a couple of hundred pounds."

ENG Safety's Bell gives the post CAL-OSHA period this mid-term safety grade: "Has there been an official rifle shot across the bow of the ship called 'electronic newsgathering?' By all means. Is it being respected by corporations? Yes," he said.

But is it enough? "I sometimes feel that in the industry in general, there's not quite enough spent for prevention as could be," Bell said, "and the dollars for an accident are huge. So it's really kind of a penny-wise/pound-foolish approach."

Ultimately though, Bell said, the van accidents are human tragedies. "Lives can be affected for generations." ■

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HDNet Gets Behind the Scenes at NASA

Network provides unfettered behind-the-scenes coverage of the shuttle's return to space

by Susan Ashworth

CAPE CANAVERAL, FLA.

When the space shuttle took off from Cape Canaveral in July, viewers saw the orbiter blast off into space, and a whole lot more.

With 14 HD cameras, HD lenses, myriad HD production equipment and a production crew from HDNet, viewers were taken on a high-definition adventure both on and above the ground.

Using a mix of handheld and POV cameras positioned throughout the Kennedy Space Center, HDNet made a clear break from the coverage that viewers traditionally see on broadcast television. Rather than showing clips of the astronauts and the launch mixed with commentary and commercials, viewers watching the shuttle launch on HDNet saw unfettered, continuous coverage of the astronauts and the launch, from beginning to end.

HDNet's live coverage began on the morning of the launch date with behind-the-scenes access to the astronauts and their families as they ate breakfast, suited up, boarded the shuttle and completed their pre-launch routine inside the crew module.

Space Shuttle Discovery blasts off on July 26 on the first shuttle mission in two and a half years. Hundreds of hi-def cameras monitored the launch.

With guidance from NASA, HDNet placed remote-controlled POV cameras in the dining room while the crew sat down for breakfast with their families, and had remotely operated cameras in the clean room while the crew suited up for the launch. HDNet also installed 1080i cameras in the so-called "firing room" where engineers and administrators directed the countdown. One SD camera on the shuttle itself was upconverted to HD.

The entire launch procedure aired on HDNet without interruption, save for the quiet conversations of the astronauts, announcements from NASA and countdown information from mission control. The network also planned to cover the shuttle's landing, scheduled 10 days later.

Giving viewers an unobstructed, behind-the-scenes look allows viewers to experience an event in a way that just isn't an option with traditional news coverage, said Philip Garvin, general manager and cofounder of HDNet.

"We want to give you the whole thing, as if you were there, hearing it and seeing it for yourself," he said.

This live and uncut format is one that viewers find refreshing, Garvin said. "HDNet has been doing special events [like this] since the beginning," he said, referring to the network's beginning-to-end coverage of events such as the first open elections in Baghdad in 50 years in January, and the funeral procession of Pope John Paul II in April. This is HDNet's first joint effort with NASA.

AN INSIDE VIEW

The agency gave HDNet unusual access for this shuttle launch, the first planned liftoff in two and a half years following the shuttle Columbia disaster in February 2003.

Rather than being in an outside production truck with the myriad other international and national broadcasters, the HD broadcast and production gear from HDNet was brought into NASA's own broadcast center. A satellite uplink truck sent signals up to the cable and satellite networks that carry HDNet's programming, including DirecTV, DISH Network and Time Warner Cable.

Technology on-site included Sony 900 series HD cameras, Grass Valley 6000 series HD cameras and several Sony HDV cameras. Cameras were outfitted with Canon DIGI SUPER 86 TELExs lenses, which are capable of a 2.322mm focal length. This focal length enabled a 1080i camera to follow Discovery 33 miles into the earth's atmosphere.

Other technology included a Grass Valley Kalypso HD switcher with 4 ME, an Eagle Pan Tilt robotic-head system stationed at the launch pad, an EVS four-channel replay system, several Sony HDCAM VTRs, Leitch X75 frame synch converters, several Snell & Wilcox frame sync systems and long runs of fiber from Telecast Fiber Systems.

"These will undoubtedly be the highest quality pictures ever broadcast of a space shuttle launch," said Mike Rein, head of Media Services at NASA's Kennedy Space Center.

NASA's return to flight has been a much-debated and long-anticipated process, replete with successes, setbacks and a seven-astronaut crew that by all accounts was itching to get back into space. However, the space agency announced one day after the launch that it was grounding the entire shuttle fleet indefinitely because falling debris from shuttle launches continue to put the shuttle in danger; the Columbia Shuttle disaster resulted from tiles damaged from falling debris when it launched in 2003.

NASA made its decision after examining the myriad hi-def footage from hundreds of cameras trained on the shuttle. This was the first time that the agency had used HD technology to such a large degree for a launch. After the images were gathered, they were uploaded onto SGI visualization and storage systems where the film was scanned and stored. The NASA Ice/Debris team projected the images using the JVC DLA-QX1 to view and analyze ultra high-resolution images onto an eight-foot wide screen. Two high-speed airplanes outfitted with HD cameras also tailed the shuttle as it made its ascent.

Apart from the equipment supplied by HDNet, NASA took its own close-up images of the exterior of the shuttle via Panasonic AK-HC900 HD progressive-scan cameras as well as images of the astronauts inside the crew module. NASA had additional tracking cameras and long-range optical systems posted for several miles up and down the Florida coast. ■

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Virtual Finds a Real Market

Set technology makes a comeback

by Susan Ashworth

SAN FRANCISCO

One thing is for certain about virtual sets—it's a technology that's been run through the wringer.

The technology was originally touted as a way to eliminate expensive broadcast sets and to transform a television studio into a whatever ingenious backdrop or fanciful scene that a producer wished. Want to be atop the Eiffel Tower? In a high-tech studio? Standing among the stars? A virtual set could get you there.

For all its offerings, however, the technology was given an appreciative but wary look by the broadcast industry, from set designers, engineers and producers alike. Critics said the resulting images, while inventive and impressive, often didn't look sharp or crisp enough, particularly for U.S.-based television news stations. New solutions continued to hit the market, but broadcast buyers were relatively limited compared to the hopes of manufacturers. Though the technology continued to evolve, the virtual set market got a little bit quieter.

"It was a very scary thing for people to get into," said Mark Randall, president and chief magician for Serious Magic, a Folsom, Calif.-based manufacturer of virtual set technologies.

Now, more than 10 years after appearing on the market, virtual set technology has seemed to have found its niche.

"We've seen explosive growth recently," said Randall, pointing to a drop in price and improvement in technology. "Ten to 12 years ago, virtual sets were a pretty challenging thing to do. The interest was always there, but it was limited by the cost and the complexity of implementation."

Devlin Design Group has seen a growing demand for hybrid solutions—studios that include both a hard and virtual component.

Although fewer virtual set manufacturers are offering solutions today, existing virtual set technologies are finding a solid market nonetheless. While they continue to tap into the mainstream broadcast market, the sets are also finding strong support with religious broadcasters as well as in the corporate, advertising and educational markets.

It's finally gotten feasible for smaller-sized networks to use these tools, because the drop in the cost of technology has made them more financially feasible, said Tim Hedegaard, president of Virtualsets.com.

Hedegaard has ridden along with the virtual set industry's ups and down, having started a studio design firm in 1995 that was focused on both hard and virtual sets. Around 1997, he realized that the virtual set market had real growth potential, and revamped the firm to focus solely on designing virtual designs. Today Virtualsets.com has designed sets for broadcasters such as Iowa Public Television, Nebraska Public Television, networks in Canada as well as corporate clients such as HP and Intel.

As more broadcasters worldwide see the benefits of the technology, firms like Hedegaard's are beginning to see increased demand.

"We're seeing significant demand every year for this technology, as much as four times more than the previous year," he said. "Without a doubt, the technology is much more understood."

A HYBRID SOLUTION

But other design firms say the future isn't just a virtual one: it's more of a hybrid solution that combines virtual and real sets, especially for mainstream broadcasters.

"I don't think demand ever took off in the way that virtual set manufacturers thought it would," said Dan Devlin, creative director of Devlin Design Group, a firm that designs for both hard and virtual sets based in Frisco, Colo.

Rather, Devlin said, "We're seeing a demand for hybrid solutions that include a traditional hard set as well as a chroma-key in a second room for a virtual solution," he said. "Without a doubt, there is entirely more flexibility and creativity inherent with virtual. There are things that simply aren't feasible to do in the real world that are made possible with virtual."

One example is the Splash Media "Trader's Television Network," a satellite program that airs on DirecTV. The varied and futuristic-looking sets used on the program would have been impossible to build under budget in the real world, Devlin said.

The virtual set market has also found success outside the United States, most notably in the advertising and sport markets of Asia and the United Kingdom. Orad Hi-Tec Systems recently nabbed a $3 million contract with the Dutch production house WK Producties for producing virtual advertisements and sport enhancements for the Dutch Football Premiere League Eredivisie, with Orad CyberSport. Orad also recently signed a contract with Italian broadcaster RAI TV, for a multichannel virtual set system. The company's CyberSet is also being used live on air by QVC, allowing the shopping network to refresh its sets and backgrounds based on the product the network is selling.

Other virtual set solutions on the market include those from Hybrid MC, which offers the EasySet line of virtual sets; Getris Images, which manufacturers the PSY line of virtual set solutions such as PSYset; the Brainstorm Multimedia eStudio virtual studio system, which works in conjunction with the digiStorm system from For-A; and Serious Magic, which offers the Ultra virtual set line.

Another virtual set manufacturer, Vizrt, offers the Viz|Virtual Studio, which has been used by CNN, CBS, Sky News and NHK to create virtual environments.

Many of today's virtual set systems can be implemented by a single person without a dedicated studio. And as the technology's proponents say, cost has been a key reason for its current success.

"Now you can build a set that looks like a $50,000 hard set without spending that kind of money every time you want to design a new set," Randall said. ■

Weather

CONTINUED FROM PAGE 10

TIMELAPSE IMAGERY

WeatherBug Zoom 2.0, released last spring by Germantown, Md.-based Weatherbug, allows stations to leverage the power of more than 8,000 WeatherBug Tracking Stations and 1,000 WeatherBug cameras nationwide, as well as NWS data.

"All WeatherBug Zoom customers use our product as the highlight of their on-air weathercast to present live, local conditions from any of our WeatherBug weather stations and cameras throughout their DMA or the country if more interesting weather is occurring elsewhere, such as hurricanes or blizzards," said Terry Hambrick, vice president of media services for WeatherBug. WeatherBug Zoom customers include NBC O&Os, Telemundo and LIN station groups.

Chief Meteorologist Roland Steadham of WTVJ-TV in Miami noted the convenience of being able to switch from one Weatherbug site to another as a valuable feature during its coverage of Hurricane Charley.

"Not only were we able to monitor current winds," Steadham said, "but the time-lapse video of a site in Naples actually showed people clearing out of the beach as the storm surge moved in. It was quite dramatic."

Weather graphics that illustrate the drama of severe weather events may get the most attention, but visualizing everyday weather events are equally important, according to Linda Maynard, vice president of media marketing at WSI Corp. in Andover, Mass.

"There are many more conditions that disrupt our lives outside the life-threatening events like hurricanes, blizzards, and tornadoes. Extreme heat or cold, poor visibility, and high winds have a big impact on people's lives and provide an opportunity for broadcasters to take advantage of their biggest draw—and the number one reason people watch local news—local weather coverage."

The WSI TrueView TITAN forecasting and 3D visualization product uses volumetric radar data to create live 3D radar images using the company's unique, advanced algorithms.

"Viewers find our realistic depictions of weather more useful and easier to understand, and weathercasts look more polished and credible with more immediacy and relevance," Maynard said.

Station groups using TITAN include Viacom, NBC O&Os, ABC O&Os, Raycom, Hearst Argyle, and Gannett. Other users include CNN, Fox News Channel, and "The Today Show."

WSI also offers PowerSTREAM DTV, a solution for DTV channels that produces continuously updated weather reports and maps.

"Its automated features ensure that labor and overhead are minimal," Maynard said. "And for instant desktop information for Internet users, WSI's PowerSCREEN [supports] a station's brand; easily integrates advertising content; and can be tailored to the user's preferences."

Weather Metrics Inc. in Lenexa, Kan., offers 24x7 Weather.Net, a 24-hour automated, turnkey local weather programming channel capable of creating live, dynamic graphics and animations on the fly. The product can ingest data from any weather, news, or Internet system in the industry. All information ingested by 24x7 Weather.Net can be placed on the broadcast station's Web site automatically, and vice versa.

"Over 90 percent of our clients have found placement on their local cable system in their markets. 24x7 Weather.Net has been on the air at our client stations for over two years, which is longer than any other 24-hour weather programming channel in the industry," said Peter Levy, president of Weather Metrics.

Station groups broadcasting 24x7 Weather.Net on their digital tier include Gannett, Allbritton, Scripps, Gray, Meredith, and Young Broadcasting. ■

FOCUS ON EDITING — Jay Ankeney

HDV Infiltrates Regular Television Production

They said it couldn't be done, but now that the long GOP recording format called HDV has found its way into the hands of real-world editors and production folk, it is starting to prove that a lot of the early skeptics were wrong.

Long GOP, or "group of pictures" is, of course, a clever way of squeezing a high-definition image onto a mini DV cassette tape, but the very complexity of that cleverness at one time seemed a barrier to editing and effects manipulation. Yet as we discussed in last month's column, the representatives of most of the major edit software manufacturers were able to claim the ability to edit HDV. This month, we are going to gather some real-world experiences of early adopters who have successfully wrestled with the challenge of posting HDV.

Robert Schaeffler is editing a pilot at House Blend Entertainment in Burbank, Calif., called "Ride America" that is making extensive use of several Sony HVR-Z1U camcorders that record in the 1080i version of HDV.

Reflecting the modern Harley-Davidson motorcycle culture of middle class enthusiasts rather than the black-jacketed rebels of yore, "Ride America" is intended as an hour-long episodic series hopefully destined for the fall season on either Spike or The Travel Channel.

Schaeffler is cutting the show with Final Cut Pro 5 on a PowerMac dual 2.5 GHz G5 platform running OS 10.4 (that's "Tiger" to Mac fans), feeding hours of source material from a Sony HVR-M10U HDV deck into 3.5 TB of Xserve RAID storage. During an elaborate sequence about the Laughlin River Run in Nevada, the "Ride America" crew had four HDV cameras covering the annual gathering of up to 100,000 bikers.

Co-executive Producer Robert Schaeffler(r) and Director Steve Race(c), make changes to "Ride America," a pilot shot with Sony HVR-Z1U camcorders, which record in the 1080i version of HDV.

This column makes a policy of not knocking mainstream technology unjustly, but it was noteworthy that Schaeffler is mixing this HDV material with footage shot using a specific HD camera costing six figures, and said, "To be honest, I'll never use [that camera] on a television show again. If you had told me this three months ago, I'd have said you were crazy. But now that I have personally compared its images with HDV. Financially it is just not worth it."

Even on as complex a production as "Ride America," Schaeffler has found editing HDV a breeze.

"We have a highly tricked-out system to work on," he said, "and even using the 1080i/60 rate for improved graphics, it's as easy as cutting DV."

FROM ANALOG HD TO HDV

David Niles, president of Colossalvision, a complete HDTV facility in New York, was the first editor to post a high-definition production for commercial use (a spot for Metal Five motor oil additive) when he acquired an HDVS 1125/60 analog system from Sony way back in 1984, so it is not surprising he took an early look at HDV.

"We use it basically for second unit photography," Niles said. "We shot with a 1080i camera, a VariCam and an early HDV model and found that under the proper lighting conditions, it is possible to intercut between them. Subjectively, after color correction, it is hard to tell the difference between a full broadcast-quality HD camera and the smaller format."

There is a down side, however, Niles reflects with wry wit.

"I own 15 $100,000 cameras, so I am not all that happy that now I have a $4,000 camera that can sometimes compete with them. It all goes back to what you are shooting. If I'm at a rock concert getting a low-angle shot of the kick drum, HDV is fine. I might want the bigger cameras for the glamour close-up of the lead singer, though."

Originally, Niles would run his HDV through an A/D converter and use a Pinnacle CineWave board to capture it as uncompressed HD for editing.

"Recently, we have been editing some native HDV sequences in Final Cut Pro, but since most of our product ends up in either broadcast or very large screens, we need 10-bit uncompressed quality for the high-end effects," Niles said. "So although the 25 Mbps of HDV is sufficient for acquisition, the artifacts from elaborate blurs and dissolves gained while editing on an HDV timeline can sometimes be too much. But we are doing a roadshow for Federated Department stores right now and about 25 percent of it will be shot and edited in native HDV."

DEMAND FOR HDV POST

Broadway Video, a full service film/TV production and design facility in the Big Apple, has found its broadcast clients are increasingly calling for HDV post capabilities.

"What we've seen a lot of producers get excited about HDV is simply that the price-point for the equipment is so much lower," said Claire Shanley, director of technology for Broadway Video, "which we're glad to say leaves more of their budget for post."

Handling HDV has presented few challenges because Broadway Video upconverts it into Avid Nitris systems to finish projects with a conventional workflow. And the folks there expect the format to grow in popularity.

"Just as miniDV has become commonplace for SD being used for 40 to 50 percent of our broadcast productions, we expect HDV will become a de facto standard for high def in the future," said Mark Yates, president of the Video Services Group for

HDV, PAGE 28

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DIGITAL TV

Charles W. Rhodes

RF Power to the People: Measuring DTV Signals

Recently, a reader wrote to me seeking a copy of a paper on measuring the transient peak-to-average power ratio of DTV signals.

So perhaps the topic of DTV signal power, which is so different from analog TV signal power, is of interest to many readers.

The power of an analog signal is always measured as peak power, which is the power level reached while transmitting the synchronizing pulses. The FCC rules are written about peak visual power because it is easily and accurately measured. The average power of an analog TV signal fluctuates widely with the brightness of the scene. The average power is inversely related to the scene brightness, or its DC level.

A dark scene has a very low average picture level, while a very bright scene has a high average picture level. Furthermore, the average scene in a film is somewhat different in brightness than the average scene of a program shot by a studio camera.

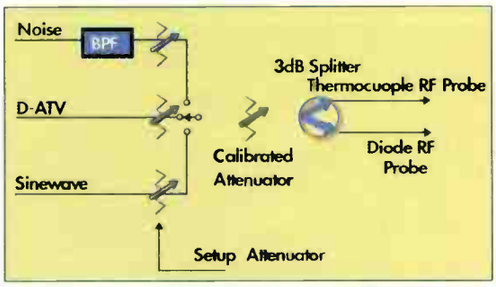

Fig. 1 Experimental setup to determine linear dynamic range of RF power meters for DTV

The average power of a DTV signal is independent of scene content, while the transient peak power is a statistical property of the datastream being transmitted. FCC rules require measurement of the *average* power of DTV signals. In theory, transient peaks exceed the average power by a very large ratio—6 to 10 dB if one waits long enough to capture such elusive events.

The 6 dB transient peak-to-average power ratio was measured by the Advanced Television Test Center in 1995 at the output of the 8-VSB exciter used in testing the Grand Alliance DTV System, now the North American DTV standard.

Specifically, the 6 dB value is not exceeded 99.9 percent of the time. Put another way, transient peaks greater than the average power plus 6 dB were found 0.071 percent of the time. Higher values have been reported, but are less frequent. These figures are for the DTV exciter output. I am not aware of what would be measured at the output of a DTV transmitter, but it would be lower than exciter output due to compression in the high-power stages of the transmitter.

The FCC does not require broadcasters to measure their transient peak-to-average power ratio. They are required to measure the average power output of the DTV transmitter.

For a broadcaster considering using his NTSC transmitter for DTV, this 6 dB transient peak-to-average power ratio is important. Suppose the NTSC transmitter is able to provide 5 MW of effective radiated power at peak of sync. This is 37 dB above 1 kW, or 37 dBK.

The transient peaks of our DTV signal must pass through the transmitter, and since those peaks are 6 dB above the average power of the DTV signal, one might argue that we could get up to 31 dBK ERP (average) with an NTSC transmitter setup.

The maximum ERP for DTV in the UHF band at 615 MHz is 30 dBK. However, some transmitters would not meet the linearity requirements implied by the FCC DTV RF mask without some power back-off.

SIGNAL BEHAVIOR

Transient peak-to-average power ratio refers to the characteristic of digital signals in a bandwidth-limited channel. The easiest way to think of this is to start with an analog baseband video signal. Before an analog baseband signal can be digitized, it must be restricted in its spectrum so the sampling process does not generate aliasing.

If the sampling rate is 13.5 MHz, all video frequency components more than half the sampling rate must be removed by a low-pass filter. So 6.75

POWER, PAGE 32

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HDV

CONTINUED FROM PAGE 24

Broadway Video. "Although we don't see ourselves installing a dedicated HDV edit bay in the near future, in as big a post house as this, it's just becoming one more tool in our media set."

Helping spread the word about the potential of HDV post has been Mannie Frances, managing director of Sundance Media Group in Stockton, Utah, whose training arm, VASST (Video, Audio, Software, Support and Training) conducted a five-city "HDV Solutions" tour for Sony last June showing how HDV can be edited with Sony Vegas 6 software. In fact VASST makes a plug-in for Vegas called GearShift that, among other features, lets computers with slower processors increase their editing performance by cutting with DV proxies once HDV's .m2t (the suffix for MPEG-2 Transport Stream) files have been captured.

"We demonstrated editing HDV live before hundreds of professionals during the tour," Frances said. "People were impressed with what we could do with HDV editing today, but the missing link is, there is no convenient delivery vehicle for the format. However, we think it will have great value for archiving, and ultimately get applied to broadcast and streaming projects through the new H.264 codec as MPEG-4."

The "Ride America" crew sets up the final shot.

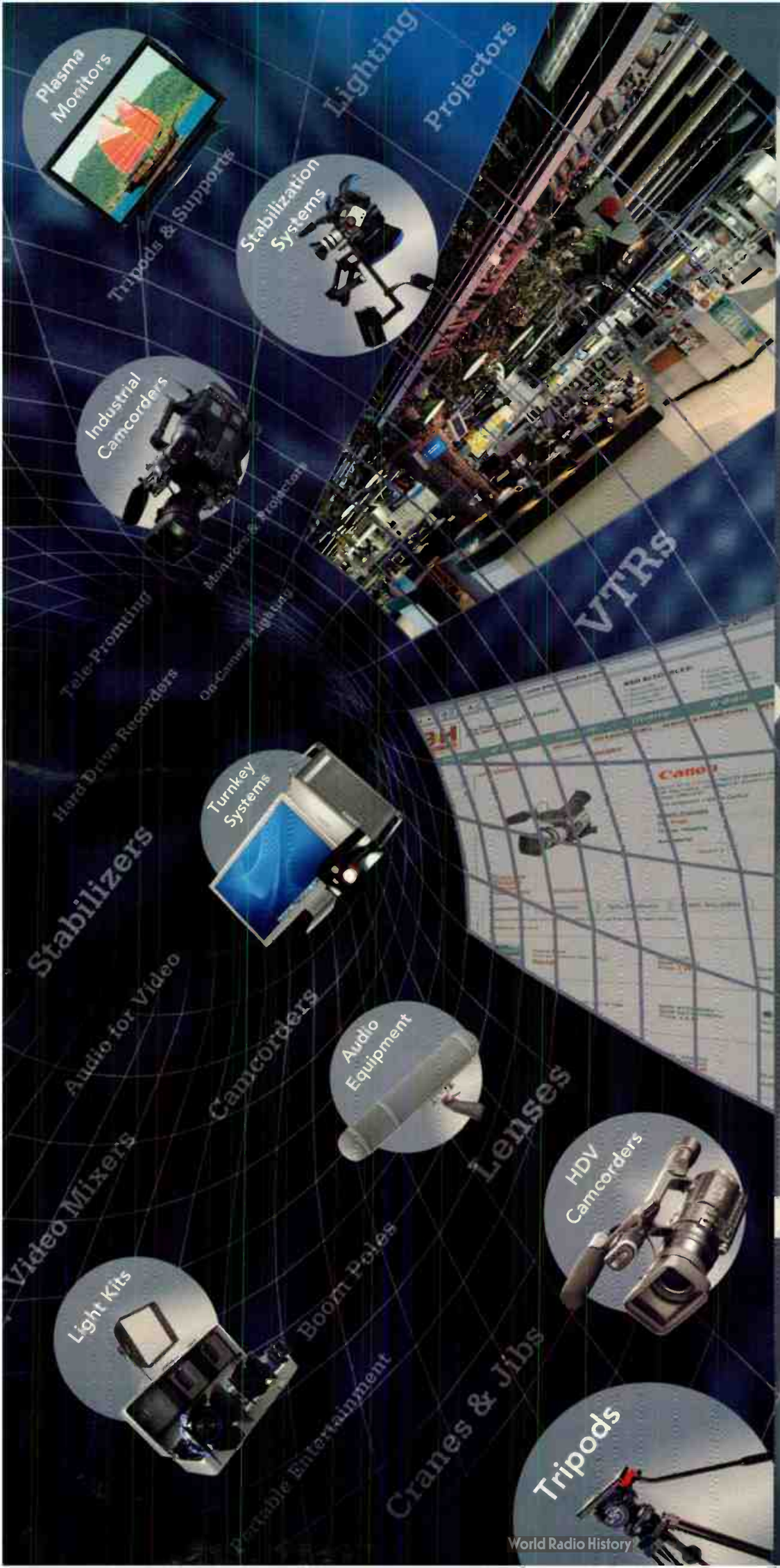
Currently, the DVD Studio Pro module of the Apple Final Cut Studio suite of software has the H.264 codec as part of QuickTime 7, which will allow you to burn a DVD from HDV material. But then you can only play it back on a PowerMac G5. Standalone DVD players for this high-def material are expected from several companies soon.

"People were impressed with what we could do with HDV editing today, but the missing link is, there is no convenient delivery vehicle for the format."
—Mannie Francis, Sundance Media Group

The next big step in the HDV saga will be the release of the JVC GY-HD100U camcorder that is promised to happen this month. The GY-HD100U will bring 24p recording into the HDV game, along with interchangeable lenses and the option of recording to a removable hard disk.

As soon as people get as much experience with this new area of digital cinematography as they have already gained with the Sony 1080i approach, we'll try and bring you the results. ■

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.



INTO THE SOURCE

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Let's Talk About Optics Downticks

You might not have noticed that neutral-density filters are our friends. But first, you also might not have noticed that OConnor introduced some HDTV camera mounts at April's NAB show. I am *not* making this up.

Now then, I happen to believe that OConnor makes fine camera mounts, and I can understand how they might think that the adjective HDTV makes them seem extra stable, but there ain't anything HDTV about them. OConnor's marketing types are just following in the footsteps of folks like the founder of Videssence, who once described the output of his products as "high-definition light."

There ain't any such thing as HDTV light. There ain't any such thing as an HDTV tripod or panning head. There ain't HDTV wires, cases, equipment racks or gaffer tape.

I'm ticked off by OConnor's recent misuse of HDTV on account of it diluting the real meaning of HDTV—that is, if it still has one. Yes, you guessed it. In this lunar cycle's rant, I'm going to delve into optics.

Let me get the put-off stuff out of the way right up front. I'm going to mention Airy disks and the Rayleigh criterion. Don't panic! I promise you can forget all about them the instant you finish this column.

Imagine you're a commanding officer, you've got a line of a thousand soldiers side by side in a field, and you tell them to charge straight ahead. Chances are, unless they hate your guts, they'll pretty much charge straight ahead.

Now imagine the same thing, except this time, there's a gigantic wall halfway down the field and it has a slit in the center of it, big enough for maybe a few soldiers to fit through. This time, when you give the order to charge, some of the folks who get through the slit will continue straight ahead, but some will head left or right after they get through.

The radius of an Airy disk is 1.22 times the wavelength of the light you're interested in times the *f*-stop of the optical system. Piece of cake, eh?

Light does the same thing. Stick it through an aperture, and some will go straight ahead, but some will spread left or right. That's called diffraction.

Now then, light being wavelike (when it isn't particular), a straying ray could end up with a wave trough superimposed over a wave peak of another ray, canceling it out. The resulting interference pattern from a circular aperture would have a bright center dot, falling off to a black surround, with some other stuff surrounding that.

That bright dot is an Airy disk. Are you with me so far? The Rayleigh criterion says that if two Airy disks are at least half their diameter apart, they can be perceived as two dots, not just one. Still with me?

On account of I'm such a swell masked engineer, I've pre-done most of the math for you. I've got just one small, simple equation. The radius of an Airy disk is 1.22 times the wavelength of the light you're interested in times the *f*-stop of the optical system. Piece of cake, eh?

So now let's move into the real world. Suppose you've got a 1080i HDTV camera with 2/3-inch imagers. A 2/3-inch imager has an 11-millimeter image diagonal (on account of old camera tubes with 2/3-inch outer diameters having 11-millimeter image diagonals). Apply the 16:9 aspect ratio and the Pythagorean theorem, and you end up with an image height of around 5.4 millimeters. So 1080i HDTV's 1,080 lines have got to fit into that 5.4 millimeters. That means each line is 5 µm.

If the radius of the Airy disk of the optical system is 5 µm or less, everything's cool—at least as far as diffraction is concerned. So, let's pick blue light with a wavelength of 475 nm and an aperture of *f*/2. Stick that into the handy-dandy equation, and the Airy disk radius is just 1.159 µm. The 1,080 lines have nothing to fear from diffraction.

Now then, take the same camera, pick red light at a 630 nm wavelength and an aperture of *f*/11, and the Airy disk radius is about 8.45 µm. That means you can't get a totally clean 1,080 red lines out of the camera. If you want the full 1,080-line HDTV, you've got to be wider open than *f*/8. If you're most interested in green at maybe 510 nm, *f*/8 will just make it, but *f*/11 would be diffraction limited.

You folks who shoot indoor events at *f*/4 or less are probably filing this away in the Esoteric Knowledge file, (which is often circular and sits close by on the floor so it can be more easily filled). But give me another moment or two.

The big news at NAB2005 was 1/3-inch HDTV cameras. That's what was at the front end of HDV camcorders from JVC and Sony as well as the P2 HDTV camcorder from Panasonic.

A 1/3-inch camera has a 6-millimeter image diagonal. In 16:9 HDTV, that's about a 2.9-millimeter image height. That means the Airy disk radius has got to be about 2.7 µm or less to get all the resolution of 1,080 lines.

So let's keep that 510 nm green wavelength and try *f*/5.6. So sorry! The Airy disk radius is about 3.5 µm, so the 1,080 lines will be diffraction limited. At *f*/4 you're okay on green, but red is still a small problem.

If you take one of those new HD camcorders out to shoot in broad daylight, you're in trouble. (The JVC, with 720-line HDTV, is less affected.) If you stop down for exposure, you hit diffraction softening. If you use a shutter, you get motion judder.

What to do? Neutral-density filters are our friends! With enough neutral density, you can stop down to *f*/2.8 so even red isn't diffraction limited. With the small-format imager, you'll still probably have as much depth of field as you need, (which'll have to be the subject for a different rant).

"But, Mario, what about single-chip cameras with color filtering?"

Ah, yes. My rant on the divided-loyalty optical low-pass filter will also have to wait for a different lunar cycle.

Mario Orazio is the pseudonym of a well-known television engineer who wishes to remain anonymous. E-mail him at Mario_Orazio@imaspub.com.

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Power

CONTINUED FROM PAGE 26

MHz is perhaps 40 dB down. We might like to pass video frequencies up to, say, 6.25 MHz, but a filter that attenuates 6.75 MHz by 40 dB and is flat to 6.25 MHz will have very poor transient response due to its sharp cutoff in the frequency domain. That is, it would have large pre-shoot and overshoot. Without digressing too much, a phase linear filter will produce equal pre-shoot and overshoot.

These transients—pre-shoot and overshoot—are undesirable. They increase the voltage swing to be digitized. This applies also to a bandpass filter, which restricts the DTV signal to 5.38 MHz so it fits inside a 6 MHz channel. These pre-shoots and overshoots are fundamental to sharp cutoff filters. They are called Gibbs Phenomena after the mathematician who discovered them. They become part of the signal and cannot be removed, even by clipping.

The details of how we measured the transient peak-to-average power ratio of our DTV signal are included in a paper I wrote entitled "Measuring Peak and Average Power of Digitally Modulated Advanced Television Systems," published in the December 1992 issue of IEEE Transactions on Broadcasting. I have a few pre-prints available and will mail one upon request.

MEASUREMENT

Perhaps the most important part of that paper is a discussion of how to measure the *average* power of DTV signals. The average power is either the RMS voltage squared divided by the load impedance or the RMS current squared, multiplied by the load impedance. The classic method to measure RF power is to measure the heat produced, which is proportional to the RMS voltage or current.

Controlling all the parameters involved is tricky and time consuming. Moreover, this is an out-of-service measurement with the transmitter power being dissipated in a load resistor. However, it is a direct method and that's important, especially in testing transmitters at the factory or upon installation. Indirect in-service techniques sample the power output of the transmitter with a *precision*-directional coupler. The insertion loss of the directional coupler must be known to an accuracy better than the power measurement required to allow for calibration errors in the power measuring instrument.

This brings us to the power measuring instrument. There is the spectrum analyzer or vector spectrum analyzer, to which we will return, and there are thermal-sensing RF power meters and diode-based RF power measuring instruments.

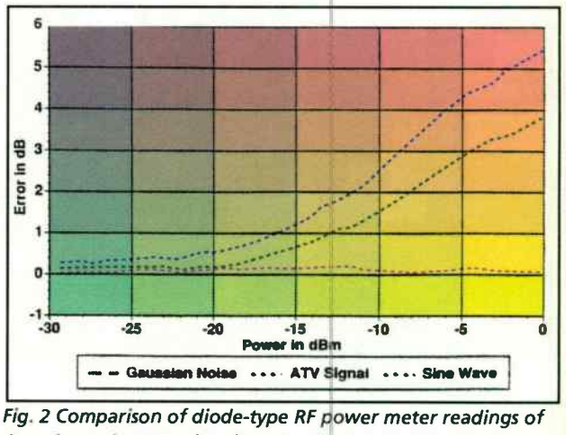

Fig. 2 Comparison of diode-type RF power meter readings of Gaussian noise, ATV signals and unmodulated sine waves.

Diode-based RF power meters are based on the fact that the square of the current through a forward-biased diode is proportional to the rectified RF power being measured. Now this is true over a certain range of currents for most diodes, but above this range, the current does *not* follow this square law. That means the diode-based instrument must be operated within its square law range of powers.

In the case of a complex signal like a DTV signal, the transient peaks must not be allowed to exceed the square law power limit of the instrument. If you do exceed the square law power range of such an instrument, it will read higher than the actual power.

Fig. 2 shows that a diode power meter was quite accurate for input powers below –20 dBm; that at –10 dBm, it read about 1.6 dB high, and at –5 dBm, it was 3 dB high, increasing to a 4 dB error at 0 dBm power input. Those measurements suggest that broadcasters should be very careful in the use of a diode power meter, because the possible errors might cause them to operate at a significantly lower ERP than is allowed.

Fig. 1 shows how we calibrated our diode power meter against a thermocouple-based RF power meter for unmodulated (sine wave) RF, DTV and white noise to produce the data reported in Fig. 2.

White noise has a much higher transient peak power than the 32 QAM or 4-VSB modulated DTV signals discussed in my 1992 paper and shown in Fig. 2.

Thermal sensing RF power meters measure the heating effect of the sampled RF power, which is typically less than a milliwatt. Modern thermal-sensing RF power meters automatically cancel out the effect of the surrounding ambient temperature, but they have an inherent noise floor. The RF power sample should be at least 26 dB above the instrument's noise floor, or you will have to calculate the effect of the instrument noise.

These instruments should not be overloaded!

A spectrum analyzer or vector spectrum analyzer can also measure the average power of DTV signals indirectly (with a calibrated directional coupler). Here again, there are certain sources of error which must be avoided. The pilot carrier of our 8-VSB modulated DTV signal is an unmodulated spectral component, so it occupies zero bandwidth. The sidebands occupy the entire 6 MHz. The resolution bandwidth of the spectrum analyzer changes the displayed spectral power density of the sidebands over a large range relative to the displayed pilot carrier.

If the resolution bandwidth is 10 kHz, and the scan time long enough to get correct results, the indicated average power is quite low compared to the indicated power with say, 500 kHz resolution bandwidth. At 500 kHz, the indicated power is low compared to the RF sample being measured. The correction for resolution bandwidth (res BW) is 10log10 res BW/5.38 MHz, so for 500 kHz res BW, the indicated power is 10.3 dB below its actual value. For a res BW of 0.010 MHz, it is down 27.3 dB from its actual value. I cite these numbers to alert you to the enormous errors possible due to the effect of the resolution bandwidth selected by the operator.

The problems don't stop here. There are other correction factors having to do with the shape factor of the instrument's resolution bandwidth filter, and yet another having to do with the internal operations of the analyzer. In short, these sources or errors must be understood for each instrument. The instruction book for your spectrum analyzer can keep you out of trouble, read it carefully. These other error sources are smaller than the effect of resolution bandwidth, but they are still significant.

All indirect RF power measurements are subject to errors. You should fully understand how your RF power meter works and understand how to calculate the station ERP from these indirect measurements, a topic reserved for a later issue. My thanks for reader Chuck Condie for raising the subject of this paper from his request for my 1992 IEEE contribution.

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

Back to Basics: Balanced And Unbalanced Audio

Back in my college days when PortaPaks were all the rage, one of the most helpful and practical resources I relied on was the "The Spaghetti City Video Manual: A Guide to Use, Repair and Maintenance," by the collective Videofreex. This book clearly explained not only the gear but all the connections, so that very quickly I was able to identify and wire all the various audio connectors—RCA, mini plug, 1/4-inch tip-sleeve or TRS (tip-ring-sleeve) plug, and the XLR connector (then often referred to as the Canon connector).

What about today's young video/audio folks? A chief engineer at a post house in New York recently shared this observation with me. The computer generation, he said, tended not to know about audio connections or connections in general, and was often mystified on how to deal with different audio connectors as well as balanced and unbalanced I/Os (inputs and outputs).

As previously discussed in this column, audio is not necessarily plug-and-play. It's not as simple as connecting a keyboard, monitor and mouse to a computer with pre-wired supplied cables.

So here's a brief overview of the basics of balanced and unbalanced audio I/O.

BASICS OF BALANCE

Balanced audio is carried on a pair of wires, neither of which is grounded; the lines being driven with equal voltage, but each with opposite polarity. It's important that the two lines have the same source impedance, but this impedance can be anything. In the days of power-matched lines, this impedance was often 600 ohms or 150 ohms, and is now 110 ohms for balanced digital audio (AES-3).

In today's analog audio world, where bridging circuits are the norm, typical source impedances (outputs) are around 50 to 60 ohms. (These sources are designed to operate into a higher impedance, up to 10,000 ohms.)

Balance by itself doesn't infer any particular type of cable topology, but in practice, to reduce susceptibility to magnetic interference, balanced audio cable is comprised of a twisted-pair for the signal.

Common terminology for those two wires is: high/low; plus/minus; noninverting/inverting.

Wire color is not always a good indicator of which is which, but for single cables having red and black wires, generally the red wire is the high side, while the black is the low.

Common connectors used for balanced audio include the XLR, 1/4-inch TRS phone plug and jack, terminal strips, and various multiconductor connectors like D-25, AMP Champ 50-pin, and Elco (or Edac).

There has been some attempt at standardizing wiring for multiconductor connectors, but there are differences between manufacturers. It's always best to check the equipment manual for wiring information.

(A reminder: Especially when using gear with multiconductor connectors—check for the pin-1 problem.)

Here are some typical balanced audio connections:

	XLR-3	XLR-3
High(+)	2	2
Low(-)	3	3
Shield (SH)	1	1

Another key property of balanced lines is that the shield is not part of the signal path. The shield is just that, provided it's properly connected at the chassis of the gear it's interconnecting.

Balanced circuits offer good rejection of noise induced equally on both wires (i.e., they offer high common mode rejection), and allow long cable runs.

Balanced circuitry used to be primarily transformer-derived, but now differential active circuitry is used in most applications, although even now sometimes only a transformer will do. Good circuit design with true balanced inputs is crucial in obtaining the benefits balance has to offer.

UNBALANCED BASICS

An unbalanced line uses one wire for the signal and another for the ground. Unlike balanced lines, unbalanced lines use the ground for signal return. In typical unbalanced cables, the ground is the cable shield.

Unbalanced lines are more susceptible to noise, and cable runs should be short. Common connectors used for unbalanced lines include RCA, 1/4-inch tip-sleeve and 1/8-inch mini (commonly found on computer sound cards). One-quarter-inch TRS plugs and jacks also can be used for unbalanced two-channel circuits.

For example, for unbalanced stereo, the tip-sleeve part of the connector is for the left channel while the ring-sleeve part is for the right. The sleeves are used to connect shields from both left and right.

The source impedance for unbalanced audio circuits tends to be higher than unbalanced, around 1,000 to 10,000 ohms, for operating into a receive impedance of typically 50,000 ohms or higher.

Typical unbalanced wiring for an RCA or 1/4-inch or mini phone TS connector:

	XLR-3	TRS
High(+)	2	T
Low(-)	3	R
Shield (SH)	1	S

Because of the advantages of balanced circuits, these tend to be found in most professional audio gear. But look carefully at monitor outputs or insert I/Os on audio consoles. Especially on low- and mid-priced consoles, the inserts may actually be unbalanced, even though the channel inputs and main outputs are balanced.

Some typical connections for inserts in consoles in this price range include TS phone jacks (separate jacks for insert sends and returns); or to save space, TRS jacks that connect the tip and ring together until a plug is inserted. The tip, as an example, could be the send, while the ring could be the return.

Unbalanced circuits are typically found in consumer gear and often in so-called prosumer or semi-pro gear. But there's still much of this gear used in broadcast and post facilities—just look at any dub rack of DVDs and VHS VCRs.

Impedance isn't the only difference between the way balanced and unbalanced audio circuits are implemented. There's a significant level difference as well. (Note that level and impedance do not define whether a circuit is unbalanced or balanced. But engineering practices have developed for each.)

For a professional audio console, a typical balanced line level output is +4 dBv (referenced to 0.775 volts) or about 1.2 volts. A typical consumer unbalanced audio device would have an output around –10 dBV (referenced to 1 volt) or 316 mV.

A consumer device feeding into

BASICS, PAGE 35

this pro console would probably not have sufficient level to drive the console's input to normal operating level. The input gain on the channel strip could be raised to maximum, but that would raise the noise as well.

Looking at this from another perspective, this pro console would easily overdrive the input of a consumer device, like a DVD recorder. Consumer devices tend not to have input attenuation to deal with this.

So connecting balanced and unbalanced circuits is not as simple as making up adapter cables, although in a pinch, this can be the solution of choice.

Common practice today is to use an active device for balanced-to-unbalanced (and vice versa) conversion. There are many brands of these interface boxes available. These interfaces take care of both the impedance and level differences between the balanced and unbalanced lines, and many have level controls for fine tweaking. Because unbalanced lines need to be kept short, install the interface box close to the equipment with the unbalanced I/Os. Keep unbalanced lines away from power cables and supplies. Especially avoid running unbalanced lines parallel or close to power lines.

Sometimes even a good interface box can't provide sufficient isolation. In that case, a good transformer will be needed. This will take care of the balanced/unbalanced dynamic and impedance conversion, but usually not the level. But when noise is an issue, a level difference could be tolerated.

As an example, the wiring for a transformer for a unbalanced-to-balanced connection:

On the primary side of the transformer (high impedance), wire the tip of an RCA or TS connector to one side of the transformer and the sleeve (shield) to the other terminal. On the secondary side (low impedance), wire one side to pin 2 of an XLR (or tip of a TRS connector) and the other side to pin 3 of an XLR (or the ring). Pin 1 of the XLR (or sleeve) should be connected to the chassis housing the transformer.

A last resort for interconnecting balanced and unbalanced equipment is the use of adapter cables. The problem with adapters is that these provide neither level nor impedance transformation.

Pre-wired adapters or cables can be purchased. Check the wiring, especially the shield. The shield can be connected in a few ways—the sleeve of the unbalanced connector to pin 1 of an XLR (or the sleeve of a TRS connector); the sleeve to pin 3 of the XLR (or ring of the TRS); the sleeve to both pins 1 and 3 of an XLR (or ring and sleeve of a TRS connector). On some equipment, one type may work better than another.

Here is another way to wire an unbalanced-to-balanced cable, using a twisted pair audio cable with red and black wires. This configuration is often preferable to those listed previously.

	RCA or phone plug	RCA or phone plug
High(+)	T	T
Shield(SH)	S	S

	RCA or TS	XLR-3
High(+)(Red)	T	2
Low(-)(Black)	S	3
Shield(SH)	N/C	1

N/C= No Connection

I hope that this overview has provided some appreciation of the importance of balanced audio circuits and how to interface balanced with the more problematic unbalanced gear.

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.

USER REPORT

Frezzi Super Sun-Gun Lights Up New York

by Rick Smosky
Freelance Cameraman

NEW YORK

As a freelance cameraman, I travel all over the world. I may go from shooting live shots in the California desert one day to taping the unveiling of a new Airbus in Toulouse, France the next. Selecting the right equipment is vital to having a successful shoot. Nowhere is this more important than in lighting equipment. Most people are familiar with HMI lights. The daylight balanced color temperature, efficient light output, high color rendering index and low heat compared to tungsten lighting, make HMIs one of the most versatile tools available.

I have been using the Frezzi SSG-200 200 W HMI since 1999 and have found it to be invaluable in terms of size, weight, durability and unsurpassed light output. While the Frezzi SSG-200 puts out nearly as much light as most other 400 W HMIs, I still run into situations where I need more "punch" from the light and I often put up a second SSG-200 to achieve the needed output. When I heard that Frezzi was developing a 400 W version of their HMI, I couldn't wait to try it.

TRAVELING LIGHT

I spend about 320 days a year traveling on various productions and news stories, so size and weight are big considerations. I was pleasantly surprised when I learned that the new Frezzi SSG-400 was only 1/2-inch longer than the SSG-200, and the weight was nearly the same. All the accessories from my existing collection of lights, such as speed rings and barn doors, fit. The new ballast is about one inch bigger in each direction, and it weighs less than one pound more.

The Frezzi 400 W HMI light Super Sun-Gun brightens Times Square on New Year's Eve.

The quality and output of the SSG-400 are truly amazing. The focusing range of the light covers any spread I have ever needed. The beam is nice and even, and is entirely usable without any added diffusion. As for the output, it is simply incredible. On a recent golf shoot in Puerto Rico, we placed the SSG-400 next to competitor's 400 W HMI, and the Frezzi was noticeably brighter; so much so that we had to move the competitor's several feet closer to the subject.

I shot for a major news channel in Times Square for the New Year's Eve festivities, and the SSG-400 really earned praises. For New Year's, crews are up on risers about 40 feet in the air. Each crew has a space about 3-by-8 feet in which to work. As you can imagine with talent, producer, sound tech and cameraman plus gear, space is at a premium. Lighting for New Year's here is always tricky. The ambient lighting is 5,600 K and very bright. There is no space to put big HMIs with their ballasts. Power is also at a premium. We were able to put up the SSG-400 HMI with a Chimera and light for three crews and still have an exposure matching the bright neon signs in Times Square. I don't know of any other light that would make this possible.

The Frezzi HMIs are not marketed as waterproof, but I have used the light outside, exposed to the elements, during multiple hurricanes without a problem. It has also never let me down while running for hours on an inverter in the sweltering heat of Death Valley. One of the most important things that a freelancer has is their reputation. I can't afford to have gear that breaks easily or won't hold up to the demands of field production.

Rick Smosky is a freelance cameraman based in New York and can be reached at rsiusa@hotmail.com.

For more information contact Frezzi at 800-345-1030 or visit www.frezzi.com.

USER REPORT

Telemetrics Streamlines Gulf Broadcast

by **Todd Graham**
Operations Manager
Gulf California Broadcast

PALM SPRINGS, CALIF.

At television facilities across the country, news departments are streamlining their production procedures and developing new workflow strategies by automating traditional manual functions with robotic systems. The result is a local newscast produced and delivered in a superior, more consistent and less expensive fashion.

At Gulf California Broadcast, we operate KESQ, NewsChannel 3, the ABC affiliate in Palm Springs, Calif., as well as KDFX, the local Fox station, and KUNA, the local Telemundo station. To help improve operational efficiency for our news programs, we've implemented Telemetrics camera robotics systems to produce six hours of news daily on the three stations.

Audio/graphics operator Chris Jaunsen of Gulf California Broadcast uses Telemetrics robotics systems for news production.

HELP WANTED

We first looked at automating the operation because of problems we were having in finding qualified part-time floor crew. Conventionally, television studios hire students from local colleges and universities as interns or part-time employees to fulfill staffing requirements, but there are no universities in Palm Springs or surrounding communities. As the breaking news leader in the Palm Springs area, we needed the flexibility to go on the air on a moment's notice without having to wait for a floor crew to assemble from geographically distant locations.

The Telemetrics system installed at KESQ resolved the issue by providing computer-controlled camera robotics that are ready to go on air 24/7. The Telemetrics setup has work flawlessly since it was implemented and has actually led to better, more consistent camera shots and less cluttered communications.

FLEXIBLE ARCHITECTURE

The Telemetrics systems products employed at Gulf California Broadcast include Televator motorized elevating pedestals, PT-LP-S2 pan-and-tilt mechanisms, CPS-ST-S control software complete with an 18-inch LCD touchscreen monitor and the CP-D-3A camera-control panel. We placed the touchscreen monitor next to the audio operator and the camera-control panel next to the technical director. There is no staff on the studio floor and communication with the anchors is through IFB. The three motorized elevating pedestals provide fluid vertical camera positioning from different perspectives, while the pan-and-tilt mechanisms mounted on the Televators further enhance camera positioning. The units also feature RS-232/422 control, preset/motion control and smooth slow/high speed "camera operator-like" movements with programmable timed presets.

The system is controlled using the advanced Telemetrics CPS-ST-S studio control system software along with the desktop CP-D-3A control panel, and the implementation has been painless. I like the fact that the Telemetrics products are reliable and easy to use. They do the job day-in and day-out. The software provides for on-air quality moves and among other features, allows the system operator to preset the key points of the trajectory as single shots (up to 16 at one time) and display live video on the monitor.

The operator can track the movement of the system on the monitor and use a mouse, joystick or touchscreen to select desired camera positions from the presets, resulting in more consistent camera shots and cleaner communication. In addition, the learning curve was relatively quick and training time was minimal.

TELEMETRICS, PAGE 39

COMPANY PROFILE

Miller Supports Cameras Worldwide

by Lauren Evoy Davis

SYDNEY, AUSTRALIA

Eight years after Bob Miller patented the fluid pan/tilt head in 1946, the doors to production opened for Miller to become an innovator in camera support products.

Since the early 1950's, the company has been developing professional fluid heads and tripods for broadcast television, professional film and digital video industries worldwide. Its distribution network includes more than 50 countries.

The company has dedicated offices in the United States and the United Kingdom with more than 60 employees based around the world.

Australian cinematographer John Leak, ACS, works on a story about the first flight to the United States by Qantas in 1959 in New York.

REVOLUTIONIZING PRODUCTION

Production for the D Head began in 1954 and the well known "F" and "LP" heads were the mainstay of television news from the late 1950s to the mid-1970s when 16mm film cameras became customary, according to Miller CEO Grant Clementson.

"The fluid head revolutionized filmmaking by giving operators the freedom to shoot more creatively and they reduced the production costs of film that previously ended up on the cutting room floor," he said.

The current Miller range focuses on lightweight, durable support for ENG camcorders, sports and studio video/film cameras as well as portable support for miniDV and DVCam camcorders.

From the analog ENG revolution to today's digital technology, customers have included networks, station affiliates, freelance cinematographers and documentary filmmakers. These customers use Miller tripods for electronic newsgathering in more than 65

MILLER, PAGE 47

MILLER CAMERA SUPPORT
216 Little Falls Road
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Tel: 973-857-8300
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www.millertripods.com

Telemetrics

CONTINUED FROM PAGE 37

The interface is simple and intuitively understandable.

ECONOMIC VALUE

KESQ NewsChannel 3 provides viewers in the area with more news than any other station in the market, and one of the original reasons for moving to an automated studio was to maintain this market leadership position by increasing its flexibility to go on the air at a moment's notice without a full floor crew. While the economic realities of television production are closely related to technology, the Telemetrics camera robotics systems have proven their worth. Without having to staff a floor crew in an automated newsroom, the company saves almost $60,000 annually. Return on investment is a subject that's talked about both internally and by our vendors, and in this instance the ROI was financial as well as needs-oriented in that it solved our problem.

Adjustments to the system have been minimal and the engineers at Telemetrics have been extremely responsive to any questions or problems that have arisen.

Todd Graham is the operations manager at Gulf California Broadcast and can be reached at tgraham@kesq.com. *The opinions expressed above are the author's alone.*

For more information contact Telemetrics at 201-848-9818, or visit www.telemetricsinc.com.

BUYERS BRIEFS

The Merlin stabilizer by **Steadicam**, a division of Tiffen, is a handheld unit designed for camcorders from palm-size to the Sony HDV camera. The 12.8-ounce stabilizer incorporates Steadicam's new patent-pending Folding-Caliper hinge that extends and retracts to balance cameras. With a camera attached, it weighs 35 ounces.

The Merlin universal dovetail plate allows rapid camera mounting and removal from the Merlin micrometer trim stage, coarse balance adjustments while affixed to the stage and positive attachment of the camera.

For more information, contact Tiffen at 631-273-2500 or visit www.tiffen.com.

The **Sachtler** Remo One remote head is designed to be used with the company's CamCrane EFP. The head weighs just 13 pounds, and can handle a payload of up to nearly 30 pounds. It is cabled for digital control via a BUS system.

The Remo One can be mounted in a standing position on tripod OB 2000, to be used for unusual angles.

Additional features include digital control via USB, telescopic frame, fast set-up and easy cabling.

For more information, contact Sachtler at 516-867-4900 or visit www.sachtler.com.

The Z-Jib arm from **Innovision Optics** permits weightless camera control from below ground level to eight feet or 11 feet overhead. Fully extended, the arm can rotate in a 6- or 22-foot circle. It's designed to support loads up to 130 pounds and accepts a camera package as well as a standard fluid head or other pan-and-tilt devices. Set-up time, from packing case to full rigging, is about 20 minutes. Innovision offers set-up training.

For more information, contact Innovision Optics at 310-453-4866, or visit www.innovision-optics.com.

USER REPORT

NY1 News Takes Vinten 8s

by Bob Wood
ENG Truck Operator
NY1 News

NEW YORK

I have been a live news truck operator/cameraman for NY1 News—a Time Warner 24-hour news channel in New York City—for a little more than a year.

NY1 covers the city's five boroughs with more than 25 full-time reporters. NY1 News signed on in the fall of 1992 from its newsroom on Manhattan's West 42nd Street. As it approached its 10th anniversary, the station moved into a new state-of-the-art facility in the historic Chelsea Market building in January 2002. With an integrated, all-digital production system and more than 600 hours of computer-based video storage, the facility represents one of the most advanced newsgathering operations in the world.

NY1 News expanded into New York City's Latino community by launching the city's first 24-hour Spanish-language news channel, NY1 Noticias, in June 2003. The channel is available on Time Warner Cable's DTV Channel 801. Also, in November 2004, NY1 launched exclusive local insertion with exclusive programming to its Bergen County and Staten Island subscribers. For six minutes per hour, viewers in those areas get local news programming and local commercial insertion serving their communities.

Bob Wood of NY1 News uses the Vinten support system.

We purchased several new Panasonic DVCPRO50 cameras; they were brand new to the market, so we needed new supports. We chose the Vision 8s by Vinten because they most suited the cameras and could be used on both tripods and lightweight pedestals in the studio. We used Vinten before, so this new kit of Vision 8s is basically replacing them.

WEATHERING WINTER

We have a couple of tripods from other manufacturers. Vinten camera support products have been around for a long time, and I used them at the previous station where I worked. We chose Vinten because of price and trustworthiness. As for the tripod itself, a lot of shooters carry these systems around on a daily basis, throwing them in the trunk where they get knocked about. I've noticed no problems with the day-to-day use—they hold up to the job. Previous experience with ground spreaders has not been great. The plastic can become brittle, especially in the snow. The northeast winters can be cold and icy, and the plastic can break easily, but the Vinten system held up fine.

All around, it's a great system. The Vision 8 has lots of great features, one of my favorites being the illuminated level bubble. I work a lot at night, and in the past it would be very awkward to use a lighter to try and level the head. This illuminated bubble is awesome.

The height ranges are very appropriate for our work; we have no need to get any more height than this. We sometimes use a two-foot-high apple box to stand on, and use the system at maximum height if we need to.

When we first got the Vision 8s, they were very user-friendly compared with other tripods that have stepped settings. I don't really use the perfect balance feature, I'm an eye-type guy. I compensate balance with my own settings and lock off if I need it to hold.

As far as the working parts, the only ones that ever would need replacing are the pan-and-tilt knobs, if I were to drop the system. They are so easily replaced, however, it really is not a problem.

We concentrate on gathering news. Recently we did a live two-hour political program that will be aired monthly. We use the Vision 8s on Vision pedestals in the studio, and the tripods outside and on the shoulder.

Bob Wood is an ENG truck operator for NY1 News and can be reached at bwood@ny1news.com. *The opinions expressed above are the author's alone.*

For more information, contact Vinten at 845-268-0100 or visit www.vinten.com.

BUYERS BRIEFS

CPC-1000 SmartPrompter teleprompting software from **Computer Prompting and Captioning** runs on desktop and notebook computers, and works with all teleprompter monitors.

The software features smooth forward and reverse scroll with unlimited scroll time. Text can come from Word, Wordperfect or any other word processing software; the software also includes fast, easy editing with a built-in word processor, providing instant access to any line of text and unlimited story points, even while prompting. CPC-1000 supports any language from Arabic to Zulu using Windows TrueType fonts. Run order of stories can easily be changed and the story list links an unlimited number of stories.

CPC-2000 teleprompting software includes CPC-1000 features and adds simultaneous captioning. All prompter text is automatically captioned as the text is read. Prerecorded and live unscripted segments are captioned manually.

For more information, contact Computer Prompting and Captioning at 800-977-6678 or visit www.cpcweb.com.

The **Cammate** Travel Series crane consists of four-foot sections packed in hard cases for frequent location shoots. The crane can be set up in 15 minutes and reconfigured in 10. Electronic head inversions can be achieved in less than 30 seconds. Weight limits range from 80 pounds at the 11-foot height using one 4-foot section, to 70 pounds at 18 feet using three sections and 40 pounds at 25 feet using five sections.

For more information, contact Cammate at 480-813-9500, or visit www.cammate.com.

The **Mirror Image** LCD Starter Series prompters were designed with tight budgets in mind. The LC-70 M composite input model for steadicams and jib arms has a 5.6-inch LCD that weighs in at 5 pounds. The LC-10M features a 10-inch SVGA color LCD system and weighs 14 pounds. The LC-150 MP has a 15-inch LCD panel that accepts high-quality VGA signals. The LC-1500 has a 15-inch color LCD prompter and a built-in TV tuner that accepts NTSC/PAL composite video signals.

For more information, contact Mirror Image at 920-232-0220, or visit www.teleprompters.com.

The **Listec** Z-Pro Mini DV Cam Prompter package consists of a 13- or 15-inch display with fold-down mirror/soft hood assembly; Windows A-6000WIN InstantEdit Prompting software and composite video scan converter; and the Cartoni Focus F-101 tripod system featuring a single pan handle and a quick-release ultralight single-stage aluminum tripod with mid-level spreader and soft carrying case.

For more information, contact Listec at 561-683-3002, or visit www.listec.com.

BUYERS BRIEFS

The **Cool-Lux** SL 3000 on-camera digital video light measures 4-inches x 4-inches x 2-inches (as a softlight) and delivers a higher quality of illuminating power than other on-camera lights using a direct light beam.

By removing the hood, the SL3000 can be converted into a 4x2-inch on-camera broad light to create a "cinema look." The compact design of the SL 3000 fits in the palm of your hand.

Accessories include Quick Flip Frame for Gel/Filters, Gel pack, AC dimmer, egg crate and shoe adapter.

For more information, contact Cool-Lux at 800-223-2589 or visit http://cool-lux.com.

The **Shotoku** TP-80 is four-stage pneumatic pedestal that employs half of the pressure used in conventional air pedestals.

The balanced, maintenance-free unit has a maximum height of 59 inches; a minimum height of 19 inches; maximum carriage width of 36 inches; and a minimum carriage width of 33 inches.

The maximum load capacity is 229 pounds; the mass weight of the unit itself is 412 pounds.

For more information, contact Shotoku at 866-746-8658, or visit www.shotoku.tv.

The **Videssence** Shooter Kit features the MT-LOS-K folding kit stand, a 5/8-inch mounting adapter, 16-foot power cord, a barn door, gel frame and two Shooter series fixtures, one using a tungsten color 57 W Biax Q/E lamp and the other, a 50 W mini halogen Shadowcaster. The kit comes in its own soft padded case made of PVC-backed polyester, which measures 30-by-13-by-12 inches and weigh in at 30 pounds fully loaded.

For more information, contact Videssence at 626-579-0943, or visit www.videssence.tv.

MagicScroll teleprompting software from **Magic Teleprompting** comes in Windows and Macintosh versions and features point-and-click controls, multiple open scripts, line numbering and cut-and-paste text capabilities. It accommodates all languages and fonts in True Type and Adobe, with font size adjustable up to 256 points.

Text can also be highlighted in bold, italics, underlined, patterned or colored. Scrolling is operated by the Magic Scroll hand controller, a mouse, trackball or trackpad.

For more information, contact Magic Teleprompting at 800-646-6244, or visit www.magicscroll.com.

The new 4Bank Select DMX Ballast from **Kino Flo** powers 15-inch, two-foot and four-foot lamps with the added ability to control fixtures or individual lamps from a DMX dimmer board. The new DMX Ballast can control arrays of fixtures or be used with Kino Flo splitters when building individual lamps into sets. Each 4Bank grabs five addresses (addresses 1-4 for lamps and address 5 for the two-foot/four-foot settings).

The new 4Bank Mega DMX Ballast powers six-foot and eight-foot lamps the same as the Select model, with five DMX addresses to control fixtures and individual lamps.

For more information, contact Kino Flo at 818-767-6528 or visit www.kinoflo.com.

PRODUCTS & SERVICES SHOWCASE

PRODUCTS & SERVICES SHOWCASE

USER REPORT

Cartoni Carries Heavyweights for Mira

by **Rick Hayes**
Chief Engineer
Mira Mobile Television

PORTLAND, ORE.

Mira Mobile Television provides equipment for such notable companies as Fox Sports Northwest, ESPN, CBS and Major League Baseball, as well as college sports and other entertainment events. Our fleet consists of five mobile units based in Portland, Ore. and Vancouver, B.C., all equipped to handle HD, SD and analog broadcasts. We have provided high-end video production services and equipment for more than two decades, and have earned a reputation for quality and dependability.

GETTING BALANCE, SUPPORT

In today's competitive environment, it's important to offer the best performing equipment available. Our clients are directly involved in evaluating equipment. The decision to purchase Cartoni equipment is a prime example of that process. I asked my sports clients to evaluate various tripod systems, and during the final decision process, recommended a tripod system that would be added to Mira Mobile's M-5 mobile unit.

These guys are picky about the type of head they will use. They require a head with good balance that does not slip. The consensus was that the Omega had the best balance and zero pan-slip. Mira Mobile Television recently added Cartoni tripods with Omega heads to the equipment list, because we know that even the most expensive broadcast cameras won't get professional results if the tripod head slips.

The Cartoni Omega is perfect for our studio broadcast cameras, and has a compact fluid head as well as an advanced fluid-damping module in pan-and-tilt modes. The Omega counterbalance mechanism gives a perfect response throughout the tilt range. All settings are easy to adjust accurately with the digital readout feature. The fine-tuning crank placed underneath the rear section of the sliding plate achieves the precise center of gravity of the camera.

The Cartoni tripod supports a camera at Safeco Field in Seattle.

The newer, longer lenses used for sports make having a tripod with a good pan-and-tilt fluid head critical. At Mira Mobile, we've seen tripods evolve from mechanical to fluid-type heads. Cartoni offers the best of both worlds—a balanced combination of mechanical and fluid in one system. Our clients are very happy with the Cartoni Omega products and we plan to continue using them.

Rick Hayes is the chief engineer at Mira Mobile Television and can be reached at rhayes@miramobile.com. *The opinions expressed above are the author's alone.*

For more information, contact Cartoni at 818-760-8240 or visit www.cartoni.com.

BUYERS BRIEFS

Microdolly Hollywood offers a special handle for its remote pan-and-tilt power head that allows for precise handling of pan-and-tilt camera movements similar to those of a tripod head. The 1/2-pound handle installs in seconds and works with the remote power head mounted to the Microdolly jib arm—without having to disconnect the remote controls. The handle has a comfort grip to ensure smooth and setady camera movement.

For more information, contact Microdolly Hollywood at 818-845-8383, or visit www.microdolly.com.

The **Fujinon** EPT-7G-H2A remote pan-and-tilt system is designed for the Sony HDC-X300 half-inch HD camera. When used with the Fujinon EOP-102J-60B four-head controller, it aims, zooms and focuses the camera, but remotely controls the camera's black-and-white balance, shutter speed, gain adjustment and color bars.

The EPT-7G-H2A includes an RS-487 interface and a pan range of 300 degrees. It pans at 25 degrees a second and tilts at 20 degrees a second. Camera positions can be preset and stored before production begins, but all positions and the shot list can be adjusted as needed once production begins. It features a load capacity of 4 kg/8.8 pounds and a DC servo drive system.

The EOP-102-J-60 provides a variable-speed joystick, rocker switch, and potentiometer as well as close, open, auto, and remote iris controls. It comes with a 32-shot per head memory and allows users to control camera on/off positions, shutter speed, gain adjust, color bar, and black and white levels.

For more information, contact Fujinon at 973-633-5600 or visit www.fujinon.com.

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PRODUCTS & SERVICES SHOWCASE

USER REPORT

Manfrotto Steers Project Music Video

by Taylor Gahm
Independent Director/DP

LOS ANGELES

When my agent told me that recording artists Project 86 wanted me to shoot the documentary DVD for their upcoming album, I was elated. As a music video director, I am accustomed to having plenty of time and resources to prepare each shot I take. I realized that this DVD would require a very different approach, allowing less shot prep, gear and fewer crew members. I would have only one opportunity to get the shots right—every time.

I attended NAB2005 for some inspiration for the project. It was on the flight to Las Vegas that I caught my first glimpse of the Manfrotto FigRig in a magazine. After reading the article, I knew exactly where I would be heading once I got to the Las Vegas Convention Center.

Upon arriving, I made my way to test the FigRig. I was hooked! Shaped like a wheel and extremely lightweight, it offered the shake-free stability and video quality of a steadicam with the flexibility of handheld shooting.

With my new FigRig in hand, I returned to Los Angeles to begin principle photography on the DVD. I have found that the limitations imposed by airline security usually make traveling with video equipment difficult, but I simply clamped the FigRig onto my camera case and carried it onto the plane with no problems during my security check (apart from a few wide-eyed security officers asking why I brought the steering wheel).

Director Taylor Gahm uses the FigRig to shoot a documentary for rock band Project 86's upcoming album.

BEYOND THE LIMITS

Over the next two months, I shot in practice rooms, studios, warehouses, clubs, cars, tour buses and on boats. With the FigRig, digital filmmakers can take their DV cameras beyond the limits of traditional systems, such as shoulder- or body-mounted supports, which can be expensive, obtrusive and can limit the creativity of the shooter.

Lightweight and manageable, the FigRig allowed me to get diverse shots quickly, which is imperative when shooting a live band.

With no straps or harnesses attached to the FigRig, I experienced heightened maneuvering abilities during shooting, allowing me to quickly and easily capture everything from low to high angles.

I actually did a couple of 360-degree camera flips, which I guarantee has never been done pre-FigRig! I also utilized another unique capability of the FigRig by mounting my audio equipment directly onto the frame.

For an easy-to-use, versatile and high-quality camera support system, I would absolutely recommend the Manfrotto FigRig, and I look forward to working with it more in the future.

Taylor Gahm is an award-winning director/DP and can be reached at mail@taylorgame.com.

For more information contact Bogen Imaging, on behalf of Manfrotto at 201-818-9500, or visit www.manfrotto.com.

Miller

CONTINUED FROM PAGE 38

countries. The BBC, Japan's NHK, TBS Tokyo, TV Asahi, China's CCTV, Australia's Channel 7 and ABC, South Africa's SABC and MNet, India's SaharaTV, France's TV3, NBC in the United States and Mexico's TV Azteca, among others, all depend on Miller for camera support.

VARIETY, DURABILITY

Some of the new Miller products include the Sprinter ENG series, available in carbon fiber or alloy tubing, in 2-stage or single stage. The weight varies from 5.5 pounds to 7.7 pounds and has a carrying capacity of nearly 100 pounds. The 100mm bowl has increased the torsional rigidity of the tripod to ensure stable shooting, even under wind conditions or telephoto shooting, according to Clementson.

The DV camera support line includes the Solo DV, a lightweight 75mm carbon fiber telescoping tripod. Compatible with most industry-standard ball-leveling fluid heads, the Solo DV uses leg angle locking to eliminate the spreader. This design allows the tripod to exceed the height range of most other 2-stage tripods on the market, Clementson said.

Miller also has launched a 100mm ENG tripod, the Solo VJ designed for 10 to 40-pound camcorders.For the sports environment, Miller offers its 1441 heavy duty support system—its strongest and lightest carbon fiber support package. It handles payloads of 22 pounds to 55 pounds. The 1441 system combines the Miller flagship 7+7 Arrow HD fluid head with its 25mm carbon-tubed heavy duty 2-stage trip and adjustable mid-level spreader for quick repositioning or shooting on uneven surfaces.

Looking towards the future, the company continues to advance the design of fluid pan and tilt heads to meet the needs and environmental demands of cinematographers, news gatherers and videographers. ■

USER REPORT

Lowel Brightens Media Production

by Don Bachmeier
Owner
Media Productions

SOUTH FARGO, N.D.

As a director of photography, I've been involved professionally with imaging in film, video and stills (including making a camera out of an oatmeal canister) since 1972. Corporate events coverage was added when Media Productions acquired the film company I worked for. When you're from North Dakota, you have to do everything. Although the company is based in Fargo, we've worked all over the United States and in several countries.

DP Don Bachmeier, with a Lowel Caselite 4

WHITE LIGHT, WHITE HEAT

I've used Lowel Lighting equipment for more than 30 years, so when I started using fluorescents in production, it was a comfortable decision. I noticed the fluorescent light we often shot in tended more and more toward daylight color temperature. While there is usually enough light, it is mostly straight down and often unkind to human faces.

If you wanted to fill in the eyes or add some modeling and direction, you might have had to convert at least one 1K tungsten light with CTB, but ended up with only the equivalent of 250 watts of output with all the amperage and heat of 1,000 watts.

I worry about drawing too much power since it's hard to know the total load on a circuit. You don't want to be responsible for lost work on one or more computers. This is especially tricky in cubicle clusters. I blew a breaker in Bismarck, N.D. once that set off an alarm in an office in Salt Lake City, so I err on the side of caution.

I started with a Lowel Caselite4 and a Caselite2. Self-contained and quickly deployable, I lamped them for daylight, although tungsten compatibles are also available. Switching on bulbs individually makes intensity adjustments easy when you don't have the room to maneuver the light. I once reversed the barndoors on the Caselite2 so the black side was inward, and cut a nice slash of light across the picture on a back wall. I didn't think you could do that with fluorescent.

I've also tried a Lowel Fluo-Tec 850DM and a Fluo-Tec 650DM. These studio fixtures were not intended for location use, but they are very good for some situations, especially with the IR DMX remote controller accessory. Imagine tweaking the lights in your setup from the camera without rigging a wired dimmer panel. Or imagine moving the camera for a reverse angle and simply adjusting levels so what was the backlight becomes the keylight for the new angle.

With DMX control, you could add small dimmers for the hair light and practical lamps, and adjust them via the controller. You also get a wide soft-aperture fixture that is only five inches thick instead of traditional soft-sources that can easily extend two to three feet into a room.

Using 55 W bulbs, the fixtures draw between 110 and 440 watts. Even the smallest puts out nearly as much usable daylight as a converted tungsten 1K, but with a far smaller demand on the circuit. Two other advantages—the low heat generated by fluorescents, and the fact that digital cameras seem to really like the high color rendering index.

Don Bachmeier is the owner of Media Productions and can be reached at don@mproductions.net.

For more information, contact Lowel at 800-334-3426 or visit www.lowel.com.

BUYERS BRIEFS

The **Audio Video Design** studio camMount prompter line is used with miniDV, ENG or studio configuration cameras. The 30-pound AV20CV studio camera prompter uses a 20-inch color LCD monitor that accepts composite loopthrough PAL, NTSC, SECAM worldwide video standards. An aluminum trapezoid studio hood is standard and a field hood is available.

The prompter offers universal switching 100-250 V AC power supply and also accepts 12 V regulated DC in from the operator's battery source.

For more information, contact Audio Video Design at 800-749-7266 or visit www.avd-prompt.com.

The Go-Prompt 12 is a self-contained prompting device from **Autoscript** that can function without an additional PC or laptop.

The high-brightness unit has a USB Flash drive for file import and incorporates a wireless control for file selection and text speed.

Go-Prompt 12 accepts Word, RTF and Text-only files, and all languages are supported through Unicode. Presenter settings and font sizes are configurable through an on-screen menu. The unit also has a video output for a second prompter, with an option to add the Autoscript 2-inch preview screen. It runs on 12 V DC or 100/240 AC.

For more information, call 203-338-8356, or visit www.autoscript.tv.

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Skip Pizzi is a renowned expert in digital audio and co-chair of the NRSC Surround Sound Audio Task Group, as well as a Contributing Editor to Radio World. He is also a former technical training manager for broadcast technology.

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USER REPORT

K2 Prompts On the Go With Telescript

by Katie Entwistle
Co-owner/Teleprompter Operator
K2 Productions

ATLANTA

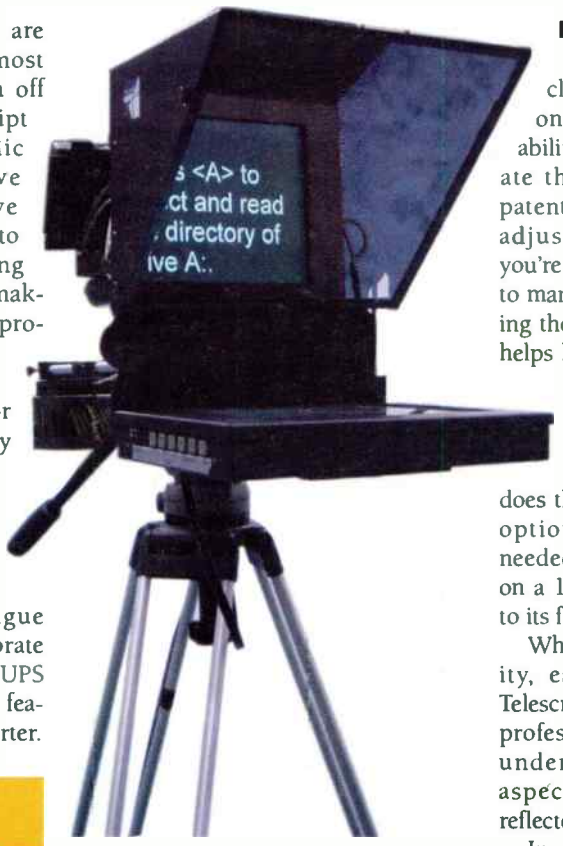
As co-owner of a busy production company, I have seen all types of camera presentations. Some speakers are naturally gifted and others have mastered the craft through experience. Many people find speaking into a camera or to an audience daunting.

To help these sometimes reluctant orators gain their composure and sound like the presidents they often are, our company owns and uses professional prompting systems from Telescript. The results are powerful, allowing the speaker to move at his or her own pace, look directly at the audience and with a little practice, sound like they are talking naturally instead of reading from a script.

Not all prompting solutions are created equal, and even the most practiced talent can be thrown off by a fuzzy image. Our Telescript on-camera systems and public speaking systems—which we have used for more than five years—provide bright and easy to read images at distances ranging from two to 25 feet. Although making the talent look and sound professional is of utmost importance; quality, ease of use, dependability and portability for the operator are our primary concerns.

DIVERSE SHOOTS

K2's projects range from broadcast field applications such as NASCAR and Major League Baseball on Fox Sports to corporate video shoots with Home Depot, UPS and Coca-Cola, and productions featuring former President Jimmy Carter.



The Telescript on-camera system

In every instance, our Telescript on-camera teleprompter equipment has excelled in its performance. Additionally, because our services are primarily provided on-site, the Telescript systems pack into one small case, making travel easier. Once we're on-site, the equipment is easy to adapt on any camera or jib with the Telescript QuickMount system and sliding-mount assembly. This device keeps the components together as one piece, making setup and teardown easier than ever before.

EASY TO READ

During production, our clients often comment positively on the teleprompter's high readability, and as an operator, I appreciate the function of the Telescript patented antiglare glass and highly adjustable contrast levels. When you're on location, it's not always easy to manage lighting conditions, so having these kinds of extra features really helps keep us in control and maintain a studio-like image quality. In addition, text changes on-the-fly are more easily accommodated because the hardware does the image reversal and the input options provide crisp images. If needed, the system can be operated on a 12 V battery in the field, adding to its flexibility.

When it comes to quality, reliability, ease of use and portability, Telescript prompting equipment is the professional's choice. The company understands the mission-critical aspects of production, which is reflected in the product engineering.

In addition to the product attributes, the company and staff are extremely professional and helpful. Its customer service is very responsive, and I can attest to this by citing numerous examples from our own experience, including Telescript sending us additional equipment with less than 24 hours notice.

Katie Entwistle is the co-owner/teleprompter operator for K2 Productions and can be reached at katie@k2-productions.com.

For more information, contact Telescript at 888-767-6713 or visit www.telescript.com.

BUYERS BRIEF

Weighing 8.2 pounds the 1030HD fluid head by **OConnor Engineering** can counterbalance cameras weighing up to 39 pounds through a full +/– 90-degree tilt range.

Another support system, the 16-pound 2060HD can balance a camera weighing up to 83 pounds.

Operators can configure the 1030HD with or without cine-style accessories, depending on the camera configuration and can be counterbalanced either way.

For more information, contact OConnor Engineering at 714-979-3993 or visit www.ocon.com.

Camera Support

K5600 Lighting

10434 Burbank Blvd.
North Hollywood, Calif. 91601

The following is a compilation of opinions solicited from users of the month's featured product, as well as general specifications and other pertinent information.

KEY FEATURES

- Reliability
- Versatility
- Compact

USER	René Vara Sync Pulse 626-399-2639	Bob Abrahamsen West Net Video 281-852-7883	Jeff Freeman Broadcast images 760-746-7999	Sandy Spooner Spooner Productions 818-905-1092
WHAT MODEL(S) DO YOU HAVE?	Joker Bug 200, 400, 800	Joker Bug 200, 400, 800	Joker Bug 200, 400, 800	Joker Bug 200, 400, 800, 1200
HOW IS IT USED?	ENG live shots, accent light	Magazine shows, space shuttle mock-up lighting	Live shots, lighting up background	Match daylight or on live shots
HAS IT PERFORMED AS EXPECTED?	Yes	Outstanding	Yes, performs beyond expectations	Yes
WHAT FEATURES DO YDU LIKE THE MDST?	Durability	Durability, versatile with different lenses and chimera softbox	Lower power consumption, compact	Great range of power
WHAT FEATURES DO YDU LIKE THE LEAST?	None	None	Usually needs a lens in front of it except for long distances	Won't take a heavy beating
HOW LDNG HAS IT BEEN IN SERVICE?	Seven years	14 years	18 years	Six years
HAVE YOU HAD ANY EXCESSIVE MAINTENANCE PRDBLEMS?	One heating issue that was resolved immediately	None	None	Just wear and tear
HDW WOULD YOU RATE THE MANUFACTURER'S SERVICE/SUPPORT?	Great:quick turnaround	Very good.	Very high	Very good about getting problems fixed
WHERE WAS THE EQUIPMENT OBTAINED?	Band Pro	ImageWare	Band Pro	Bought from K5600 and Band Pro
WHAT WAS THE DECIDING FACTOR FDR YOUR PURCHASE?	Cost	First HMI was not a Joker Bug and needed better reliability	Reliability and performance	Lightweight and able to fit in small areas

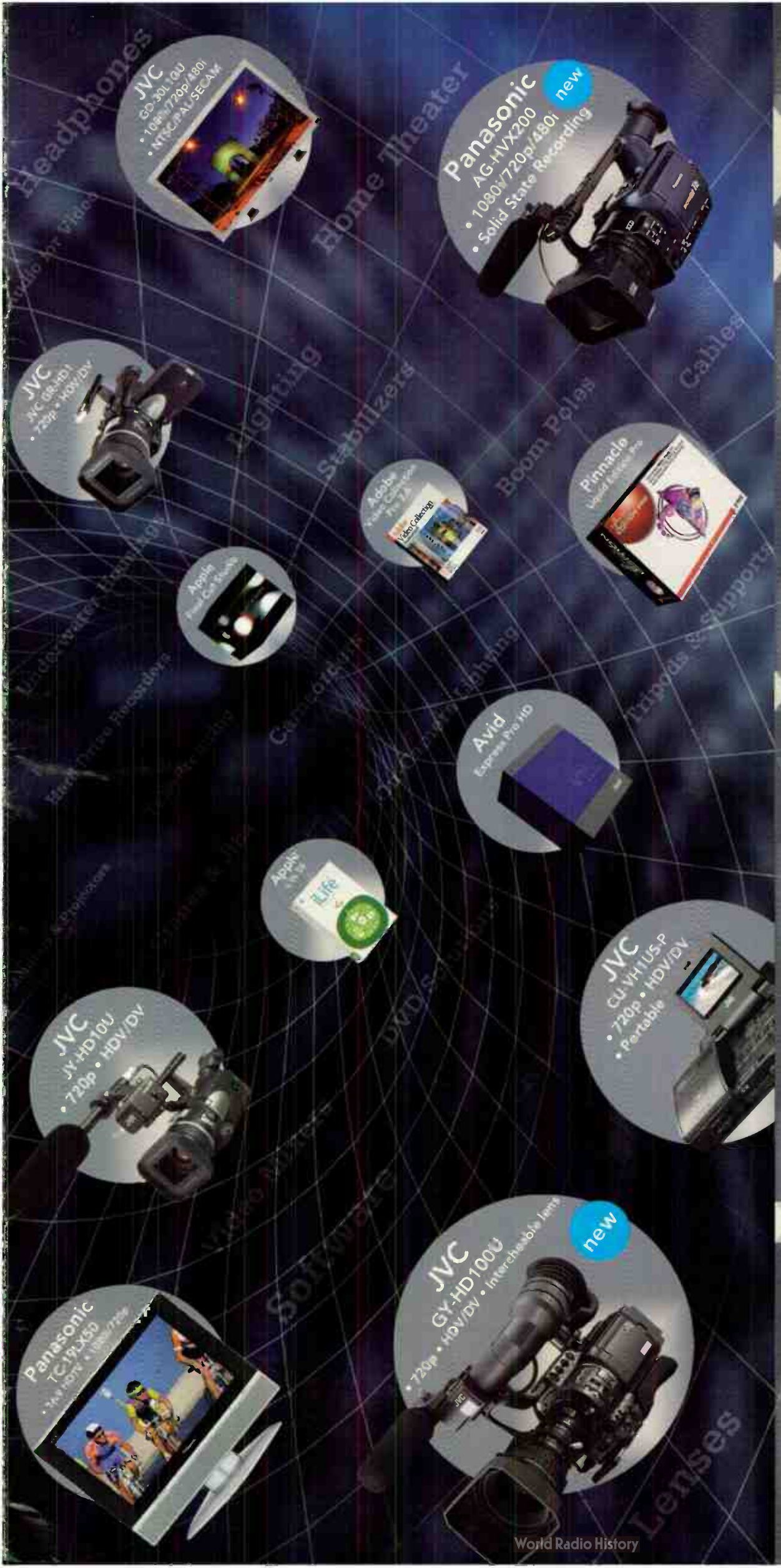
For more information, contact K5600 Lighting at 800-662-5756 or visit www.k5600.com.

REFERENCE GUIDE

The Reference Guide is a selected sampling of current products. Specifications and prices are supplied by the manufacturer and are subject to change without notice.

SHIPPING AND CARRYING CASES

MANUFACTURER	MODEL	TYPE OF CASES	DELIVERY TIME FOR CASES	DELIVERY TIME FOR CONTAINERS	CONSTRUCTION TYPES	SERVICES AVAILABLE	CASE/CONTAINER OPTIONS/FEATURES	PRICE
A&J Cases 800-537-4000 *www.ajcases.com*	DI, DI Lite, XP container	ATA shipping, rack, shock-mount cases; containers	10 working days or less	Varies by size and type	Plywood, fiberglass ABS, laminated heavy-duty rotomolded plastic	Design assistance, CAD, custom interiors	Retractable handle, wheels, keylocks, casters	Call for price
Ameripack 800-456-7963 *www.ameripack.com*	Ameripack US Rock Shocks	Shock rack mount	Many in stock, 2 weeks	Many in stock, to 2 weeks	Polyethylene, frame is designed with threaded steel rails	Custom applications, addtl or stiffer shock mounts	Standard 24-inch rack, in 10U, 12U, 14U and 16U rack units.	$115 $1,400
Anvil Cases 800-359-2684 *www.anvilcase.com*	ATA, Forge, MACC, XLT-1, Anvil Iron	Flight and transport cases	Quick ship stock, custom stock, 2-3 weeks built to order	N/A	ATA-style, metal, abs, plastic, aluminum, fiberglass	Refurbishing and retro-fitting	Recessed hardware, speedster handles, MICS (table leg system) locking mechanisms	Call for price
Bogen Imaging 201-818-9500 *www.bogenimaging.us*	Amablia AM LG5137 Kata EXO-33	Kata: full line	In stock	In stock 30 days	Aluminum Dupont Cordura	Lifetime warranty Five-year warranty	Interlocking rubber gaskets; fits DV camcorders	$450 $155
Calzone Case 800-243-5152 *www.calzonecase.com*	Escort, Titan, XLT-1, Pro-line, Convoy	Carrying, shipping for flight and transport	Quick ship stock, custom stock, 2-3 weeks for built-to-order	N/A	ATA-style, metal, abs, aluminum, fiberglass and plastic cases	Refurbishing and retro-fitting	Recessed hardware, EZ-haul handles, case-in-case, locking mechanisms, pneumatic lifts	Call for price
Hardigg Cases 800-542-7344 *www.hardigg.com*	Single-lid and rackmount; Storm Case	Electronic equipment, cost-effective fly packs	7-10 days; many in stock	Same for transit containers	Rotationally molded plastic	Custom design and engineering services	Removable casters, DRVs, ATA, edge casters, workstation setups, keyboard trays	Call for price
Innerspace Cases 800-806-7689 *www.innerspacecases.com*	Custom	Flight, transport-custom	5-10 days for containers	N/A	Plywood, fiberglass, abs, plastic	Design, engraving, custom services	High-tech construction, special wheels, handles interior features	Call for price
Portabrace 802-442-8171 *www.portabrace.com*	The Carry-on	Carry-on camera cases	In stock: to 10 days	N/A	1,000 denier Cordura, plastic frame	Custom design services	Designed to carry onto most airplanes	Carry-on: $369
Petrol 818-841-9655 *www.petrolbags.com*	U-Bag for broadcast	Carry-on bag cameras	In stock	N/A	Cordura outside with multi-laminate hard panel interior	Custom design services	Wide U-shaped opening, accessory pockets, padded shoulder strap, interlocking carrying handle	$319 list
Nelson Case Corp. 800-335-7273 *www.nelsoncasecorp.com*	Case for plasma flat panel 15- to 62-inch units	Shipping, storage and display	10 working days or less, plus ship time	10 days on all collapsible nest units	New European black birch structure; custom with traditional and new case hardware; recessed hardware	Custom design with input from customer	Special casters, special skids, special foam inserts, lockable cases	Call for price
Porter Case 800-356-8348 *www.portercase.com*	Stowaway 20-20 LWF	ATA shipping case wheeled with extension handle	In stock ships next day	6-8 weeks	ATA style HDPE plastic aluminum valance, recessed steel handles	Custom design and engineering services	BB wheels, recessed hardware, retractable handles, case on case locking	$249
SBC Case Industries 800-667-8979 *www.sbccase.com*	Racks and cases for all applications	ATA, shock isolation, camera	In stock ships same or next day; 10 days for custom	N/A	Double-edge aluminum ATA cases, padded bags and welded aluminum cases	Design, die-cut foam, vacuum forming, TIG/MIG welds; CNC router	Pull-out handle, wheels; 1/2-, 3/8-, 1/4-inch ABS laminate construction, 1/4-inch Blacklite	Call for price
Tamrac 818-407-9500 *www.tamrac.com*	2249	Professional quality case for large camcorders	24 to 48 hours	N/A	PowerGrid Cordura, holds XL-2 with Canon MA-100 attached, meets military black EDP specs	Five-year warranty for normal wear and tear, water-resistant	Zip-lock pockets, internal organizer pockets, heavy-duty coil zips, leather shoulder strap	$289.95
Thermodyne Cases 909-923-9945 *www.thermodyne-online.com*	SlimLine, Shockstop, Rack-Pack	ATA shipping, MILSPEC, rackmount	24 hours: stock 7-10 days: custom	Call	Rugged military-grade polyethylene, custom trim	More than 450 sizes, 2RU to 25 RU racks, custom design	Lightweight, military-proven durability, ATA-compliant	Call for price
Viking Cases 800-237-8560 *www.vikingcases.com*	Vikilite	Lightweight ATA shipping cases	Call	Call	ATA construction, recessed handles, hardware, double-edge aluminum extrusions	Custom and standard designs available	Tilt 'n Go cases with recessed handles available in standard or custom designs	Call for price



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HDV is a new video recording format that enables **High Definition** video to be recorded onto MiniDV tapes. This revolutionary technology provides almost **6 times the picture information** of standard definition, while keeping the cameras **small & affordable**. Just like standard DV, the HDV signal can be transferred to your computer editing system via Firewire. This keeps the HDV edit workflow easy, familiar and manageable.

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AUDIO PRODUCTION

Want to Sell

Mackie 1604 VLZ Pro, new, too low to quote; Mackie 1604 VLZ, used, $625; Sony MXP-744, BO; Bittree & ADC audio & video patch panels from $300; Stantron 45RU racks from $300; Emcor Series 10 40RU racks from $300; Digidesign 888, $650; Sony PCM7040 DAT, $2990; Crown D75 & D150 amps, low $$; DPS stereo audio sync, $1000; Panasonic SV-3800 DAT, $500; Genelec 1030a studio monitor, pair, $1150; HHB Circle 5A studio monitors, pair, $950; Wohler Amp 1-A, $375; Neumann U87 Ai studio mic, $1995; AKG C 414 B ULS mic, $1450. 818-788-4700 or www.tvprogear.com.

CAMERAS

Want to Sell

Panasonic AJ-HDC20a hi-def DVCPRO w/lens, $38500; Sony DXC-D30 studio config, $8500;Panasonic AJ-D900WAP DVCPRO P NTSC camera w/lens, $9995. 818-788-4700 or www.tvprogear.com.

(4) Panasonic AG-EZ-1U 1/3" 3-CCD Mini DV, each unit incl Soft Bag, wide-angle lens, filter kit, 2 chargers, 3 used batts, 3 new batts in box & XLR Pro Adaptor, all units in gd wrkg cond, $550 each or $2000/pkg. 408-554-4920 or cgower@scu.edu.

Hitachi C-1 CCD camera w/hard case, BO. Terry, 508-574-4141.

Sony UVW 100B Beta SP camera, 3 batts/chrgr, 2 cases & AC adapter, $2100. Glen, 208-735-1970.

CAMERA ACCESSORIES

Want to Sell

Cartoni Beta head & single stage sticks, $1850; Vinten Pro-Ped, $8000. 818-788-4700 or www.tvprogear.com.

CHAPTERS

IDX 400 batt chrgr w/5 batts; 8' rack, open back, BO. Terry, 509-574-4141.

EDITING EQUIPMENT

Want to Sell

Avid Adrenaline Assurance, new, $21500; Avid Symphony version 3.5 on IBM Intellistation, $19500. 818-788-4700 or www.tvprogear.com.

Complete Avid Express System version 2.1 on MAC 9600/300 w/192 MBs of RAM & 4 GIG system drive running O/S 8, 1x20 Vision Master monitor, 1x17 Vision Master monitor, 18 GIG external media drivers (2), external Plextor CD burner w/caddy, incl additional software files such as Photoshop 5.5, After FX 3.1 & more, BO. Terry, 509-574-4141.

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Focus Optics. Service and repair of broadcast video lens. Fujinon, Canon, Nikon, Angenieux, etc. **We have the fastest turnaround in the country.** We also repair lens that have bad inpact damage. **Call Stuart at 800-234-lens or www.focusoptics.com.**

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Want to Sell

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Want to Sell

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MONITORS

Want to Sell

Sony PVM20L5, B-Stock, $2495; Sony PVM-20M4U, $1750; Sony PVM14L5, B-Stock, $1495; Sony PVM1341, $500; Sony PVM8042Q, $400; Sony PVM8044Q, $450; Sony PVM8045Q, $500. 818-788-4700 or www.tvprogear.com.

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TV Pro Gear purchased the television and radio production assets of a large financial news network in New York City. We moved this equipment to our New York City warehouse for immediate sale at drastically reduced prices.

The Joseph Finn Company will conduct an auction on behalf of TV Pro Gear August 17, 2005 in New York City. All items will be sold by catalog from the Holiday Inn, located at 440 West 57th Street (between 9th & 10th).

Inspection and preview of equipment will be held at TV Pro Gear's warehouse, 540 West 36th Street, 7th floor, Monday August 15 and Tuesday August 16, 9AM-5PM. Visit **www.josephfinn.com** for detailed information.

Sony ❖ Panasonic ❖ Leitch ❖ DPS ❖ Kramer ❖ Sierra ❖ Videotek ❖ Leader ❖ Chyron ❖ KinoFlo ❖ Fujinon ❖ Sachtler ❖ Sigma Snell & Wilcox ❖ BTS/Philips ❖ Mackie ❖ RTS ❖ Clear-Com ❖ Wohler ❖ Marshall ❖ 360 Systems ❖ Aphex ❖ Shure ❖ Gentner Rane ❖ Tannoy ❖ Abekas ❖ Ultimatte ❖ Balcar ❖ Lowell ❖ NEC ❖ Strand ❖ Desisti ❖ DiscreetLogic ❖ Radamec ❖ DBX ❖ Yamaha FastForward ❖ Crown ❖ Denon ❖ Fostex ❖ Apogee ❖ JBL ❖ EV ❖ Roland ❖ Sennheiser ❖ Orban ❖ Titus ❖ Tascam ❖ ETC ❖ Polycom

You may view the items to be auctioned and get more details on-line at **www.josephfinn.com.** If you are unable to attend in person, there will be simultaneous webcast of the auction.

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Want to Sell

Leitch FR-684 dual PS 2RU Frame, $295; Leitch FR-884 dual PS 2RU frame, $295; Leitch Mix-7001 multi-function digital frame, $400; Grass Valley Series 8900 Frames w/redundant power supply, $600; GVG 8501 video DA's, $125; GVG 8551 audio DA's, $100; Sony BVX-D10/BVR-11, $3990; Leitch DPS-290, $1200; Leitch DPS-465, $2950; Leitch DPS-470, $3250; Leitch DPS-475, $3750. 818-788-4700 or www.tvprogear.com.

SWITCHERS

Want to Sell

Echolab Prima MSV6 10-input switcher w/chroma key, $12500; Grass Valley 200-2, $5000; Miranda Digipath 16x16 SDI router w/remote panel, $3500; Sierra Video 16x16 composite video router, $1500; Leitch 4x4 MB routers, $175; GVG Ten X, $600; Kramer 5x4 A/V switchers, new, $475. 818-788-4700 or www.tvprogear.com.

TEST EQUIPMENT

Want to Sell

Leader LV-5700 SDI waveform/Vector, $10500; Videotek TVM-821D SDI waveform/vector, $3995; Tektronix WFM601M SDI waveform, $5500; Tektronix WFM601A SDI waveform, $4000; Tektronix WFM601 SDI waveform, $3990; Tektronix 1731D PAL SDI vectorscope, $2000; Tektronix 764 digital audio monitor, $2000; Tektronix 760A audio monitor, $1000; Videotek VTM-100 on screen monitor, $1850. 818-788-4700 or www.tvprogear.com.

TEST & MEASUREMENT

TRANSMITTERS/ EXCITERS

Want to Sell

TRANSMITTERS-Used TV transmitters from Harris, Acrodyne, RCA, Emcee, TTC. Antennas, microwave, feedline, etc. See transmitterwarehouse.com or call 954-792-7207.

Want to Buy

Ohio Broadcaster looking for used two-tube 60kw NTSC transmitter, 1990 or newer. Contact Rob, 614-416-6080 x.132."

TRANSMITTERS (Cont.)

SERVICES

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Satellite Technology Systems is seeking an experienced Satellite Truck/SNG operator to run one of our three Midwest based satellite trucks.Competitive pay (average 75k) plus 4 weeks vacation and medical benefits. Recuires Illinois Class C drivers license, or Class B CDL. C-Band, ENG, or A2 experience a big plus. Please email your letter and resume to sts@mc.net .

VTRs/VCRs/RECORDING MEDIA

Want to Sell

Sony BVU-150 (2) 3/4" field decks w/PortaBrace case; Sony BVH-3100 1" bdct video rcdr; Sony extender board for BVU-3100 (engineering); all BO. Terry, 509-574-4141.

Sony UVW-1800, lw hrs $5000; Sony PVW-2800, from $4500; Sony BVW-70 from $4500; Sony BVW-60,from $1500; Sony DSR-1500A, new, $5150; Sony DSR-45, new, $3995; Panasonic AJ-D950 DVCPRO 50 rcdr, from $6950; Panasonic AJ-D850 DVCPRO 50 rcdr, $3950; Panasonic AJ-D750 DVCPRO 50 rcdr from $3950; Panasonic AJ-D230H DVCPRO rcdr from $1695; Sony VO 9850 w/timecode, $1200; Sony VO 9800 w/timecode, $1000; Accom WSD Xtreme, $3500; Doremi Labs V1 DVR, $3900. 818-788-4700 or www.tvprogear.com.

EXPORT SALES MANAGER: 360 Systems has a career opportunity for an individual experienced in the sale of television broadcast equipment to EMEA or Asia-Pacific export markets. This key position is for an individual, who has experience negotiating sales with overseas distributors and broadcasters, and is comfortable in other cultures, and is able to travel extensively. Prior residency abroad and foreign language skills are a plus. The Export Sales Manager will work from 360 Systems headquarters in Westlake Village, California while in the U.S. The position includes excellent benefits, and the opportunity to participate in growth through an attractive commission structure. 360 Systems is one of the fastest-growing manufacturers of video servers. It is privately owned, with a long-term history of profitability. Sales are worldwide to multiple markets. For more information visit our web site at www.360systems.com. Contact Ralph Goldheim, VP Sales, at (818) 735-8226, or by e-mail at ralph.goldheim@360systems.com.

Canon USA is seeking a full time Technical Support Representative for its Broadcast and Communication Service Department. The Tech Support Rep will repair digital/analog broadcast lenses and equipment, provide repair estimates, maintain records and reports and provide technical support to dealers and end users.

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Business News

Avid Finalizes Pinnacle Acquisition

TEWKSBURY, MASS. & MOUNTAIN VIEW, CALIF.

Avid's acquisition of Pinnacle Systems was finalized earlier this month after winning approval from the European Commission. Both company's boards approved the transaction last month, days after Pinnacle rejected an eleventh hour bid by San Francisco-based private investor, Vector Capital.

In March, Avid agreed to purchase Pinnacle in a deal valued at $462 million. Since then, Avid's stock has fallen from $59 per share to $41, reducing the transaction to approximately $328 million.

Pinnacle shareholders will receive .0869 shares of Avid stock and $1.00 in cash for each Pinnacle share.

At closing, Avid is expected to pay $6.2 million in shares and $71 million cash.

Earlier, Pinnacle's board rejected a $200 million offer for its consumer video editing division from Vector, citing too many uncertainties.

Prior to the vote, Avid announced its second quarter fiscal results that showed a slowdown in sales.

For the three months that ended June 30, 2005, Avid reported a 14 percent increase in revenues of $160.1 million, up from $139.9 million during the same period last year.

However, quarterly income declined to $13.6 million, or 37 cents per share, from $15.5 million, or 45 cents per share a year ago.

Avid CEO David Krall attributed the quarter's results to delays in the rollout of new products in its core broadcast markets and the negative effects of foreign currency movements.

Revenues for the six months that ended June 30 were $326.1 million, compared to $267.3 million for last year during the same time.

Avid also announced a multi-million dollar deal with Fox Television Stations to convert six of its 27 stations to digital production environments for ingest, editing, storage and playout of news content.

New gear will be installed at WNYW, New York City; WTXF, Philadelphia; WFXT, Boston; WTTG, Washington, D.C.; WTVT, Tampa, Fla. and WITI, Milwaukee. The transition should be complete by the end of 2005.

The stations will match the setup of WOFL in Orlando, which made the switch to a digital workflow in May, installing an Avid Unity for News shared-storage media network and TransferManager and Media Manager software, Avid NewsCutter Adrenaline systems and NewsCutter XP systems, AirSpeed systems for ingest and playout of digital content and Avid Media Composer Adrenaline systems. ■

Belo Profit Drops in Q2

DALLAS

Belo Corp. experienced a decline in revenue during its second fiscal quarter 2005 attributed in part to the absence of significant political revenue at its TV stations.

Television group revenue decreased 3.6 percent with a 4.1 decrease in spot revenues.

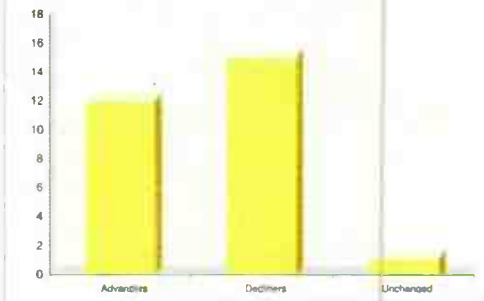
Political revenues were $1.9 million, down from $7.5 million during Q2 '04.

Revenues were $388.8 million, down from $391.1 million for the same time last year.

The company reported quarterly earnings of $41.9 million, or 36 cents per share, down from $45.6 million, or 39 cents per share during the same period last year, for the quarter that ended June 30, 2005.

In addition, the company's quarterly outcome was affected by its overstatement scandal at its Dallas Morning News newspaper. Belo has reportedly spent millions paying back advertisers who overpaid for ad space. ■

WIN-LOSE RATIO



TOP ADVANCERS BROADCAST STOCKS
(July 15 - July 29)
YOUNG + 14.66 %
EMMIS + 13.11%

TOP DECLINERS BROADCAST STOCKS
(July 15 - July 29)
ACME – 5.13%
LINTV – 4.56%

TOP ADVANCERS TV STOCKS
(July 15 - July 29)
HARRIS + 13.78%
SCI. ATLANTA + 5.48%

TOP DECLINERS TV STOCKS
(July 15 - July 29)
PINNACLE – 4.41%
AVID – 3.40%

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

TV Tech STOCKS as of July 29

Company Name	52-Week Range	July 15	July 29	% Change
Avid	39.80 - 68.35	42.6	41.15	-3.40%
Belden	17.65 - 24.59	22.18	22.2	0.09%
Ciprico	3.15 - 4.90	4.12	4.0	-2.91%
Harmonic	4.25 - 12.40	5.2	5.33	2.50%
Harris	21.60 - 37.42	32.58	37.07	13.78%
Leitch	6.72 - 11.50	10.27	10.34	0.68%
LSI Logic	4.01 - 10.75	10.11	9.76	-3.46%
Pinnacle	3.25 - 6.24	4.76	4.55	4.41%
Sci. Atlanta	24.61 - 39.23	36.5	38.5	5.48%
SeaChange	6.84 - 19.75	7.52	7.58	0.80%
Tektronix	20.97 - 34.39	24.59	25.06	1.91%

Broadcast STOCKS as of July 29

Company Name	52-Week Range	July 15	July 29	% Change
Acme	3.30 - 7.45	4.48	4.25	-5.13%
Belo	18.00 - 26.45	24.29	23.88	-1.69%
Emmis	15.29 - 20.61	18.15	20.53	13.11%
Entravision	6.87 - 9.11	8.41	8.55	1.66%
Fisher	44.09 - 52.60	44.51	45.28	1.73%
Gray	10.58 - 15.74	12.97	12.85	-0.93%
Hearst Argyle	22.57 - 26.48	24.38	25.07	2.83%
Nexstar	4.52 - 10.00	5.6	5.63	0.54%
Lin TV	13.68 - 20.70	14.9	14.22	-4.56%
Paxson	0.48 - 3.10	0.6	0.6	0.00%
Sinclair	6.12 - 10.04	8.89	9.0	1.24%
Liberty	34.32 - 46.91	37.3	38.65	3.62%
Univision	25.00 - 35.22	27.09	28.28	4.39%
Young	3.15 - 13.00	3.41	3.91	14.66%
Tribune	34.53 - 44.32	35.08	36.5	4.05%
Meredith	44.51 - 54.57	49.8	49.5	-0.60%
EW Scripps	44.73 - 52.91	47.68	50.53	5.98%

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