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WHAT'S INSIDE

FCC's 2006 Agenda

Auction logistics anticipated

Deborah D. McAdams

LAS VEGAS

There will be no rest for the regulators this year, based on FCC Chairman Kevin Martin's one-on-one with CEA chief Gary Shapiro at the Consumer Electronics Show in Las Vegas. In addition to the usual evergreens—media ownership, content protection and indecency—the FCC will have to figure out how to parse out the beachfront spectrum everyone's been hankering for.

With an analog sunset looming, Martin said details of the resultant spectrum auctions will have to be worked out. The bill in the pipeline that ends analog broadcasting Feb. 17, 2009, requires spectrum auctions to commence Jan. 28, 2008.

"We'll develop rules for public safety and commercial use," and determine whether or not to auction off blocks of spectrum geographically or city by city, he said. "It's usually a mix of geographical distribution. There are still some technical issues remaining."

The intent is to create an environment where new services immediately can be activated after analog television transmitters are powered down, Martin said. The commission will get to flex its auction chops this summer with a block of spectrum retrieved from

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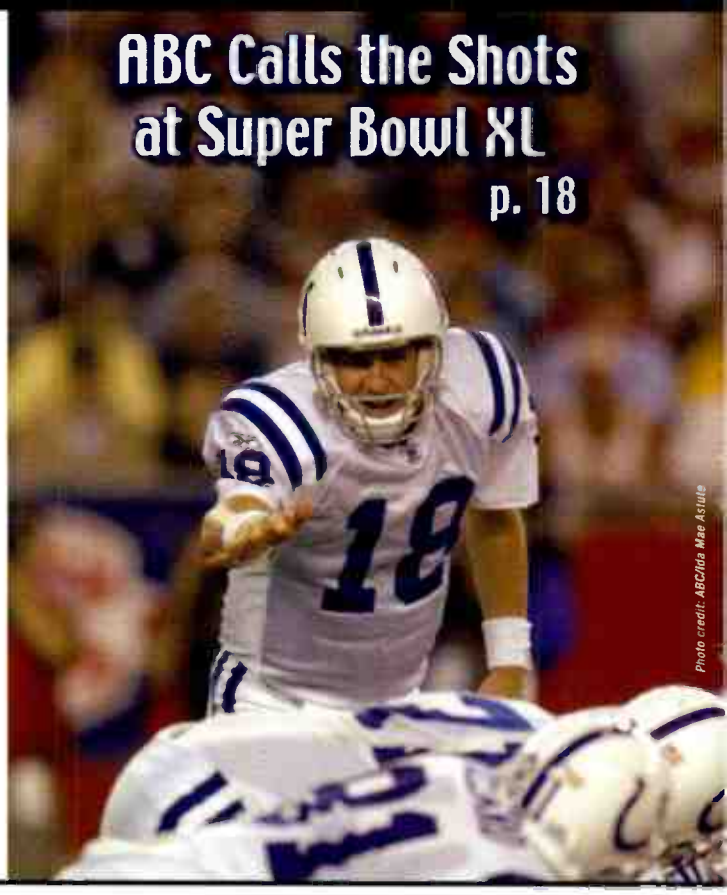

Will LPTV Be Left Out in the Cold?

DTV transition could threaten future status of stations

by James E. O'Neal

FALLS CHURCH, VA

Although low-power TV stations have been around for more than two decades and outnumber their full-power brethren, channel selection and limits on interference could spell the demise of a number of these stations when the transition is scheduled to end in 2009.

LPTVs have been around since 1982 and now number in excess of 2,700. By comparison, there are approximately 1,750 VHF and UHF licensed full-power stations.

Contrary to the beliefs of some that LPTV stations are "mom and pop" operations existing to serve niche markets, many are affiliated with the major networks and offer their viewers the same mainstream programming being carried by their full-power equivalents. LPTVs with ABC, CBS, NBC and FOX affiliations exist within some Nielsen-rated markets.

The designation "low-power" television is somewhat of a misnomer, as ERPs can run up to 150 kW in the UHF spectrum. Further, there are no restrictions on antenna height, provided that the tower structure is FCC registered and the station does not produce interference in the coverage area of a full-power broadcaster or to other licensed LPTVs or TV translators.

Also, there is no limit on the number of LPTV stations that one individual or group can own.

There are no channels set aside for LPTV use. Since the dawn of low-power, the prospective licensee has been required to locate an operating frequency on a non-interfering basis. The FCC makes the final determination and issues a license accordingly.

'SECONDARY' STATUS

The status of LPTV operations is deemed "secondary" by the FCC. This means that the station may cause no interference to a

LPTV, PAGE 10

hire definition

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EDITORS/POSTPRODUCTION

Film Effects Producer – HD/SD experience in all formats. Reliable and flexible -- long hours expected. Code EP028

Experienced Tape Operator – for duplicating, audio relays and conversions. Knowledge of broadcast specs/formats. HD experience a +. Code EP042

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Experience FCP Editor Wanted – working production company to cut boring industrial spots for clients. Long hours, poor conditions. Good rates Code EP067

VIDEO PRODUCTION

[illegible] – 100% h[illegible] 24p HD wit[illegible]. Code T[illegible]

[illegible] crew needs [illegible] hurricane [illegible] aid travel [illegible] Code TV002

[illegible]ded – Shooting [illegible] government project. Code TV003

DP for Indie Fe[illegible] 24p. Need o[illegible] Mbps HD [illegible]am[illegible] [illegible]uire [illegible]

[illegible]ie-of-the-W[illegible] Shooting at 24fps. Must have variable [illegible]me rate camera. Code TV005

HD Sports Special for Major Cable Channel – Shooting 720p at 60fps, experience with slo-mo & special effects a big plus. Code TV006

Cameraperson for Birthday Party It's my kid's 10th; need videographer for one afternoon. Cake included. Code TV007

Extreme Sports Videographer – Second camera needed for VariCam shoot. Experience in fast-action shooting a must. Code TV008

Cinematographer for Wildlife Production 60-minute HD documentary on Peru's Humboldt penguin. Shooting 720p/24 on DVCPRO HD. Code TV009

Short Film/HD shoot – HDCAM second camera. Shooting 1080p at 24. Own jib and camera needed. Code TV010

News Photogs for Cable News Channel – Experience in shooting DVCPRO50 for news magazine show, shooting DVCPRO for news. Code TV011

HD "B" Roll for Stock House - Shooting 1080p/24 or 720p/24 on DVCPRO HD, in-camera editing necessary. Code TV0102

We Buy Your Video Footage – We take your personal videos and sell as stock footage. You make money! Code TV013

SD Reality Adventure – Shoot from 60i to 24p to deliver different looks, be ready for unpredictable weather. Code TV0014

HD Music Videos – Shooting 720p/24. Must be familiar with variable frame rates to create special effects. Code TV015

News Stringer – Looking for shooters to be on scene first, fast turnaround. Own camera required. Code TV016

[illegible]ide[illegible] [illegible]otin[illegible] 48[illegible] or DV. Experie[illegible] Code TV017

HD Television Special – Cameraman/Editor wanted, S[illegible] 1080i at 30fps on DVCPRO [illegible] P2 cards. Code TV018

New Reality Show – Shooting 72[illegible] 24/30fps, experience in HD an[illegible] variable frame rates required. Code TV019

HD Commercial Production Co. – Looking for cameraman with H[illegible] experience. Shooting 24/30fp[illegible] Must be capable of IT work[illegible] Code TV020

Filmmaker to Join Faculty – Mus[illegible] latest digital tech. Instruct in [illegible]fits of multiple formats, varia[illegible] frame rates, solid-state memo[illegible] Code TV021

Shoot Video in Alaska – Juno TV Ne[illegible] Station needs cameraperson to follo[illegible] and document lditerod in HD. Harsh[illegible] conditions, but rewarding. Code TV0[illegible]

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BAS Update

photo credit: ABC/Ida Mae Astute

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Super Bowl preview

CONTRIBUTING WRITERS

André V. Mendes

Count on IT

Recently, after a couple of temporary setbacks in some very important projects, I was reflecting on the profound differences between the large scale technology deployments that I have been involved in during the course of my career and the projects... p. 24

Gary Arlen

Tuning In

A baseball game with the Trix Rabbit on the pitchers' mound, the Lucky Charms Leprechaun on base, and fielders including "Sunny," the CocoPuffs cuckoo bird, "Count Chocula" and the HoneyNut Cheerios bee might not be everyone's bowl of breakfast... p. 26

Doug Lung

RF Technology

This month, I'll take another look at receive antennas for DTV. My article "Antennas for DTV Reception" in the March 6, 2002 column on antennas for DTV reception was published almost four years ago, yet hardly a week goes by that I don't get a request... p. 34

FROM THE EDITOR

Not Quite 'Plug and Play'

By now, you're probably aware of a survey released by Scientific-Atlanta that was made public just as holiday shoppers were descending on the big box stores to scope out their new big screen displays.

According to the survey, nearly half of the 500 HDTV owners (49 percent) were not taking full advantage of their HDTV sets; more than a quarter said they didn't get any special equipment from their service provider to get HD programming because they said the picture quality was "already improved." Almost a quarter said that they thought they were getting HDTV because of the message displayed at the beginning of the program, and nearly one fifth (18 percent) believed they would get HD channels without additional equipment.

This magazine has, for years, emphasized the importance of educating the public about HDTV. And now that we're on the brink of finally making HDTV a common household presence (Sony CEO Howard Stringer confidently predicted that HDTV sets would outsell analog in 2006 for the first time), we see a consumer marketplace that isn't taking full advantage of all that the technology has to offer. How many times have you gone to a sports bar or a friend's home and watched as they stretch the picture beyond its 4:3 aspect ratio in order to fill the screen? It's not a pretty picture.

It also makes one skeptical about the future of hi-def DVDs. The popular consensus in the marketplace is that most consumers are purchasing HDTV sets to watch the improved picture that comes with progressive-scan DVDs; if they're already satisfied with the picture quality of current DVDs, do you really think that the improvements that come from hi-definition DVDs will be enough to prompt them to buy new players and replace their DVD collection?

Who's to blame? It's obvious that the salespeople, particularly in the bigger department and electronics stores, could improve their knowledge about the technology, but it will take a collective effort on all of us to get the message out that, unfortunately contrary to popular belief, HDTV is not exactly just a "plug-and-play" device.

It just goes to show: You can sell an HDTV set to a consumer but you can't force him to watch hi-def.

Tom Butts
Editor
tbutts@imaspub.com

LETTERS

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

RF Coordination at the Super Bowl

Dear Editor:

I'm writing to you in reference to an article written by Claudia Kienzle titled "Wireless Mics Search for RF Haven," (**TV Technology**, Nov. 23).

I feel it necessary to properly explain our Super Bowl operations regarding NFL frequency coordination as commented on in the article.

Although well written, the coordination efforts at Super Bowl are presented in an incorrect light. We realize that Ms. Kienzle can only report on the information she is given and she quotes James Stoffo of Professional Wireless Systems in such a manner that, although not stated, appears as though frequency coordination for the Super Bowl could or should be done through his company. If this were to happen, our function as the requency Coordinating Group for the NFL would become seriously compromised. All coordination requests for Super Bowl are presently made by e-mail to our coordination team at *SB40Frequency@nfl.com*. Mr. Stoffo is not a part of this coordination team.

I offer the following for your better understanding of some of the actual process of frequency coordination at NFL events as well as the upcoming Super Bowl.

At this Super Bowl, it is my understanding Mr. Stoffo's position is that of being hired by ATK, the audio company contracted by the NFL. Regarding coordination, Mr. Stoffo's responsibility is to coordinate the RF needs for ATK's shows, namely, the pre-game, halftime and post-game. Mr. Stoffo coordinates the 80 to 90 frequencies needed by ATK for those shows with our Frequency Coordination Group. It is our group that handles the coordination efforts for all entities using any kind of RF device at every NFL venue during the entire week preceding the game as well as the game itself.

Coordination for "all" NFL games, including Super Bowl is managed by the NFL Frequency Organization Group, a branch of the Game Operations Department of the NFL. The NFL works in concert with the Society of Broadcast Engineers, for all games except the Super Bowl, but uses a number of SBE engineers as part of the Super Bowl Coordination team. The NFL/SBE frequency coordinators are known as "Game Day Coordinators." The GDC program is funded in its entirety by the NFL Game Operations Department and for Super Bowl by the NFL Special Events Department.

The Super Bowl is such a large frequency coordination undertaking involving so many different entities that the NFL manages the coordination effort as part of its game operations, with the Frequency Organization Group reporting to the Special Events Department of the NFL.

Possibly as a matter of interest, Super Bowl coordination was first employed at Super Bowl XXX, where we had a staff of four people, including the local Phoenix SBE coordinator, Karl Voss. As we head into our 11th Super Bowl, Karl Voss is still our chief ccoordinator, assisted by other primary GDCs, namely, Dan Collins in Miami, Ralph Beaver in Tampa Bay and at this Super Bowl, the local coordinators for the Detroit Lions, Russ Harbaugh and Joe Huk. In addition to the above, the Super Bowl coordination team will have a staff of 30 this year including myself, those already mentioned, local engineers and other technical type individuals.

At the Super Bowl, our group coordinates an estimated 1,500-plus frequencies being utilized by an estimated 8,000-plus RF devices, including the needs of ATK. We coordinate all NFL venues for the entire week preceding the Super Bowl as well as the game itself. We have also had numerous meetings with law enforcement regarding other than public safety RF operations. We will also be instructing the magnetometer operators on what RF devices they should be looking for, the tagging system and how to work with our engineers positioned at every entry gate into the stadium.

I would like to point out other misleading and incorrect statements that were made by Mr. Dave Egenberger, a Telex

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HDTV: MAKING IT HAPPEN

Crown Castle Launches Modeo

HOUSTON

Crown Castle formally says it will launch live mobile TV services to 30 markets nationwide later this year.

The company de-ploys, owns and operates an extensive network of towers which it plans to use to broadcast its DVB-H (Digital Video Broadcast-Handheld) signals to cell phones and mobile devices. The launch, scheduled later this year is planned for major U.S. markets including New York City.

Crown Castle also announced that it has changed the name of its wireless division to "Modeo" and demonstrated its technology on Nokia and Motorola products at CES in Las Vegas. Last year, the company conducted beta tests of the service in Pittsburgh.

Modeo is targeting a market that is expected to exceed $1.5 billion by 2009, according to several industry analysts. The company is joining an already expanding market that includes major wireless providers such as Verizon and Sprint offering video broadcasts to mobile devices. Another competitor to the Modeo service is Qualcomm's MediaFlo service. Qualcomm has already signed up Verizon Wireless for the service, which is expected to launch this fall.

Modeo content is expected to be a mix of live video and audio channels and will also support podcasts. The video is described as "digital broadcast" at QVGA resolution at up to 30 fps.

Mobile TV

FiOS TV to Carry Sinclair Stations

NEW YORK & HUNT VALLEY, MD.

Verizon has struck a multiyear retransmission deal with the Sinclair Broadcast Group to carry the analog and digital signals of Sinclair stations WBFF and WNUV in Baltimore and WTTA in Tampa, Fla., on Verizon's FiOS telco TV service. Verizon plans to launch its FiOS-TV service in both of these markets to compete with cable and satellite program providers.

Barry Farber, vice president and general counsel for Sinclair said the agreement was made possible "because Verizon recognized the value of being able to carry our signals, which allowed for an appropriate economic agreement to be reached."

Farber said that he looked forward to working with Verizon as its FiOS-TV business grew and anticipated entering into similar carriage agreements with the company in other Sinclair markets.

Telco TV

'Prairie' Shoots with Fujinon Lenses

WAYNE, N.J.

Director Robert Altman used Fujinon high definition lenses exclusively in producing his new feature film, "A Prairie Home Companion."

A major factor in the selection of the lenses was Altman's shooting style. The production is a mixture of live performance camera work and dramatic theatrical cinematography. According to the film's HD engineer, Ryan Sheridan, the lenses allowed the capture of extreme close-ups to extreme wide shots with just two lenses. Another selection factor was the minimized flare associated with the Fujinon lenses.

"Because of the low-flare characteristics of the lenses, we had a lot of shots that were looking directly into the lights that didn't flare or wash out the image," said Sheridan.

Anticipated release date for the production is June 9, 2006. It will be distributed by Picturehouse.

Production

LCD Production Ramped Up

SEOUL, AMSTERDAM, THE NETHERLANDS

Samsung Electronics is ramping up its latest mass production line for liquid crystal display panels. Another major LCD manufacturer, LG. Philips, also announced that it has already started mass-producing its own "seventh-generation" line for large-sized monitors.

Some published reports have cited industry analysts who appear concerned that the LCD industry could face over-capacity in 2006 as Samsung, LG.Philips and others dramatically increase their assembly lines' output. At the same time, others opine that such mass production by competitors will only tend to further lower prices at the consumer level and accelerate demand for large flat-screens in 2006.

Samsung's next-gen production line ("Line 7-2") will initially produce 45,000 substrates monthly—from which eight 40-inch panels can be produced from each substrate, which averages out to 360,000 screen panels a month. It also plans to boost production in the second half of 2006 to a full capacity of 90,000 substrates (720,000 panels) per month.

LCD

New Display Interface to Replace VGA

SAN FRANCISCO

A consortium of PC and consumer electronics companies including Apple, Intel and Samsung, are developing a new specification designed to serve as the next-generation digital display interface standard for PCs.

The unified display interface (UDI) is expected to replace the VGA analog standard. The interface will be able to use High-bandwidth Digital Content Protection (HDCP) technology deployed in HDMI-compatible products. UDI will maintain backward compatibility with DVI displays.

"We welcome this new secure digital interface with even higher image quality," said Chris Cookson, president, Warner Bros. Technical Operations and CTO, Warner Bros. Studios. "Technologies like HDCP allow exciting new consumer opportunities by assuring that a diverse range of choices can be offered."

Other members of the UDI Special Interest Group include LG Electronics, National Semicon-ductor and Silicon Image.

Connections

USDTV to Launch in Virginia Market

SALT LAKE CITY

USDTV, the Salt Lake City company that offers an all-digital pay TV package over spare broadcast bits, will launch its service in Norfolk, Va., this spring.

The Norfolk market will be USDTV's fifth one and the first on the east coast. Other USDTV markets include Dallas/Fort Worth, Salt Lake City, Albuquerque, and Las Vegas.

The service will ride on digital bits provided by a local station owned by LIN TV. The package will include more than 30 channels, including local stations and cable networks such as ESPN, Discovery, Disney and the Fox News Channel for $19.95 a month. Starz is also available for another $6.95 a month. The basic price will be locked in for two years, according to the company.

"We have closely observed the development of USDTV over the past 18 months and believe many of our citizens will benefit from a low-cost all-digital over-the-air TV service," said Hap Cluff, director of information technology for the City of Norfolk.

The service is received through a standard VHF/UHF antenna connected to a USDTV set-top box, "which produces a digital-quality picture on an analog TV or an HDTV quality picture on an HD-ready TV for those programs broadcast in that format," according to USDTV. The box retails for $24.95.

Last November USDTV announced a $25.75 million funding agreement with several partners, among them: Fox Television Stations, Hearst-Argyle Television, McGraw-Hill Broadcasting, LIN TV Corp., Morgan Murphy Stations and Telcom DTV, LLC.

DTV

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C300 – Perfect for Post Production

- Scalable flexible DSP designed for surround mixing
- Dynamic Resource Allocation™ optimises processing
- TimeFreeze™ automation increases mix efficiency
- Serial and DAW control integrates machines elegantly
- Surround monitoring allows multiple format auditioning

C100 – Ideal for On-Air Production

- Reliable, fault-tolerant broadcast design
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- Compact console fits the smallest control room
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FCC

CONTINUED FROM PAGE 1

government entities.

Regarding content protection, Martin said the commission had a "much more limited role in digital rights management and copyright protection.

"We tried the broadcast flag, and the court said we didn't have the jurisdiction, which is why Congress is back to considering what our role should be."

"We tried the broadcast flag, and the court said we didn't have the jurisdiction, which is why Congress is back to considering what our role should be."

—Kevin Martin, FCC Chairman

If the flag does get bounced back to the FCC, Martin said it raised questions about the inclusion of digital radio.

"If Congress gives the FCC the authority to do the broadcast flag, it should be broadcast in general," he said.

Martin, who was elevated to chairman last April, had yet to have a full commission by **TV Technology** press time. One seat, vacated last month by Kathleen Abernathy, remained unfilled. As such, the commission hadn't waded into media ownership rules nor levied any indecency fines after a record $7.9 million were imposed in 2004.

SEVEN DIRTY WORDS

Martin said the FCC was still legally bound to regulate broadcast content, but that it also needed to "provide clarity" for what's inappropriate. The Michael Powell-led commission, in which Martin served, baffled broadcasters by first allowing an Irish rock star to say the F-word on network TV, then later fining the network. Martin said such utterances must be judged subjectively.

"We don't have the 'seven dirty words,' because context matters," he said, referring to the old George Carlin riff on what can't be said on TV. "NPR did an interview with John Gotti that was run uncut. NPR determined it had news value, and the FCC specifically said, 'that's fine.'"

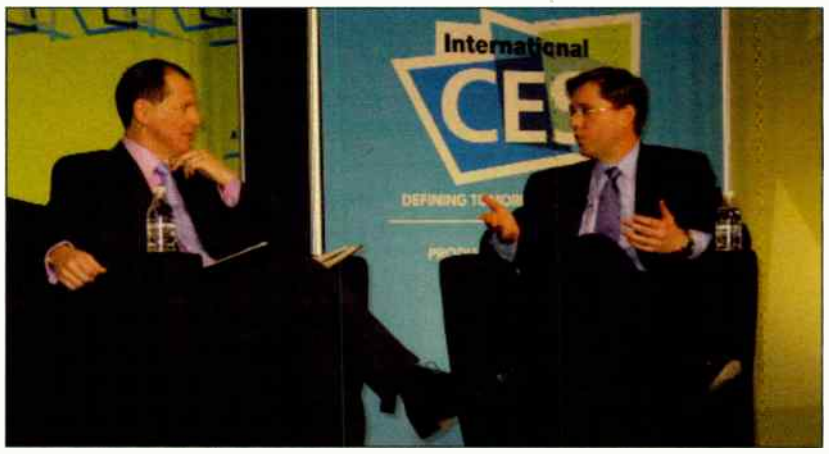
Rather than being the F-word cop, Martin would prefer see consumers have more control over content choices. He said as people migrated away from broadcast and cable to IP and broadband video, this would happen naturally. In the meantime, a variety of options could be made available, including à la carte and a blocking/reimbursement scheme.

Martin sent the cable industry into nail-spitting mode in December when he said the FCC's initial conclusions from its à la carte study—which reflected the cable industry position—were flawed. He said the new analysis would be released, but he didn't say when.

While perhaps not the deregulatory crusader his predecessor was (at least until the indecency hullabaloo), Martin is nonetheless pro-competition. He saw no problem with allowing satellite radio to carry local news, something local radio broadcasters are fighting. The more broadband providers in the market, the merrier, he said; and Internet phone service should only be regulated to the extent that subscribers can call 911. Martin also rejected the idea that broadcasters generating a second revenue stream, as with USDTV, should be charged for spectrum. USDTV, the service that transmits a multichannel pay service on spare broadcast bits, announced its first East Coast launch, in a Virginia market, during the course of the trade show.

"Free over-the-air broadcast provides a very important service," Martin said. Broadcasters "need to monetize content in other ways... to maintain free over-the-air broadcast."

He also said that hi-def signals should be protected from degradation, given the money invested by stations in HD equipment, and "consumers having bought their 100-inch HDTVs."



CEA chief Gary Shapiro grills FCC Chairman Kevin Martin at the Consumer Electronics Show in Las Vegas.

Allowing unlicensed devices into broadcast white space is another issue that remains on deck at the FCC, and Martin let it be known he's a pro-unlicensed devices kind of guy.

"The most recent increases in innovation have occurred in the unlicensed space," he said. "It's important for small companies to be able to go out and use the spectrum." Docket 04-186, the FCC's Notice of Proposed Rulemaking on unlicensed devices, remains open, Martin noted.■

BUYERS & SELLERS

CPAC, the C-SPAN of Canada, has moved to a tapeless workflow environment with **Sundance Digital**'s Titan automation package as the core of its digital upgrade.

The cable public affairs channel, located in downtown Ottawa, provides around-the-clock political and public affairs programming to more than 9.5 million Canadian viewers over cable, satellite, broadcast and the Internet. CPAC's 2-channel Titan configuration drives one on-air channel as well as the network's Web stream. The automation suite is comprised of Titan Air and Media Prep stations to manage content on an Omneon video server, Intelli-Sat Broadcast Manager to schedule and record feeds, and TitanSync for redundancy.

The system controls a Sony HDSX 3700 router, Sony IMX VTRs, a Quartz QMC-SD master control switcher, a Chyron CG and an Evertz caption encoder and log generator. Titan is also closed interfaced with CPAC's BroadView traffic system.

CBS affiliate WTSP-TV has signed a three-year partnership agreement with **AWS Convergence** to deploy the AWS WeatherBug Zoom On-Air Display System and the WeatherBug online, desktop, community outreach and mobile program components to deliver exclusive live, weather conditions at the neighborhood level.

Local information will stream to the station from 24 WeatherBug tracking stations and 11 WeatherBug cameras, including a new installation at the Tampa Bay 10 broadcast studio in St. Petersburg, Fla. Tampa Bay 10 will also provide content for the WeatherBug desktop application, which is used by 67,000 at work and in-home viewers in the Tampa St. Petersburg/Sarasota market.

Sinclair Broadcast Group has purchased a **Modulation Sciences** MSI 8-VSB analyzer for all group stations. The equipment will be used to ensure that digital transmissions meet the highest industry technical standards.

The analyzer provides eye and constellation pattern displays, complete tap weight analysis, remote Web access, data-logging, user-configurable alarms and other features.

Griffin Communication's KWTV in Oklahoma City recently installed the **Telestream** MAPreview digital video capture and logging product as part of a station initiative to replace tape-based archives with a file-based digital archive system.

Before the conversion to MAPreview, the station had been recording all of its aired programs onto VHS tapes and all of its newscasts onto Beta media. Now KWTV is capturing and archiving all station content in Windows Media 9 format onto MAP media capture servers.

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- Robust software applications
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LPTV

CONTINUED FROM PAGE 1

licensed full-power spectrum user and has to endure any interference caused by such "primary" operations. This can be the undoing of an LPTV operation, as the full-power broadcaster can bump the LPTV if interference or reduction of coverage is proven.

As a result of this secondary status, there may be no room at the inn once former analog full-powers settle into their permanent digital channel berths and the FCC auctions off the remaining spectrum. One early FCC estimate indicated that 35 to 45 percent of the present low-power television stations would either have to find new frequencies or go dark to protect full-power stations in the DTV transition.

For this reason, there are no guarantees that all LPTVs can continue to operate after the 2009 hard shut-off.

Some LPTVs are not secondary. In 1999, Congress enacted the Community Broadcasters Protection Act, creating a new subset of LPTV players. Qualifying stations are termed "Class A" and are afforded a special level of protection for their signal contours. Existing LPTVs could qualify if certain programming and performance requirements were met. Class A stations still have to respect existing full-power analog grade B service contours, as well as those of all full-power DTV allocations and service areas of existing translators and non Class A LPTV broadcasters.

Class A status is not always a safety net, as at least one LPTV broadcaster discovered.

Robert Suffel started a low-power operation in Sacramento, Calif. in 1994. When the opportunity to go Class A opened up, he applied for, and was granted this level of protected operation. However, there were no guarantees. Suffel's assigned channel was needed for full-power digital expansion and an alternate LPTV frequency could not be readily identified. He spent nearly two years and thousands of dollars in engineering and legal fees before giving up and watching his KBTV-CA go dark.

"The FCC could not approve a replacement channel and we went dark in the spring of 2000," he said. "At the time the FCC released their proposed DTV channel allocations, I noticed that if they had simply switched my assignment with one in San Jose they could have saved two LPTVs. However, the FCC said they didn't have the resources to make exceptions."

(After Suffel's station signed off, another Sacramento LPTV started up with the KBTV-CA call. Suffel said that this didn't happen until after the new operators put a lot of money into engineering work in order to make it possible.)

Making changes to accommodate the changing full-power landscape can get expensive too. Greg Herman, president of WatchTV Inc., a Portland, Ore.-based owner of 19 stations in Washington and Oregon, said that over the last several years, his group has spent millions to accommodate the digital channel assignments made to full-power broadcasters.

"About 70 percent have had to be re-channeled," he said. "We spent a great deal of time, effort and money in putting all our channels into the core. It's not for the faint of heart.

"And it's not just the hardware costs, but also the challenge of maintaining an identity and moving our viewers. People don't often reprogram their TV receivers after they first buy them. There are costs in trying to inform viewers about changes. The word 'hardship' is putting it mildly."

NO ANALOG SHUTOFF

Sometimes overlooked in the current round of hard cutoff dates and set-top box legislation, is that for now, LPTV stations are exempt from the 2009 mandate. Even though NTSC broadcasting may end at full-power stations, individuals without set-top decoder boxes won't have a permanently dark TV receiver if they are within range of a LPTV transmitter.

Currently, LPTVs cannot request a digital expansion channel. This could change, as the FCC is expected later this year to begin accepting applications from LPTVs that want to add digital. However, the onus will be upon the LPTV licensees to locate suitable channels for DTV.

Jason Roberts, president of the Community Broadcasters Association (CBA), said the commission has been "pretty generous" in authorizing LPTV operations. However, the situation could change with the channel shuffling and annexation going on.

"I think that some of these stations will be allowed to operate until interference problems surface, but there is a chance that some LPTVs will be squeezed out," he said.

Dr. Byron St. Clair, a Colorado-based LPTV engineering consultant and one of the driving forces in the creation of LPTV service, was encouraged about the eventual digital shakeout in the low-power industry, explaining that on the whole, digital transmission would benefit LPTV broadcasters.

Low-power television station WPHJ-CA, located in Vidalia, Ga.

"A digital signal is watt-for-watt worth more than analog," he said. "A DTV signal is about 12 dB more effective than current analog transmissions."

St. Clair added that present LPTV power levels will drop by a factor of 10 once digital broadcasting is initiated.

"Three hundred watts for VHF and 15 kW for UHF, these are the digital LPTV power levels," he said.

However, St. Clair is not overly optimistic about low-power operations rushing to make the digital switch.

"LPTV stations will have to put out a substantial amount of money before they can start operating digitally," he said. "Most LPTV players are going to be hard put to see any business sense in DTV broadcasting until there are more sets out there."

St. Clair said that at present, no more than "a handful" of LPTV stations are broadcasting digitally and those that are performed flash cuts on their own volition. Most would rather not flash cut, as they are fearful of losing audiences.

WatchTV has already laid the groundwork for DTV as part of its rechanneling efforts. All of the group's transmitters are now digital-capable. Herman expects that upwards of $30,000 will have to be spent at each station for the remaining equipment.

"We're trying to set aside funds for this," he said. "Because of the relocations, we're a bit ahead of the game. For stations who are not prepared, we estimate that it will cost somewhere between $85,000 to $175,000 to make the move to digital."

BRIGHT FUTURE

What is in store for LPTVs as the nation gets closer to digital-only broadcasting? Herman thinks that despite the costs and inconvenience, the future is indeed bright.

"Digital will be much better for LPTV than analog—if we can survive the trip," he said. "All we want is a level playing field. People will start to realize just how good over-the-air TV really is."

Roberts also remains upbeat about the future for LPTVs.

"I think right now it's an exciting opportunity for our industry. It gives the ability to add a second channel to ease the transition. The primary concern for us is, that as secondary status broadcasters, we have very limited cable must-carry rights. Without cable, the stability of the industry could be hurt."

When asked about converting LPTVs to digital, Roberts expressed the opinion that it would probably be no different than with full-power broadcasters.

"Some will go kicking and screaming, while others will go quietly."

In Sarasota, Fla., Burt Sherwood has brokered LPTV transactions for more than 20 years through his business, Burt Sherwood & Associates and The LPTV Store, and believes that the future is bright.

"It's going to be a wonderful future for anyone going into the next round of television with six MHz of spectrum as his own," he said.

"There's a lot of money out there for LPTV players. We're looking at multicasting, data transmission. There's so much you can do. This is the last of the free spectrum. Once the new DirecTV boxes (with terrestrial reception capability) are out, LPTV will give cable one hell of a hard time."

In spite of his optimism, Sherwood admits that some players could come up short when the digital transition does occur. Also, he acknowledges that a LPTV flash cut may not be the best thing to do right now.

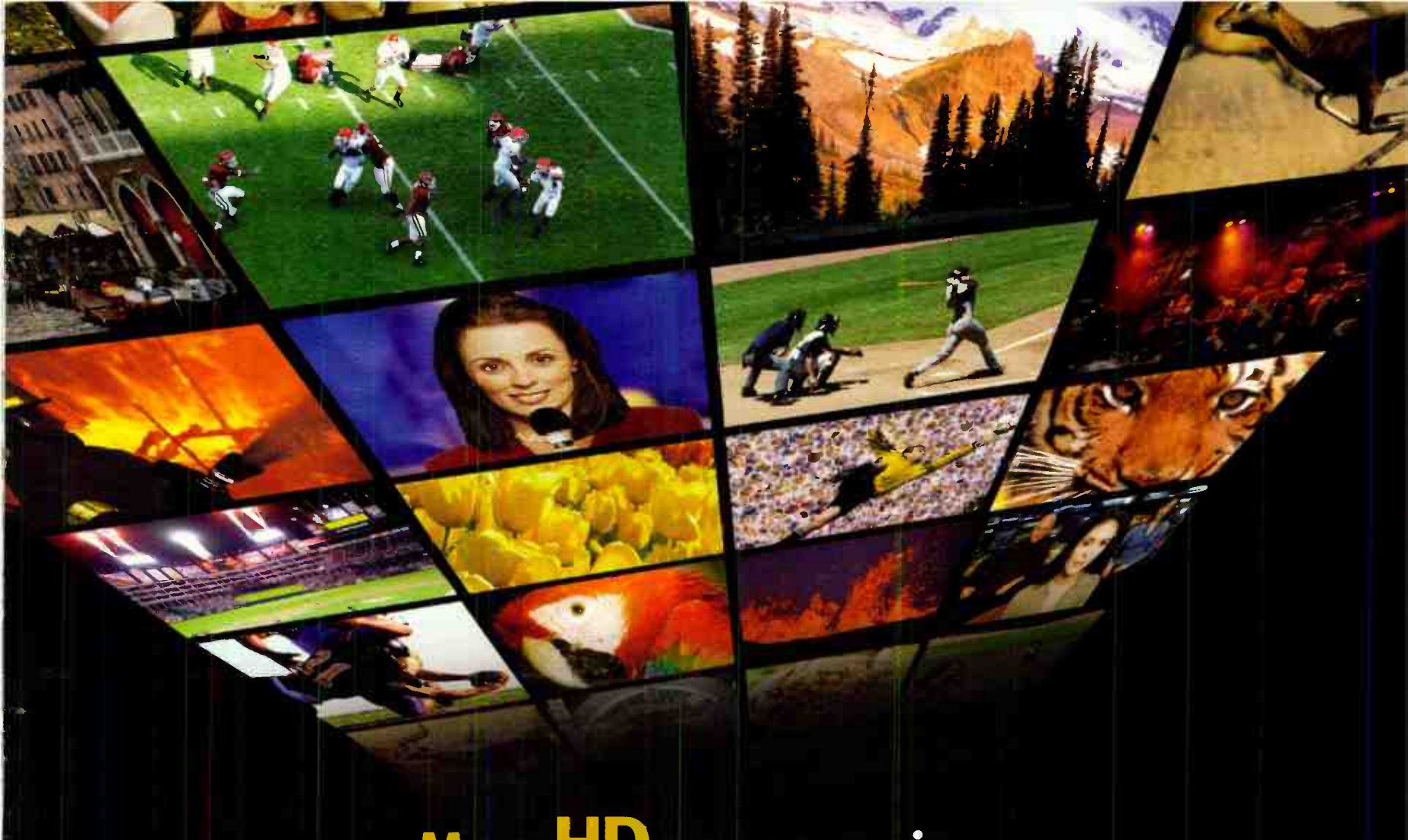
"I have a totally digital station for sale—no nibbles in the last seven or eight months. Sometimes a station sells in a matter of days or weeks, maybe a little longer. Right now the average guy isn't going to spend this kind of money for digital station," Sherwood said. "He's thinking that the majority of his audience has analog TV sets." ■

The Evolution of LPTV

The concept of low-power or "community television" is much older than the 1982 authorization date. In television's post-WWII history there was originally a channel "one" (44-50 MHz.), carved in 1945 from the old FM broadcast band. Channel one was designated exclusively for community TV service. A number of smaller cities were given channel one assignments and at least a few construction permits appear to have been issued. However, the channel and the concept were both deleted sometime later, and by 1948 had disappeared without a trace.

According to Dr. St. Clair, present-day LPTV arose from an earlier licensed service—TV translators. These low-powered transponders were authorized early in the television's post-WWII growth period to allow stations to reach audiences that were unserved due to blockage by terrain features. Current LPTV rulemaking and operations stem from a proposal to "upgrade" the status of some existing translators to provide programming independent of what was normally retransmitted.

James O'Neal



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2 GHz Relocation: The Road Ahead

Sprint Nextel has ambitious plans for the BAS transition in 2006

by Michael Degitz
Vice-President, Sprint Nextel, Global Development and Spectrum Management

RESTON, VA

At Sprint Nextel, we are making a New Year's resolution that hopefully many of you will share.


Michael Degitz

No, it has nothing to do with losing those few extra pounds picked up over the holidays. Our resolution is to continue our progress on 2 GHz relocation by completing our first TV market relocations and kicking-off the remaining TV markets.

PROGRESS MADE

But unlike many attempts to lose weight, the good news is that we're all poised to make good on this goal. Over the past year, there has been significant progress made on the FCC's mandate to upgrade 2 GHz transmission facilities, involving most broadcasters and fixed link service users operating in the 1990-2110 MHz spectrum band. Relocation has been successfully initiated in 99 markets, with 75 in the inventory stage and 24 in contract negotiations. Overall, more than half of the affected broadcasters are already officially engaged in relocation. These statistics are a clear indication of the progress and cooperation between broadcasters and Sprint Nextel last year.

The key to a successful relocation is completing a Frequency Relocation Agreement (FRA). An FRA is designed to document the equipment and services required for a station's relocation and how the broadcaster's costs will be reimbursed.

As I outlined in the last column (Nov. 9, 2005), relocation begins with broadcasters conducting self-inventories of existing equipment, entering the data into the 2 GHz Relocation Inventory Tool (*https://inventory.2ghzrelocation.com*). The results thus far are encouraging: More than 520 broadcasters have submitted inventories to Sprint Nextel and more than half of those inventories have been verified, reviewed and "locked"—meaning that Sprint Nextel and the station have agreed on which items are eligible for compensation.

An exact inventory prepares broadcasters for the next step of developing and signing the FRA. With many stations entering this important phase, I'd like to provide an overview of what broadcasters can expect.

ESTIMATING COSTS

Once the inventory is set, it's time for broadcasters and Sprint Nextel to figure out the cost of relocation. This initially involves broadcasters soliciting quotes from manufacturers for big-ticket equipment, service providers for labor services and other vendors for ancillary equipment. Sprint Nextel expects quote packages to be returned to Sprint Nextel within 35 calendar days from the time the broadcaster agrees to their verified inventory. This is an involved process, which includes soliciting quotes from third parties, creating soft cost estimates and seeking corporate approval of the quote package for group-owned stations. The good news for broadcasters is that they have a great resource in their Sprint Nextel Regional Team that is available to provide assistance on assembling quote packages. You can visit *www.2GHzRelocation.com* to find contacts in your area. In addition, Sprint Nextel provides a Broadcaster Information Guide and an Excel-based quote tool to assist in compiling the required information.

The quote package provides all the pricing and documentation information to create the FRA terms (see Fig. 1). It's important to note that soliciting quotes from the manufacturers should now be a fairly streamlined task; they are now well-versed in the process, making "clean" quotes that are easily approved.

In addition to quotes for tangible items, stations separately estimate the remaining soft costs, which include engineering, project management, legal labor conducted internally or contracted from a third party; as well as consumable items such as gaffer tape or small hardware. Soft costs plus manufacturer quotes are bundled into the quote package and submitted to the Sprint Nextel Spectrum Resource Manager in each region.

PACKAGE AGREEMENT

Sprint Nextel then reviews the equipment allocations for consistency with the station inventory and verifies quotes from the manufacturers and service providers. If broadcasters choose to use this opportunity to upgrade their equipment or "upsell," (at their own expense), Sprint Nextel will also handle those distinctions and calculations.

The final step is when the broadcaster and Sprint Nextel agree on the quote package, refine the terms of the FRA and sign it. Once the FRA is signed, broadcasters can begin buying and installing equipment and sending monthly invoices for reimbursement.

While the 2 GHz Relocation is off to a good start, we still have a lot of work in front of us. Like any New Year's resolution, the hardest part is not the beginning, but making it last through to next year. Together, we can stick to the program, sign FRAs across the country and make good on this important initiative. ■

SignaSys Preps Stations for 2 GHz

Systems integrator trains operators to bridge the analog/digital 'knowledge gap'

by Craig Johnston

SAN JOSE, CALIF.

There has been much attention given to the hardware replacement side of the Broadcast Auxiliary Service 2 GHz spectrum relocation program, for which Sprint/Nextel is picking up the billion-plus dollar tab.

But there's also a training component, for which system integrator SignaSys, Inc., is taking the lead role.

After Sprint/Nextel consulted with representatives from SBE, NAB, MSTV and other industry groups, they realized the move from analog to digital microwave equipment, which was necessary to free up a portion of the 2 GHz band, was raising fear of the unknown with ENG microwave operators and other technical people at the stations.

"[The broadcasters were saying] 'if the day after we put that equipment in service we can't go out and keep doing business the way we've been doing it, then we've got a problem,'" said David P. Otey, CPBE, engineering manager for SignaHelp, the SignaSys support and training arm.

TECHNICAL UNDERSTANDING

The result is a two-pronged education and training initiative that will have SignaSys holding all-day "market" sessions for chief engineers and what Otey terms "technophiles," who are going to want not just some examples of how the equipment works, but also a technical understanding.

Following those meetings, SignaSys will schedule at least two 3-hour hands-on "station" sessions for microwave operators at each station affected by the 2 GHz relocation.

The chief engineer and technophile sessions will come first. "Part of the reason for that is that we'll spend some time with the engineers to walk them through the training that we're going to come in and give their operators," said Otey.

One reason SignaSys will be showing them the operator training is to give the chief engineers confidence their people will be prepared when the relocation "switch" is thrown in their market. The other reason he identified is "so they can go back to their stations and generate some enthusiasm about this.

"What we're trying to accomplish by our training is to see to it that all of the people who haven't already adopted this technology can benefit from the body of knowledge that has been built up by the people who adopted it early-on," said Otey.

He pointed out that the years of analog microwave experience the operators have will mean they aren't

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Product Ready

We're stocked with an expansive "ready to ship" inventory of radios specifically for the BAS Relocation. Want to see for yourself? Go to www.mrcbroadcast.com for the latest pictures.

Manufacturing Ready

Our goal for the 2GHz Relocation is to provide customized solutions for our customers on time – every time. We significantly increased manufacturing floor space, plus increased manufacturing output beginning in early 2005. MRC is ISO 9001 Certified.

Customer Service Ready

MRC is the only company with a full time team dedicated to the BAS Relocation effort. The Industry's largest service staff is now even larger, increasing by 80% in 2005. Plus, we provide a dedicated service inventory.

Field Support Ready

Need a quick, in-house response for service? In 2005 our technical support staff increased by over 100% and repair staff increased by 70%, enabling our experienced staff to offer reliable and comprehensive service after the sale. Emergency service is available 24 hours/day, 365 days/year.

MRC's proven track record for superior products and service after the sale reinforces its longstanding market leadership in broadcast microwave technology. MRC's innovative digital microwave products give you optimum flexibility and quality in both fixed and mobile applications for SD or HD broadcasting. Contact MRC today to become the leader in your market.

MICROWAVE RADIO COMMUNICATIONS

2 GHz BAS Relocation

SygnaSys

CONTINUED FROM PAGE 12

starting from zero. "What these operators already know has a lot of value, they already know how to do their jobs.

"Setting up a microwave shot in a dynamic, real-time environment for newsgathering is something that is unique to broadcasters. Of all the different industries that use microwave technology, this is the only one where you're just going out, throwing up a shot, aiming the antennas and saying 'does it work?'"

ON THE ROAD

To help stations bridge the knowledge-gulf between analog and digital microwave operation, SignaSys will dispatch at least six instructors, each a former chief engineer with 20-plus years' experience in television broadcasting. Each instructor will travel a region of the country in a van carrying sets of new digital ENG equipment from several leading manufacturers. The training equipment, rather than being installed in the vans, will be in road cases that can be rolled into the stations.

"We'll have a transmit rack, which represents what you would have out in the field, and a receive rack, that represents what you would have back at the station," said Otey.

The transmit rack will contain microwave transmitters, a self-contained video server to supply program material to be transmitted, small, feed-horn antennas, and monitoring equipment.

(L to R) SignaHelp senior engineers Ben Kretchmar, Bill Hamilton and Drew Kraus configure the Hands-On Training System (HOTS), a central feature of the BAS training program.

The receive rack, which represents microwave equipment back at the station, will contain several receivers, remote-control systems, and monitoring equipment. Rounding out the complement will be a remotely controllable two-foot diameter steerable receive antenna.

Otey predicted that in 90-percent of the cases, the equipment in the rack will allow the operators-in-training to use the same equipment the station is purchasing through the Sprint/Nextel 2 GHz relocation plan.

The transmit and receive equipment will be capable of operating in both analog and digital modes.

"Operators will actually put their hands on this new equipment, operate if first in the analog mode to verify that 'yes, we already know how to do this, and let's talk about what the steps are, let's name them, let's establish what we already know,'" said Otey.

"Then we'll switch over to the digital mode and let the operators experience what's actually different about this. It looks different on the monitors when you're bringing in a shot, but how much is actually different from what you're used to doing?

"What we want to accomplish from this is to show the operators that their workflow really doesn't change that much. It's just that the way they look at what their system is doing is going to be somewhat different."

The major difference for operators of digital microwave coming from the analog world is that on an analog microwave shot, much of the liveshot's quality information is available in the picture itself, and when the signal begins to degrade, it is seen in a gradual degradation of that picture.

The picture that results from a digital signal is either there, in good quality, or not there, causing the so-called "cliff effect." Because of this, the operator must rely on test equipment to evaluate the quality of the digital signal to determine if it is approaching the point where the live-shot will fail.

[For a more complete discussion of

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SignaSys

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the differences between analog and digital microwave, see "Digital ENG By the Numbers," p. 16.]

SPECTRUM MONITOR

In the hands-on training, microwave operators will get a chance to construct scenarios where the signal level is too low, or too high, or contains multipath interference, or has another signal operating in the channel.

A key to being able to evaluate the digital microwave signal is by using a spectrum monitor, which has found its way into stations for satellite ENG work but is not generally in use for analog microwave live-shots.

"We'll show them how to use the information available to them, from the spectrum monitor and the metrics from the receiver that they can see on the remote control screen, and from their own knowledge," said Otey. "They'll troubleshoot those scenarios, making changes that will get them back to a good solid operation.

"We want to remove that fear factor and get people actually excited about how much more robust the digital systems are, and how much easier their jobs will be when they're deployed."

At press time, none of the SignaSys training sessions had been scheduled. This is due to delays in getting all stations in a market to sign their Sprint/Nextel 2 GHz BAS relocation agreements, which is a necessary step before the training in a market can begin.

The benefits of the SignaSys training will spread beyond merely the stations and other entities that are part of the 2 GHz BAS microwave relocation.

"We're going to make all of our training materials freely available on our Web site, including video clips of different modules of our training seminars, and all of the printed materials," said Otey. "They're going to be freely available to the industry." ■

SBE Raises Concern Over Potential BAS License Terminations

The Society of Broadcast Engineers is helping broadcasters save the potential termination of their BAS licenses starting next month.

In January 2004, the FCC made a declaratory ruling (Docket 05-23) which provided details about the commission's update of the Universal Licensing System (ULS). The SBE believed that the ruling was unclear regarding broadcast auxiliary licenses (BAS) and that this could cause termination of some BAS licenses.

The FCC ULS contains an automated feature that flags the licenses, locations or frequencies not filing a timely notice of completion of construction or request for extension of construction or coverage period. The ULS will then notify licensees that licenses, locations or frequencies have been automatically terminated. The termination list will then be posted in a public notice on a weekly basis.

To help broadcasters safeguard BAS licenses, the SBE is providing instructions for broadcasters to preclude the automatic terminations that are set to begin Feb. 1. These instructions are contained in a special document created by the SBE, "Avoiding Automatic Termination of Broadcast Auxiliary Licenses on 2/1/06." This document was initially published in an SBE e-newsletter and will also be published in the February issue of the SBE member newsletter, "The SBE Signal."

James O'Neal

Digital ENG By the Numbers

When monitoring D-ENG, what you see may not be what you get

by Craig Johnston

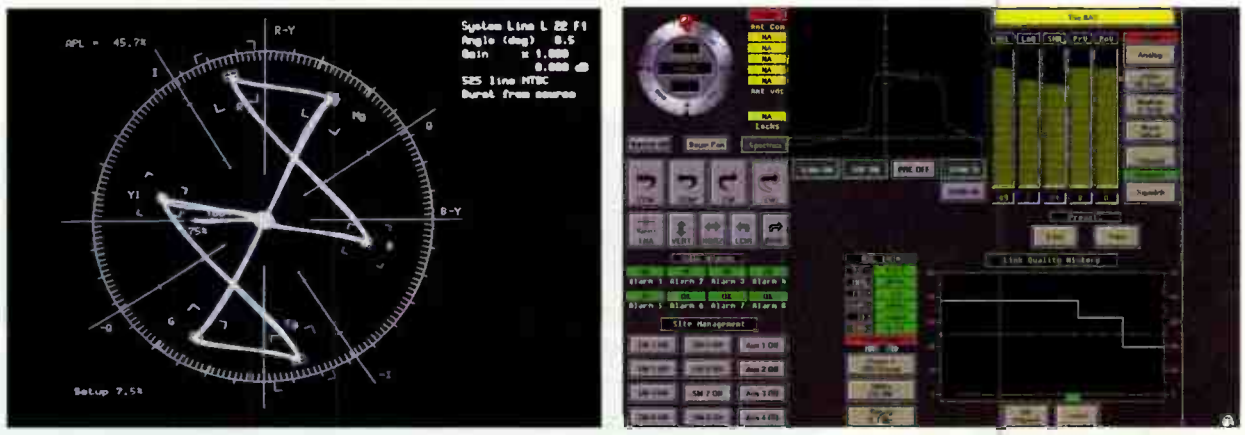
SEATTLE

In the world of analog ENG microwave, the video picture itself is a valuable tool to test the robustness of the microwave signal. ENG techs training to use digital microwave will find there are new tools required for the job.

For the engineer or videographer setting up the liveshot from the field, things will be pretty much the same. The differences between analog and digital ENG microwave operation will be apparent only on the receive end of the live-shot, back at the station.

What the receive-operator will find is that with digital microwave, the picture itself, which contained much of the indication on the quality of an analog microwave signal, will be of little use other than to tell him the live-shot has failed.

In the analog world, as the receive operator brings in a live-shot, typically sitting in master control or in a live-shot control room, he is looking at a video monitor and listening to speakers, watching as a clean signal emerges from noise.



On the left is the output of a typical vectorscope, analyzing analog picture quality. On the right, digital signal quality (top, middle), as represented by MRC's spectrum viewer option, and digital link quality over time, also known as the "confidence factor" (lower right).

Then the operator examines on a vectorscope the colorbars transmitted over the microwave link, looking to minimize noise in the dot pattern. On a waveform monitor they look to minimize noise on the sync-tips.

"Essentially what they're doing is processing a lot of visual information other than the content of the picture, and making a subjective assessment of the quality that really is pretty accurate," said David Otey, engineering manager for SignaHelp, the Signasys support and training arm.

"That way of optimizing an analog microwave signal is pretty useful and pretty robust," said Otey. "If you've minimized the noise on the colorbar dots, you've done a pretty good job of making sure you've got a solid microwave signal."

BOOM, THERE IT IS

Multipath interference, where a

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D-ENG

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delayed reflection of the main signal mixes with that signal, is also apparent in the video output of an analog microwave shot, seen as "ghosting."

In the world of digital microwave, none of those indicators work in evaluating the quality and optimizing the live-shot.

"With the digital system, once the receiver is able to lock up on the signal, it's going to give you a good, clean, noise-free picture," said Otey.

"[As they bring in the live-shot,] they won't get this gradual change from bad to good. Instead, when you have enough signal that's free enough of noise and distortion in the digital domain, boom, suddenly you're going to have a picture."

This is the so-called "cliff effect," a characteristic of the digital RF transmission where as the signal reaches the fringes of acceptable reception power, there is no discernible degradation of picture quality until the level of reduced power reaches a threshold. At that point, picture quality changes from perfect to no picture.

The fact that the operator is looking at a good, clean picture tells him only one thing: that the quality of the microwave signal is still sufficient to supply video and audio. The picture itself gives no indication how close the microwave link is to failing, which may cause the picture to freeze, mosaic or disappear altogether. Instead of the video monitor, vectorscope and waveform monitor, the digital microwave receive operator will have two new tools at his disposal, the metrics from the digital microwave receiver and information available from a spectrum monitor.

(Sprint/Nextel will supply spectrum monitors along with the new digital microwave equipment as part of the 2GHz BAS relocation program.)

"The combination of the spectrum monitor and the metrics available from the receivers—and that will depend on some extent to the brand of receiver you're using—will give you a good answer to the question [of the quality of the microwave path]," said Otey.

'BART HEAD'

A good quality digital microwave signal on a spectrum monitor appears as a pedestal with a flat, but slightly wavy top.

"Some engineers refer to it as a 'Bart head,' as in Bart Simpson," said Otey.

Multipath interference will exhibit itself on the spectrum monitor as a tilting of that flat top of the pedestal, or a curving of the top or a notch in it. Operators need to learn by looking at such a condition on the spectrum monitor how close they are to "breaking" the live-shot, going from that high quality video picture to a totally degraded or lost image.

As Otey indicated, information available from the digital microwave receiver varies with the brand. In the case of MRC's product, there's a readout called "link quality," which is indicated as a number.

"So you look at that number and ask, has that number dropped?" said Otey. "If it drops further, then you know you're likely to lose the shot." He said operators must learn to evaluate information from both the microwave receiver readout and the spectrum monitor to judge the strength of a signal path.

The clear advantage to digital microwave is that the receive-operator will, by evaluating the spectrum monitor and microwave receiver metrics, be able to spot and troubleshoot a weakening of the microwave signal without experiencing a degradation of the transmitted video itself. ■

ABC Sports Prepares for HD Super Bowl XL

Detroit winter weather may present the biggest challenge

by Ken Freed

DETROIT

When ABC Sports cameras zoom in on the football for the opening kickoff of Super Bowl XL in Detroit's Ford Field at 6 p.m. on Feb. 5, more than 130 million viewers in the United States and perhaps 1 billion viewers worldwide will see the most technologically advanced Super Bowl ever.

"Sports is always at the cutting edge of hi-tech on television," said George Hoover, senior vice president of engineering at NEP Supershooters, the mobile division of NEP Broadcasting in Pittsburgh that will bring three trucks to Super Bowl XL. "Since the first super slo-mo cameras five years ago, the NFL is generally a driving force for new TV technology." NEP is bringing Supershooter 26, the HDTV rig used to shoot Monday Night Football on ABC for the past three seasons, to the event. NEP also is bringing in Supershooter 20, the HDTV truck used to shoot Sunday Night Football for ESPN.

The three-and-a-half hour pre-game show and the shorter post-game show will be shot in HD using Supershooter 18.

Separately, the Denali Silver truck will be used for the "Bigger Bang" half-time show featuring the Rolling Stones, sponsored by Sprint Nextel and produced by Don Mischer Productions, which did last year's Super Bowl half-time show with Paul McCartney in Jacksonville, Fla.

As with previous Super Bowls, there will be lots of eye-catching commercials during the breaks.

"Last year, there were 26 commercials in HD," said ABC Sports spokesman Mark Mandel, "and we expect at least that many this year."

Jay Gleeson, manager of remote operations for ABC TV, said all the NEP trucks will use Thomson Grass Valley WorldCam cameras equipped with Canon lenses. Grass Valley switchers will control the video, all recorded on Grass Valley VTRs. The HD gear will be backed up by several Sony slo-mo cameras, plus a Panasonic camera for the ESPN SkyCam, a Panasonic POV, and Harris encoders and decoders.

ABC Sports will use Canon lenses to capture all the action at Super Bowl XL.

HI-DEF RF

ABC Sports plans to use at least one hi-def RF camera, Gleeson said. At press time, it had not yet been decided whether to use a camera supplied by Link Research in the United Kingdom, (represented in the United States by Ariel Video System) or one from Total RF in Bensalem, Pa. Both of these handheld cameras performed well, he said, so the final decision will hinge on pricing.

"The HD RF camera selected will be all over the place," Gleeson said, "We'll go wherever we can't get with a cable camera, especially behind the benches where running cable is a major issue for the teams. We also will be able to walk up into the stands to get shots of the fans or see the game from their perspective, providing we can do this without blocking the view of the fans behind us, or we may go out to the concession areas."

ABC's biggest challenge with the RF camera will be the lack of any return video for the camera operator to frame shots incorporating

SUPER BOWL, PAGE 19

LETTERS

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

CONTINUED FROM PAGE 4

representative. His statement that the NFL "hires" Telex to supply its BTR-600 Wireless Coaches Intercom system and the referee mics used to call penalties from the field is not correct.

To the contrary, the NFL owns all of the equipment throughout the league that it has purchased from Telex with some of it coming from other vendors as well. The NFL contracts with Telex to provide maintenance and repairs when necessary for its equipment.

In addition, Mr. Egenberger of the Pro Audio Group suggests that they manage frequency coordination, when in fact their selections take into account just the needs of the coaches' intercom, which are coordinated by the GDC for every venue in the league, including playoffs and Super Bowl.

For example, the referee wireless system for the Super Bowl will be the Detroit Lions equipment that is now in place and already coordinated by the local GDC. In addition, the coaches intercom will be that used by the Lions and has been coordinated from the beginning of its installation a number of years ago. The local GDC will suggest Telex change frequencies if any of the intercom or referee's mic frequencies experience interference from local broadcast stations, which have priority. Telex will then change the affected frequency to something more compatible with local operations based on the recommendations by the GDC.

Frequency coordination at Super Bowl uses an extensive tagging system of coordination approval for all wireless devices. Our coordination engineers will be stationed at all of the entry points into the secured perimeter of the stadium to verify that all RF devices are included in the frequency coordination process by recognizing wireless devices that are not tagged and therefore not coordinated.

We will be training other security personnel that operate the magnetometers at the entry gates to acquaint them with the RF tagging system and what RF devices look like that should be singled out for non-coordination.

The RF "check-in" on media day and game day will include four to five spectrum analyzer teams working with the coordination database, frequency counters and special tag personnel. All RF users will be checked in to verify that they are operating on their coordinated frequency, their equipment is operating correctly and their equipment is tagged as being checked in.

In addition, we will have three direction-finding crews with RF equipment on the field as well as runners on all levels of the stadium to interface with operators of interfering equipment.

TV Technology magazine is a highly respected source of information to the engineering public, and as such, I'm confident they would not want to be party to misleading and partially incorrect information.

Thank you for understanding our concern.

Jay Gerber
Manager,
NFL Frequency Organization Group

Super Bowl

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graphics, Gleeson said.

"We had two vendors come up with possible solutions, but things did not work as we'd hoped," he said.

ABC Sports next considered having someone with a small RF monitor walk with the camera operator, he said, "but then the camera operator would have to look away from the eyepiece to consult the external monitor to frame a shot, and we can't have that. So, because at this late date we do not expect to find a solution, we're going with no solution."

Instead, Gleeson said, the director will have to talk the RF camera operators through each shot, telling them to tilt or pan to accommodate the graphics with various game stats. Another option might be to frame an RF camera shot within an insert window.

ABC Sports also experimented with a point-to-point cable camera on a boom 15 feet above the sidelines at a pre-season game in Ford Field last August. A Panasonic 800 HD camera was rigged and operated by the SkyCam crew.

"We found that, as when camera and crew went up and down the field, they kept getting in the way of the fixed camera positions, which was more annoying than anything else. This was going to be our big flashy technical innovation for the Super Bowl this year, but after we'd actually tried it in the same venue as the Super Bowl, we had to let go of that idea," Gleeson said.

ABC Sports will field test the Sony advanced prototype HD super slo-mo camera system, according to Robert Willox, director of marketing for content creation at Sony Electronics. He said the world's first 3x super slo-mo camera captures video at 180 fps in multiple HD formats, from 720p to 1080i, "so the camera will be useful for NBC or CBS the next time they air the Super Bowl." Several engineers from the Sony design center in Atsugi, Japan, will baby-sit the prototype during game, according to Willox. Sony also is providing its Cinealta HDW-F900 camera, which will shoot HD 1080p at 24 fps for archive material to be created by NFL Films.

LENSES

The camera lenses at Super Bowl XL will reflect the latest technical improvements, said Gordon Tubbs, assistant director of marketing for the broadcast division of Canon Broadcast USA, provider of all the lenses used in six Super Bowls.

Supporting close-ups will be box-style XJ series 75x, 86x and 100x lenses, including the new HJ18ex28B lens, used for the stationary cameras and the smaller remote-control cameras mounted on the crossbeams of the goalposts. The cameras on the field and in the locker room will use HJ series ENG-style portable 40x telephoto or 2:1 zoom wide-angle lenses. The super slo-mo cameras will use a combination of these lenses, Tubbs said.

"The biggest thing this year is that all of our high-end lenses now feature Canon's advanced Optical Image Stabilization system," he said. "Image stabilization built into the lens is critical for a sports event like the Super Bowl, where the director needs really long shots with extreme close-ups of the player's faces."

Willox said HD itself now makes it possible to deliver those close-ups in greater details than ever before.

"In the old days, the cameras could barely penetrate the shadows under the helmets, so the players all looked like Darth Vader. Now, because of HD, you not only can see the sweat on their faces when watching at home, you see their state of being, which brings a whole new emotional level to viewing the game," he said.

Yet for all the blessings of HD gear, ABC Sports still faces some major hurdles in broadcasting Super Bowl XL from Detroit in mid-winter.

"Our biggest challenge may be the weather," Gleeson said. "All those under the dome in Ford Field will be toasty warm, but what about all the people out in the parking lot? If they have to troubleshoot a cable that's buried under ice, not only will they have to contend with the cold, but they could do more damage to the cable than anything else. Or else suppose someone steps on an audio cable? That crunching sound underfoot may be the brittle cable breaking, and then what happens to the audio signals?"

Gleeson said ABC Sports and NEP are backing up everything, "but there could be problems from slower recovery time in the cold weather."

ABC explored covering the entire compound with a big tent, but the city of Detroit objected because driving long metal stakes into the pavement risked hitting underground electrical conduits. After an ice-skating rink dome collapsed under heavy snow in Europe late last year, "that whole idea went away," Gleeson said.

Another challenge will be the outside cabling.

"In the past world of SD," Gleeson said, "you could run triax cable forever, but you can't pump an HD signal much more than 2,500 feet. Since the trucks will be 900 feet from the outside input-output panels at Ford Field, this poses some real difficulties for us." Hoover at NEP agreed that the weather may pose some obstacles. "We expect that it's going to be quite cold in Detroit in February, not quite like being in Florida last year. So, I worry about the wires and cables freezing." ■

Video Profiles & Perspectives

Automating the Newsroom

Consider workflow and program destinations

by Harlan Neugeboren

STAMFORD, CONN.

Newsroom automation has been around for a number of years and many stations have adopted it and reaped the many benefits of doing so. Unfortunately, many stations have not automated their newsrooms mainly due to lack of funding/justification and uncertainty about the future of acquisition technologies. Auto-mation needs to be looked at as a philosophy and workflow and not just a technology decision. Many of you are probably saying "my workflow is just fine, I get the news on the air and I get decent ratings so why do I need to change anything?" How about increased competition from other media outlets and declining viewership for starters?

In order to be strategically positioned for the future, you need to view yourselves as content creators and not as just a TV station. This means that your whole workflow needs to support distributing content to multiple platforms in as an efficient manner as possible.

The first step in determining what you need to automate is to look at your current workflow and determine how many people and steps it takes to get any content through your system.

GETTING STARTED

The first step in determining what you need to automate is to look at your current workflow and determine how many people and steps it takes to get any content through your system.

Your viewers may view your content on their TV, computer, media center, iPOD or cell phone. Therefore you need to look at what you are shooting, what's usable, what is making it into a story or what other stories could be produced with a little pre-planning.

Another area to look at is "who's doing what"? Do I have graphics operators running a CG at showtime? Do I have playback people? Am I using AD's? Prompter operators? While all of these people fulfill current needs, how can I re-allocate them to support additional distribution platforms?

Your newsroom computer system is the heart of your automation system. It can be viewed as the "Air Traffic Controller" of your system and will allow you to take advantage of the many benefits of automation. Thanks to the MOS protocol you can do the following from your NRCS:

Create graphics via templates from vendors like Chyron, Vizrt, and Pinnacle/Avid;

Edit proxies or full resolution video via editors from Avid, Omnibus, Apple and Ardendo;

Create record clips on servers from Omneon, Grass Valley, Avid and 360 Systems;

Download and modify rundowns on automation systems from Sundance Digital, Omnibus, Avid and Pebble Beach.

All of the systems listed above support the MOS protocol and allow you to connect your NRCS to a large number of devices and transfer key metadata such as story name, reporter and location to your production system.

THE ASSIGNMENT GRID

The planning grid or assignment queues are probably the most underutilized automation tool you have. ENPS and iNEWS allow you to create an empty record clip for field assignments. When a feed comes in, the operator loads that clip into the record window and all of the metadata that you entered in the assignment grid is available in the record clip. This means no more Fire 1,2,3 stories. Each story has a unique name and metadata. This same methodology applies to field stories. When a reporter comes back from a story, they call up that record clip and ingest the media into that blank clip. Again, the metadata follows. ENPS, through its Snap Feed product, allows journalists in the field to access these same record clips and transfer their story via ftp into a server back at the station.

MEDIA MANAGEMENT & ARCHIVE

One of the most misunderstood areas in production today is media management. There are many media management systems from companies like Avid, Ardendo, Blue Order, Cinegy, Harris, IBM, Konan, Omnibus, Proximity, Sundance Digital and White Plains that allow you to ingest, categorize, annotate, view and move media assets. Media assets include graphics, audio files, animations and raw and edited material. There is another component of these systems called HSM (Hierarchical Storage Management) that sit between your media management system and storage devices like disk drives, DVD jukeboxes and data tape archives and control the movement and indexing of your assets on these systems.

The price of the media asset management system usually depends on the number of functions your system is performing: ingest, proxy generation, scene detection, closed caption indexing, control of data tape archive, etc. All of these functions add complexity and cost to the system. You need to determine what you want to do and which toll will best perform the tasks.

Finally, the most important part of building an asset management system is developing a metadata schema that works for you. The SMPTE 335 Metadata standard is a good place to start (*www.smpte-ra.org/mdd/rp210-4.pdf*).

Also, talk to your NRCS vendor to

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001 ://

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Automating

CONTINUED FROM PAGE 20

determine what data can be exchanged between their system and other systems like asset management and servers.

STANDARDS, FILES & STREAMS

By using standard formats such as DV25, DV50, DV100 (HD), HDV and other standards-based HD formats, you enable the use of a wide number of acquisition, editing, serving and storage systems.

Standards should also be applied to software and hardware, especially when looking at the system as an IT based system and not a video based system. You are dealing with files and there are many devices that support file storage, serving, and sharing. Many companies make SAN or NAS systems that can support the basic storing and sharing of video files. For many applications such as editing, you can use non-broadcast storage and hardware. If you build your system correctly, you should easily be able to use both broadcast and non-broadcast hardware and software and be able to easily access or transfer files on each system.

FIELD ACQUISITION: IT'S SOLID

The reason many people shy away from non-linear editing is due to the fact that in many cases, you can shoot and edit faster on tape. However, as a content producer, you need to look beyond the "story" and consider all the uses for a piece of content. By using solid state recording technologies, you can record material onto a disk drive or memory card and take advantage of disk transfer speeds to get your material onto a shared storage environment. If your particular camera vendor doesn't offer a filed-based record option, Focus Enhancements has a product line called FireStore that allows users to connect a hard drive to almost any camera that supports FireWire. They also can record the video in the format that your edit system uses, allowing you to simply mount it as a drive on your editor and edit away: no file conversions and transfer time.

Begin the planning process by forming a team to manage the automation project that includes members of the different areas in your station: graphics, editing, field, engineering, IT, promotions. By soliciting input from each of these groups, you will be able to design a system that will match your desired workflow. The most important member of this team is the project manager or team leader. This person should have knowledge of both the editorial and technical areas but more importantly is viewed by their co-workers as someone who gets it and knows how to get you there.

Meet with your NRCS vendor to discuss the capabilities of their system and workflow processes they have to increase the efficiency of your newsroom. ENPS and iNEWS both have the systems or connection to systems to allow you to automate your newsroom and for the most part, are vendor agnostic. They support a wide number of vendors for graphics, editing, serving, asset management and storage and approach most situations from a "what vendor will best support the desired workflow" perspective.

Finally, do a lot of research. Talk to your contacts in the industry who have installed automation systems to learn what worked and didn't work. Look at the world of broadband content distribution and companies like The Platform, Maven, and Extend Media to see what they have to offer. Many companies offer hosted outsourced solutions for distributing content. Do a Google Search for automation systems, content management, etc. There's a lot of good information out there. ■

Neugeboren is a consultant based in Connecticut and was previously the principal technical architect of Time Warner's 24 hour local news channels.

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André V. Mendes

Project Management In a Brave New World

Recently, after a couple of temporary setbacks in some very important projects, I was reflecting on the profound differences between the large scale technology deployments that I have been involved in during the course of my career and the projects that we are tackling today. What a difference a few years make.

In the early 1990s, while heading software development for a very large travel agency, my department was tasked with linking our internal database with the reservations data from the four largest airline reservations systems (Sabre, Apollo, WorldSpan and Amadeus). The explicit objective was to electronically reconcile the auditor's coupons from each of our 6,000-plus field offices without having to resort to the manual matching of every single ticket. In the old process, each office weekly Fed Exed (yes, it is a verb!) every single ticket to our central office where legions of workers would manually match these stubs with the ones that we printed in our back room. These were then mailed to the Airline Reconciliation Company, which would then match these paper coupons with their own internal records from the airlines.

This daunting task was approved, requirements were defined, flowcharts were prepared, and timelines were delineated. Despite its inherent complexity and enormous scope, this project had few and very well-defined system interface points.

All of the systems ran on our large-scale IBM AS/400 systems, one operating system (OS/400) that was updated at most once a year, one language (RPG/400) that was at least 15 years old, one database (DB/400) and one large application.

The file structures for the four reservations systems were complex but relatively stable, the connectivity between sites was composed of established point-to-point circuits and the requirements were set in stone.

A squadron of programmers was allocated and the work started in earnest. Two years later, three weeks late but under budget, the system was launched without much fanfare and ran with few changes for the next eight years. It saved the company and the airlines millions of dollars and because of its long life and paid for itself many, many times over. Ah the good old days!

MOVING TARGET

Compare that with today's large integration projects in the digital media realm. If you are involved in such a project, you are likely dealing with a completely different set of circumstances from the first day of the project to its eventual conclusion.

To start with, your project will be expected to pay for itself in a much shorter timeframe, three to five years is typical. With ever shorter technology cycles, the project requirements will possibly shift and change several times between initial concept and final deployment. Because we are no longer picking the low-hanging fruit that is so characteristic of initial deployments, you will often be dealing with well-entrenched fiefdoms that perceive your project as being extremely threatening to their existence; and to top that, it is very likely that the mission criticality of your project will have a substantial impact on your enterprise should it fail to produce the necessary results.

One would figure that those circumstances would be enough to scare even the bravest souls, but these issues are just the beginning. You will now have to deal with all of the interoperability requirements of a new computing environment where the very same flexibility and adaptability that enable such creative solutions to take shape, will increase the overall complexity and therefore the overall risk of your project by a couple of orders of magnitude.

In all likelihood, you will be dealing with several versions of operating systems, multiple databases, languages and applications that are updated on a monthly basis and an assortment of connectivity, security and access-control issues that must be addressed.

The old batch processes of yore will probably be replaced by highly interactive applications that provide end users with the expectation of almost immediate feedback on even the most complex of updates. What normally would take hours or even days to percolate through older systems is now expected to be available on their screen a few seconds later. And of course all of this has to happen in a multi-vendor environment where the choreography of metadata is just as important as your program content.

Whereas before you had access to the proverbial "One throat to choke," you will now be required to have the diplomatic skills of a secretary of state just to ensure that your vendors and their respective products will interact. The same skills are needed with your internal customers. As we evolved from basic infrastructure projects that provided basic functionality to the higher layers of enterprise integration, your constituency is now heavily involved in every nook and cranny of the requirements, the design process and the end-to-end workflow of all of the applications.

Above all, I would emphasize the importance of educating your senior management colleagues on the inherent risks associated with modern technological deployments, preferably before the projects start and then multiple times during its gestation.

The challenges are obvious. Since your target population encompasses large portions of the staff, they will run the gamut from end users whose focus is too narrow to understand the whole system, to consummate professionals that fully embrace the entire project and even to super users that further enhance your original designs. They are all crucial to the project's success yet require radically different handling and depth of involvement. You should strive for an early understanding of these different audiences.

Despite all of this, you should not get discouraged. All of these issues clearly point to the fundamental role that technology now plays in any modern enterprise and the relevance of your role within a given company. After all, technology is nowadays the lifeblood of most enterprises.

Above all, I would emphasize the importance of educating your senior management colleagues on the inherent risks associated with modern technological deployments, preferably before the projects start and then multiple times during its gestation. Continually managing their expectations and reiterating the importance of their support might just be the most important tasks in your project timeline.

Project management is not what it used to be. You can count on IT!

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

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TUNING IN

Gary Arlen

Playing Around in Immersive Sales

A baseball game with the Trix Rabbit on the pitchers' mound, the Lucky Charms Leprechaun on base, and fielders including "Sunny," the CocoPuffs cuckoo bird, "Count Chocula" and the HoneyNut Cheerios bee might not be everyone's bowl of breakfast cereal.

But for General Mills, the multibrand promotion, which came in the form of a CD-ROM videogame, was a hit. It generated three times the "usual response" of traditional marketing campaigns, and scored high among its target 6- to 12-year-old customers, according to Jim Wexler, executive vice president of Brand-Games, the New York City firm that designed the games for the cereal maker.

The Castrol brand is featured in the "Need for Speed Most Wanted" video game for XBox 360.

The videogame itself was a high-resolution computer game that let kids control familiar animated characters through a full-featured baseball game, which was sanctioned by Major League Baseball. The game promotion was part of the General Mills marketing pact with MSB.

Equally significant, Big G cereal's "advergaming" project earlier this year was a high-profile component in the effort to integrate advertising and marketing campaigns into video entertainment. The Yankee Group research firm estimates that such in-game advertising will reach $153 million next year, nearly triple its 2003 level. By 2008, advergaming revenues will hit $260 million, Yankee Group says.

Meanwhile, a study unveiled last month by Nielsen Interactive Services and Double Fusion, an Israeli advergaming developer, found that an in-game ad campaign raised the awareness of some featured products by as much as 60 percent. In particular, players of the "London Taxi" videogame were twice as likely to recognize and recall 3-dimensional billboards as they drove through the virtual streets of London, much to the delight of Procter & Gamble, which test-marketed a new car care product in the game trial.

For now, most convergent advergaming ventures are running on CD-ROM and Web-based delivery, especially broadband connections. But the lessons being learned in this explosive and immersive category are likely to shape the ways that next-generation marketers and video producers deal with digital selling—including future interactive TV services. As multicast digital TV becomes widespread, and as the gamers generation looks toward the TV set, you can expect a growing appetite (or at least a tolerance) for interactive games that include real products for sale.

In fact, several recent studies underscore the appeal of "real" products in games. Nielsen Entertainment and Activision, a major videogame publisher, contend that 67 percent of gamers believe that in-game ads from recognized merchants make the games more realistic. Their research also found that 40 percent of male gamers say that in-game ads influence their purchasing decisions.

Madison Avenue notices those kinds of results, especially coming from the hard-to-reach young male demographic. But various types of advergaming extend to "casual gamers," the coveted—and fastest growing—category of player—namely women, especially high-consuming young mothers. Marketers like to reach shoppers in an entertaining milieu, which is why Coca-Cola, Visa, Home Depot, Bed Bath & Beyond and every major automotive company has plunged into advergaming. Visa's current snowboarding game lets players win tickets to the Torino Winter Olympics next year.

There are even collaborative joint ventures, such as an online advergame

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Immersive

CONTINUED FROM PAGE 26

for Chrysler's Town & Country minivan. Players must load a vehicle with kids and cartons of branded boxes from retailers. As packages of various sizes cascade into the screen, Tetris-style, the player has to arrange them so that everything fits into the virtual van with no wasted space.

For Chrysler, the objective is to show how much can fit into its minivan—and to get the name and contact information from players so that it can follow-up with a sales call and test drive.

Dave Madden, executive vice president at WildTangent, the Seattle videogame developer that created the Chrysler advergame and many others, believes that interactive advertising is an ideal way for marketers to measure return on their investment. Like other advergaming promoters, Madden stresses the value of integrating interactive game campaigns with larger media and marketing initiatives.

GOING TO THE DOGS

Purina PetCare followed that approach in its "Incredible Dog Challenge," which included a videogame CD-ROM packaged with bags of dog food. The game allowed pet owners to take a dog's-eye view of the competition, running through a maze and jumping over hurdles. About 20 percent of the customers who got the disc eventually played the game, which was tied into the widely promoted "Challenge" event and the TV show.

In these and other ventures, video from TV shows is integrated, where possible, into the game—raising other prospects for shooting video intended for repurposing via alternative outlets.

This multi-platform approach to integrated media/marketing brings new perspective to the eternal "convergence" debate. Truly, some advergaming tactics are little more than glorified product placements, which have been part of the videogame environment for nearly two decades. For example, promotional posters for real brands have been "pasted" along the walls of virtual arenas and stadiums in sports videogames since the first Nintendonaut kicked a virtual soccer ball or manipulated an ersatz quarterback.

The new momentum for advergaming, though, goes beyond static ads. It crosses the threshold into immersive marketing, where the product itself is the game vehicle. As marketers—already queasy about ad skipping on digital video recorders—seek new platforms to reach their prospective customers, integrated and involving advergames will have more appeal. Their products can always be in sight of the consumer, and the interactivity enables real-time sales, or at least, a shopping opportunity at the end of the game. (One lesson that in-game marketers have learned: don't interrupt game play to make a pitch.)

High-speed access is already triggering massive multiplayer games, which is the industry's most celebrated "next big thing." And the arrival of Microsoft's XBox 360 and Sony's PlayStation 3 offers even higher definition and more immersive opportunities to put players into the selling environment. Meanwhile, in the online world, a WildTangent study last month, conducted with Eyeblaster, a games technology developer, found that 78 percent of players would watch a short video (that is: a commercial) in exchange for free games.

All of this adds up to a revamped ad/entertainment arena—with ripple effects throughout the TV business. As convergence rises—or sinks, depending on your viewpoint—to new levels, advergaming will play an increasing role in the way that marketers reach viewers.

Gary Arlen is president of Arlen Communications Inc., a Bethesda, Md., research firm that has tracked media technology since the days of two-inch videotape. He can be reached at Garlen@columnist.com.

Photo: Steve Jordan

THE BIG PICTURE — Frank Beacham

2005: The Year TV Broke Out of the Box

At the beginning of 2006, we are at an exciting juncture in the history of television. Even as the old aristocracy attempts to cling to what was, the emerging new technology won't be tamed, controlled, or mandated by Congress.

These are exhilarating times, especially for the television creators who have long chafed under the bottom-line-feeding gatekeepers. Bob Dylan nailed the situation well when he penned the lyric: "...something is happening here. But you don't know what it is. Do you, Mister Jones?"

SYSTEM MELTDOWN?

It was quite a spectacle watching legislators go through their annual year-end backroom ritual, negotiating the minutia of DTV broadcasting while—in the reality-based world—the entire traditional television distribution system was in meltdown.

In the last three months of 2005, more happened to change television than occurred in the 20-odd years of the clueless "DTV transition." In short, TV broke out of the box. And it's never going back.

Of course, it had been building throughout the year. From the historic summer Webcast of Live 8 to the migration of television news to the Internet after Hurricane Katrina, the shift away from traditional distribution rapidly evolved from month to month.

But it was Oct. 12 when the "big bang" occurred.

That was the day that Apple Computer's chief visionary, Steve Jobs, introduced the first iPod with video playback capability and a new version of iTunes that offered major television shows and other video programming for download at $1.99 a pop.

Apple's video iPod represented the "big bang" for a la carte video.

Boom! In only 20 days, Apple's customers bought a million video programs. The era of *a la carte* video arrived spontaneously, without the help of the cable companies or FCC chairman Kevin Martin.

"Selling one million videos in less than 20 days strongly suggests there is a market for legal video downloads," mused Jobs. "Our next challenge is to broaden our content offerings, so that customers can enjoy watching more videos on their computers and new iPods."

That, he did. By year's end—in less than three months—iTunes had sold 3 million videos. Also, significantly, what began as a handful of primetime ABC programs rapidly grew to more than 300 episodes of more than 16 popular TV shows. A flurry of deal-making will have pumped up this number by the time you read this.

THE RUSH TO PARTICIPATE

None of this gold rush was lost on the owners of television programming, ranging from the broadcast and cable networks to small independents. As established players scrambled to make a deal with Apple for new distribution, others were looking to mobile phone carriers to distribute their programs over new 3G networks.

Apple's success sent a real jolt of excitement through the independent video community. Now, a clear path is emerging that will enable video distribution to the end user without the need of television broadcasters and pay TV networks.

Some compared it to what is happening with music distribution. Many artists are finding success today outside of traditional record companies, choosing to make and self distribute their recordings directly to customers over the Internet.

Now, with affordable camcorders and desktop television post-production technology, programming can be made outside the traditional studio environment. It can then be marketed and distributed directly from a Web site.

Even self-distribution is being simplified. For example, America Online has joined a Massachusetts company, Brightcove, to create an automated distribution system that would allow independents to distribute their video over the Internet without the need to negotiate special contracts.

To simplify the distribution process, the proposed AOL-Brightcove system will offer a standardized revenue sharing deal that is activated after a program is uploaded to their server.

In observing this shift, it is interesting to note that the traditional broadcast networks are justifying their move to new outlets with the argument that—at least for now—Internet distribution is not affecting traditional broadcast viewership.

In fact, NBC-Universal Television CEO Jeff Zucker said that fact was an important reason NBC joined Apple's video distribution platform. During an interview with The New York Times, Zucker forecast that his network is about to break out of the box to several new television distribution platforms.

"A year from now, you will see us on ever more platforms," Zucker said. "Whether it is a cell phone or an iPod or a computer, we don't care what screen it is."

We suspect that when most TV programming is available *a la carte* and on-demand, that Internet distribution will affect traditional broadcast viewership. Wonder if Mister Jones will have figured it all out by then?

Frank Beacham is a writer and producer based in New York City.

PRODUCTION MANAGER — Craig Johnston

Smaller Cameras Present Peripheral Gear Problems

I've been talking a lot lately with field TV gear makers, and some of them are frustrated. They want me to relay a message to you: not everything scales.

Translated from business-schools-speak, that means that just because one piece of equipment gets smaller and/or cheaper, not every piece of equipment you'll need is going to get smaller and/or cheaper.

For instance, a fluid head/tripod maker told me that when cameras cost $30,000 and up, people thought $5,000 and up was an okay price to pay for his product.

But now that an HDV camera is less than the $5,000 they used to pay for the fluid head and tripod, buyers think the price of the head and tripod should be more like $1,000 or less.

He asked me to pass along a couple of facts. First, the same market forces that sent the price of equipment like cameras plummeting are not acting on products made out of materials like metals and composites. There's no Moore's Law in non-electronics manufacturing.

Yes, but you point out that not only have the cameras gotten cheaper, they've also gotten lighter. Shouldn't the price of a piece of camera support equipment be coming down because you're asking it to do less?

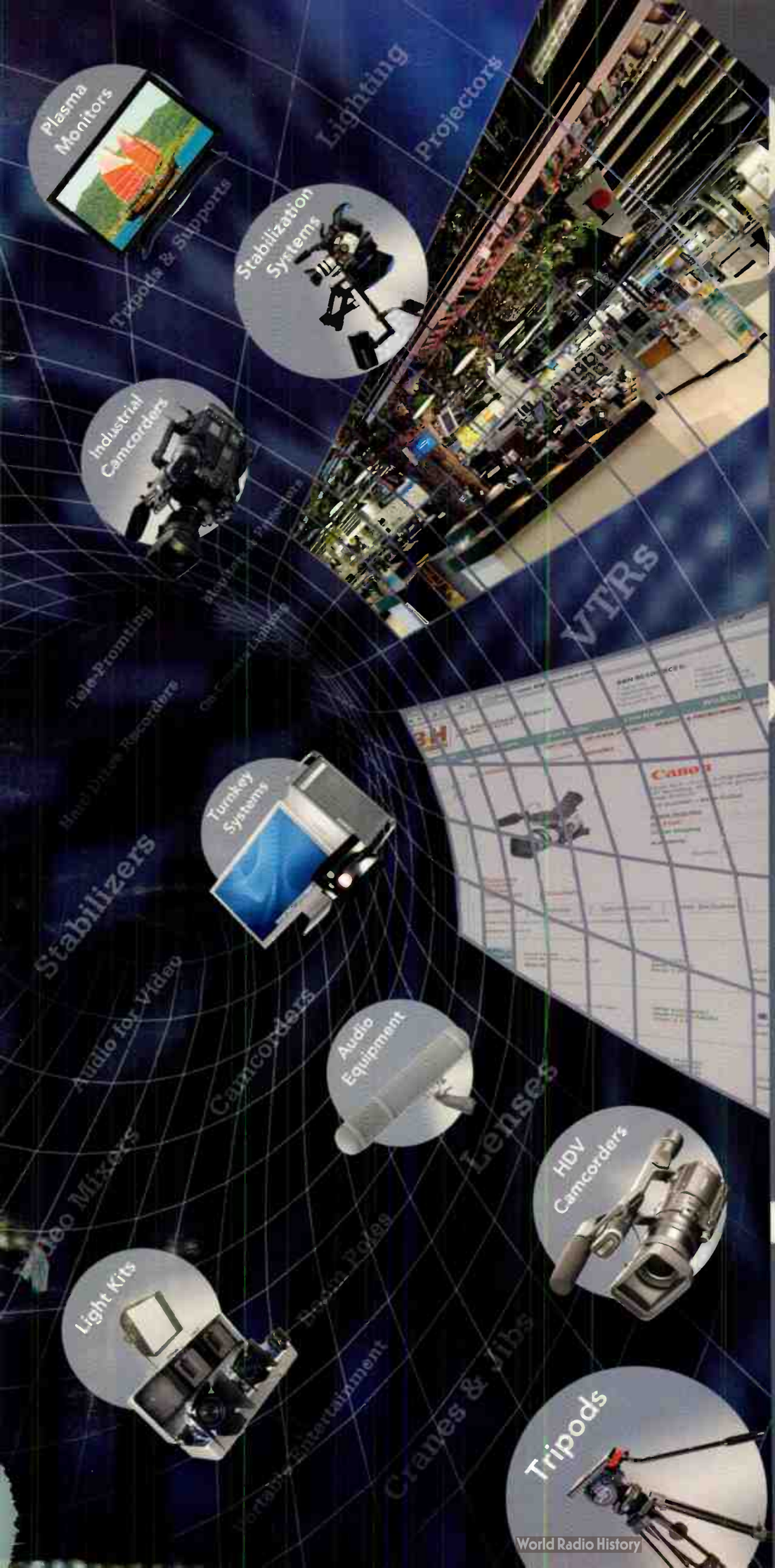
Specifically, if you're asking a tripod and head to support a Sony HDR-FX1 Mini-DV Digital Camcorder, which weighs less than 5 pounds versus the 20-plus pounds the older tripods were designed to support, shouldn't the new tripods be cheaper?

My tripod maker friend pointed out it's not that simple. He said videographers are demanding that the lightweight cameras pan-and-tilt smoothly, like their heavier predecessors.

Problem is, the lesser mass of the HDV camcorder can actually make it harder to achieve smooth moves, just like it's harder to steadily hand-hold a small camera than a bigger, heavier one.

So the fluid-head makers faced a new challenge—developing a drag system that mimics the weight and mass of those heavier payloads. (In fact, though the fluid-head maker didn't bring it up, the length, from the front of the lens to the rear of the battery would also provide stability through a pan-and-tilt. That would have to be factored in.)

PERIPHERAL, PAGE 39



INTO THE SOURCE

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DIGITAL TV

Charles W. Rhodes

Tie Up Loose Ends Before Making New Resolutions

Before I make any New Year's resolutions, I want to tie up the loose ends that accumulated in 2005. I've covered most of the details of measuring DTV TPO (transmitter power output). Those loose ends involve the proper use of a spectrum analyzer as the power output measurement instrument. I've always said that a spectrum analyzer can mislead the unwary user more ways than a cat has lives:

1) By now you know that your choice of resolution bandwidth strongly affects the indicated power within the channel. The analyzer's RBw (resolution bandwidth) is small compared to the DTV signal bandwidth—5.38 MHz. As the DTV signal power is evenly distributed across its 5.38 MHz of bandwidth, if the RBw were 0.538 MHz, it would read 10 dB low.

Your range of choice of RBw was determined by the manufacturer. The smaller the RBw, the longer it takes to analyze the power distributed across the channel, but the more detail in the resulting spectrum plot.

This gets really important near the edges of your channel. Try this: Set RBw to 1 MHz and observe your DTV signal. You might panic when you see a lot of signal energy outside of your channel, and try as you might to reduce this out-of-channel energy, your analyzer is giving you a false impression. Now reduce RBw to, say, 0.1 MHz and you will find that your DTV signal fits nicely inside your channel. Note that a DTV signal is quite unlike NTSC in this respect.

Since my Oct. 21 column was published, Congress has started to take action to deal with the subject of 24/7 DTV EAS in all media.

But there is a little more to it. The frequency selectivity of your spectrum analyzer is determined by a real-life filter, and its frequency selectivity is not rectangular but like that of a tuned circuit, sort of Gaussian.

There is a correction factor for the RBw to be added to (10 dB in the example above).

Not all spectrum analyzers have the same selectivity characteristic, even if they provide the same choices of RBw. Having said that, I cannot tell you what the correction factor for your instrument is, but the manufacturer can. It is in the manual. It is a small number and is often overlooked, but when measuring your TPO, the devil is in the details, and you know how the FCC is about details. I suggest as a New Year's Resolution, you make up a table of correction factors based on the manufacturer's specification for your instrument over its range of RBw, taking into account its RBw correction factor and keep it where it would be hard to ignore.

2) But before you adopt this suggestion, there is a second correction factor you need to know about. This correction factor is due to the way your spectrum analyzer responds to a noise-like signal such as DTV compared to the way it responds to something in the analog world. Again, this correction factor can be found in the instrument manual, but it relates to the way your spectrum analyzer demodulated the noise-like signal to baseband. It is a small number, but should not be ignored in making TPO measurements.

I want to thank Mr. John Tremblay of Larcan for his informative booklet "Digital Translator Handbook," which so clearly explains these fine points. Finally, I must repeat my admonition that the real limit to your TPO is the sideband splatter being generated in your DTV transmitter. You most keep your TPO below the level at which your sideband splatter is at or less than the limit set by the DTV RF mask. I understand that Gary Sgrignoli and many others are working on an IEEE standard for making these compliance measurements. I don't know when the IEEE will approve and publish this, or if it will be the last word on compliance. Remember that the most important component of this sideband splatter is third-order intermodulation products. These increase 3 dB per 1 dB increase in TPO, so only small reductions in TPO change the sideband splatter significantly.

24/7 DTV EAS

Since my Oct. 21 column was published, Congress has started to take action to deal with the subject of 24/7 DTV EAS in all media. In fact, there is an appropriation in the works to fund the development of such a mandated EAS. I am very pleased that this step has been taken. I also learned that within the Enforcement Bureau of the FCC, this matter is receiving the attention it deserves. I believe this topic will be on the agenda of the Feb. 7 ATSC committee meeting. I was honored to be invited to attend this meeting, but alas, by then, I will be back in Oregon.

Last summer, my wife and I were at the Oregon seacoast when the tsunami alarm system was tested. A previous test failed; this one was declared successful. We were there and we never heard those sirens, and no one I met heard them either. A tsunami is caused by an earthquake beneath the ocean. If there were a way to detect the undersea earthquake, then the warning of a possible tsunami could be given much earlier, hours earlier. That would permit evacuation of coastal communities. The December issue of IEEE Spectrum featured an article on the ability to detect impending earthquakes electronically. Note I said impending, perhaps a few days even before the temblor that may launch a tsunami. The article reports that electromagnetic waves are radiated in the extremely low-frequency portion of the radio spectrum before earthquakes. These travel over great distances almost instantly to where they can be monitored and analyzed by computers.

For the first time, we may be able to detect a tsunami before the sea wave is launched. This development makes it all the more timely that we organize a 24/7 EAS for all media, the most universal of which is DTV terrestrial broadcasting. Broadcasters hold the key to our being able to evacuate threatened areas. If I couldn't hear those sirens last summer, I wouldn't be able to hear them when there is a tsunami threat. EAS should not have to depend on air raid siren technology of the 1940s but on the universality of digital broadcasting.

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

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THE MASKED ENGINEER | Mario Orazio

Hi-D! Hi-D! Hi-D! No?

You *might not have noticed* that all numbers are zero. There's a good reason you might not have noticed that, but I'll get back to that in a few shakes of an image stabilizer. First, I wanted to mention the purpose of this month's rant: proving that HDTV ain't color.

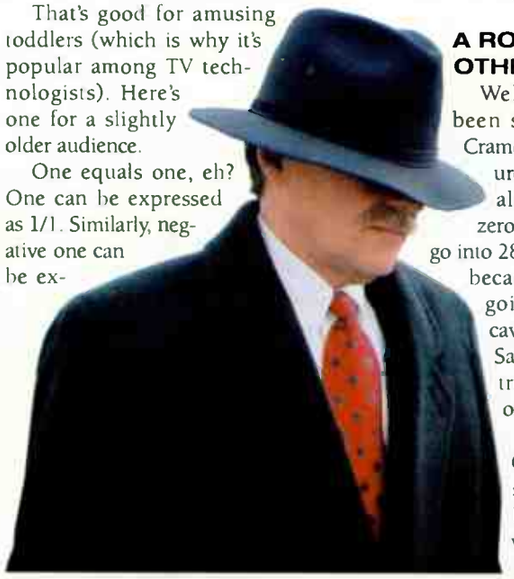
Okay, enough relevance; back to the numbers. Methinks Abbott & Costello had a routine about how seven into 28 is 13. Draw it out long-division style. Does seven go into two? Nope. Does seven go into eight? Yep, one time, and the remainder is one. Bring down the two, and you've got 21, which seven goes into three times, so the answer's 13.

You can prove it by multiplication: seven times three is 21. Seven times one is seven. Seven plus 21 is 28. Or try addition. Make a stack of seven 13s. Start counting down the right column: three, six, nine, 12, 15, 18, 21; then continue down the left column: 22, 23, 24, 25, 26, 27, 28.

That's good for amusing toddlers (which is why it's popular among TV technologists). Here's one for a slightly older audience.

One equals one, eh? One can be expressed as 1/1. Similarly, negative one can be expressed as -1/1 or 1/-1. Are you with me so far?

So -1/1 equals 1/-1. Take the square roots of both sides of the equation and cross-multiply, and you get the square root of -1 times the square root of -1 equals the square root of 1 times the square root of 1, or, to put it more simply, -1 equals 1. Add one to both sides, and you get 0 equals 2. Multiply by any desired factor, and you get all numbers being equal to zero.



A ROSE BY ANY OTHER NAME

Well, now, unless you've been sniffing an old can of Cramolin, you've probably figured out by now that not all numbers are actually zero, and seven doesn't really go into 28 13 times. But that's only because you've got enough going on in your cranial cavity to read this column. Sad to say, the same ain't true of a large proportion of HDTV owners.

Scientific-Atlanta, (er, Cisco?) commissioned a survey of 500 owners of HDTVs. Most folks who've read about the survey are most shocked by the finding that about half of them had no way whatsoever to get any HDTV to watch: no HDTV broadcast receiver, no HDTV cable, no HDTV satellite, not even a D-VHS machine.

Almost a quarter of the HDTV owners knew they were getting HDTV (even though they weren't) on account of the announcement at the beginning of the program.

Personally, I don't find that either surprising or a bad reflection on those owners. Maybe they just went into the store and asked for "the best you've got." Maybe they figured they might as well get HDTV now and watch it later. Maybe they figured an HDTV screen would improve their pictures enough (that's sort of what 28 percent of the owners said). All of those are legitimate reasons in my book.

I could even live with the statistic that 18 percent thought they didn't need anything besides the HDTV to get HDTV. Hey, I once heard of an accident victim who'd set the cruise control on his RV and then went back to fix a drink. You get something new, and you don't necessarily know everything about it.

No, the statistic that floored me was that almost a quarter of the HDTV owners knew they were getting HDTV (even though they weren't) on account of the announcement at the beginning of the program. It goes, "The following program is being brought to you in high-definition television." And there you have it. Maybe a survey of non-HD TV owners would show an even higher proportion enjoying this miracle of modern TV technology.

Before you laugh too hard, let me tell you that I've got a lot of sympathy for even those folks. "HDTV" is so misused that it's a wonder anyone's got a scintilla of an iota of a shred of an idea of what it means.

For instance, if about half of those surveyed couldn't get HDTV, that means about half could. The vast retail-industrial complex has decided that a HDTV set without digital-TV reception should be called an HDTV monitor, and an HDTV with digital-TV reception should be labeled "HDTV Built-In."

Methinks that's fair enough. But there is a bunch of non-HDTV TVs with digital-TV reception, and some retailers are calling them "HDTV Built-In," too. I am not making this up.

Now, then, not all retailers call those HDTVs without digital-TV reception HDTV monitors. Some call them "HDTV Ready" or "HDTV Compatible." Sound okay to you?

There just one small problem. What do you call a TV that's not HDTV but can handle an HDTV signal fed into it? Would you believe "HDTV Compatible?" There's also "HDTV Supported" and even an occasional "HDTV Ready."

NOW PLUG THAT HOLE

Now, then, those HDTV monitors have been sold for years—millions of them. And they've got analog-component inputs for getting HDTV signals. Except you can't always find a source with analog component HDTV outputs, and some legislators, egged on by Hollywood, want to "plug the analog hole."

That doesn't mean giving you a plug you can use to get analog outputs. It means eliminating those outputs.

Yes, analog component gave way to DVI. Then DVI gave way to HDMI. Now HDMI is giving way to UDI. What's that? You don't know what UDI is? Then how come you're laughing at those folks who think they're getting HDTV when they ain't?

Do you think you can tell the difference between HDTV and not? It ain't exactly like the difference between black-and-white and color. It ain't even like the difference between mono and stereo. And, if you shoot with too narrow an aperture or sit too far from a screen, you ain't going to see HDTV even if you've got the right kind of source and the right connections.

Maybe someday we'll drop this "HDTV" lunacy in favor of terms that make more sense. "Hey, look! This one has a better picture!"

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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RF TECHNOLOGY

Doug Lung

Crazy Enough to Build Your Own TV Antenna?

This month, I'll take another look at receive antennas for DTV. My article "Antennas for DTV Reception" in the March 6, 2002 column on antennas for DTV reception was published almost four years ago, yet hardly a week goes by that I don't get a request for Fig. 1, which shows the dimensions for a do-it-yourself UHF TV rhombic antenna. The article is available at *www.tvtechnology.com* in the Doug Lung on RF section. I've reprinted Fig. 1 here. Refer to the original article for information on how TV antennas work and suggestions for building your own.

Although I've received many requests for Fig. 1, I haven't received as many reports on how the antenna worked. I guess some readers found the size of the elements made construction more difficult than they thought or they built the antenna and weren't happy with the performance. As noted in the article, a rhombic that's five wavelengths on a side (about 100 inches at 600 MHz) will provide a predicted gain of approximately 12 dB. You will see later that smaller commercial TV antennas provide gains close to or greater than this.

RHOMBIC ANTENNAS

If you want to build a huge VHF TV antenna, an article from 1951 by Richard J. Buchan may be helpful, (See *http://members.fortunecity.com/wtfdamem/Rhombic1.html*). The antennas described are much bigger than the one I referred to. Buchan describes how a three-bay rhombic can be constructed with gain of more than 100 (20 dB). He notes that even though rhombic antennas are broadband, separate antennas will be needed for low VHF and high VHF, although the high-VHF rhombic can be strung inside the low-VHF rhombic using the same supports.

The article gives construction details, including a parts list, mast construction hints, dimensions and drawings for single bay and two bay antennas. If you want distant VHF-TV reception in a single direction and have the real estate, check it out!

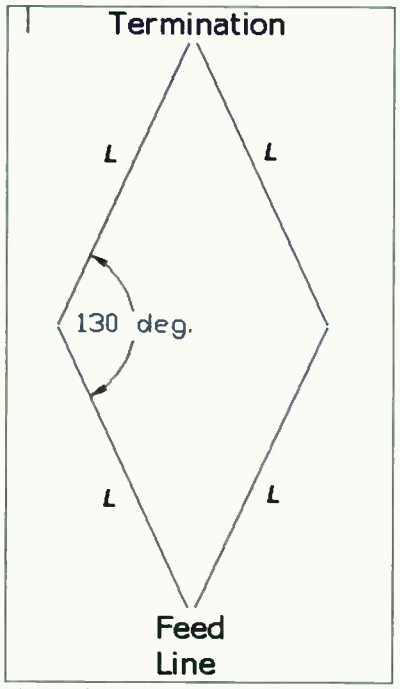


Fig. 1: Rhombic antenna

A "Dual Rhomboid" antenna developed by Edmund Laport of RCA was modeled by L.B. Cebik and determined to have gains between 15 and 16 dB at 1296 MHz. This design should be able to be scaled for use at TV frequencies, (See *http://www.cebik.com/vhf/rh.html*). In researching this article, I found what must be the ultimate UHF rhombic antenna, if it works as claimed. The Sveriges DX-Fürbund Web site (*http://www.sdxf.org/alfa/dxinfo/Antenna%20Articles.pdf*), has a 60-page article on antennas. On p. 35, there is a description of DHR (dual hexamerous rhombic) antenna designed for the 430 MHz band. It should work well at UHF frequencies. The calculated gain of the 2x6 rhomboid antenna is 33 dB! Unfortunately, author Wayne Sarosi said details would be provided in a future posting, but I haven't been able to find it. If anyone can provide details on the DHR antenna, please e-mail me and I'll share the information.

Broadcast engineer Jeremy Lansman at KYES in Alaska has put together an excellent Web page titled "About TV and FM Antennas" at *http://kyes.info/antenna/antennadex.html*. The page contains links to articles on how TV antennas work, common TV and FM antenna types, and, of relevance to this article, a section devoted to building your own TV or FM antenna.

PRO PERFORMANCE

In my Dec. 14 RF Report (available at *http://www.tvtechnology.com/dlrf/issue.php?w=2005-12-14*), I reported that in the FCC's report to congress on the DTV field strength standards and test procedures for the Satellite Home Viewer Extension and Reauthorization Act of 2005, the commission found no specific changes are needed to the DTV field strength standards and/or planning factors.

The comments filed by the ABC, CBS and NBC affiliate associations in the proceeding included an exhibit by consulting engineer Jules Cohen with a survey of available TV receive antennas and amplifiers. In the report, the FCC cited this survey to show there are antennas currently available that meet or exceed the planning factor criteria. It should be useful if you decide to buy rather than build your own antenna. The affiliate associations' filing can be downloaded using the at *http://gullfoss2.fcc.gov/prod/ecfs/comsrch_v2.cgi*. Enter 05-182 in the "Proceeding" box and scroll through the listings.

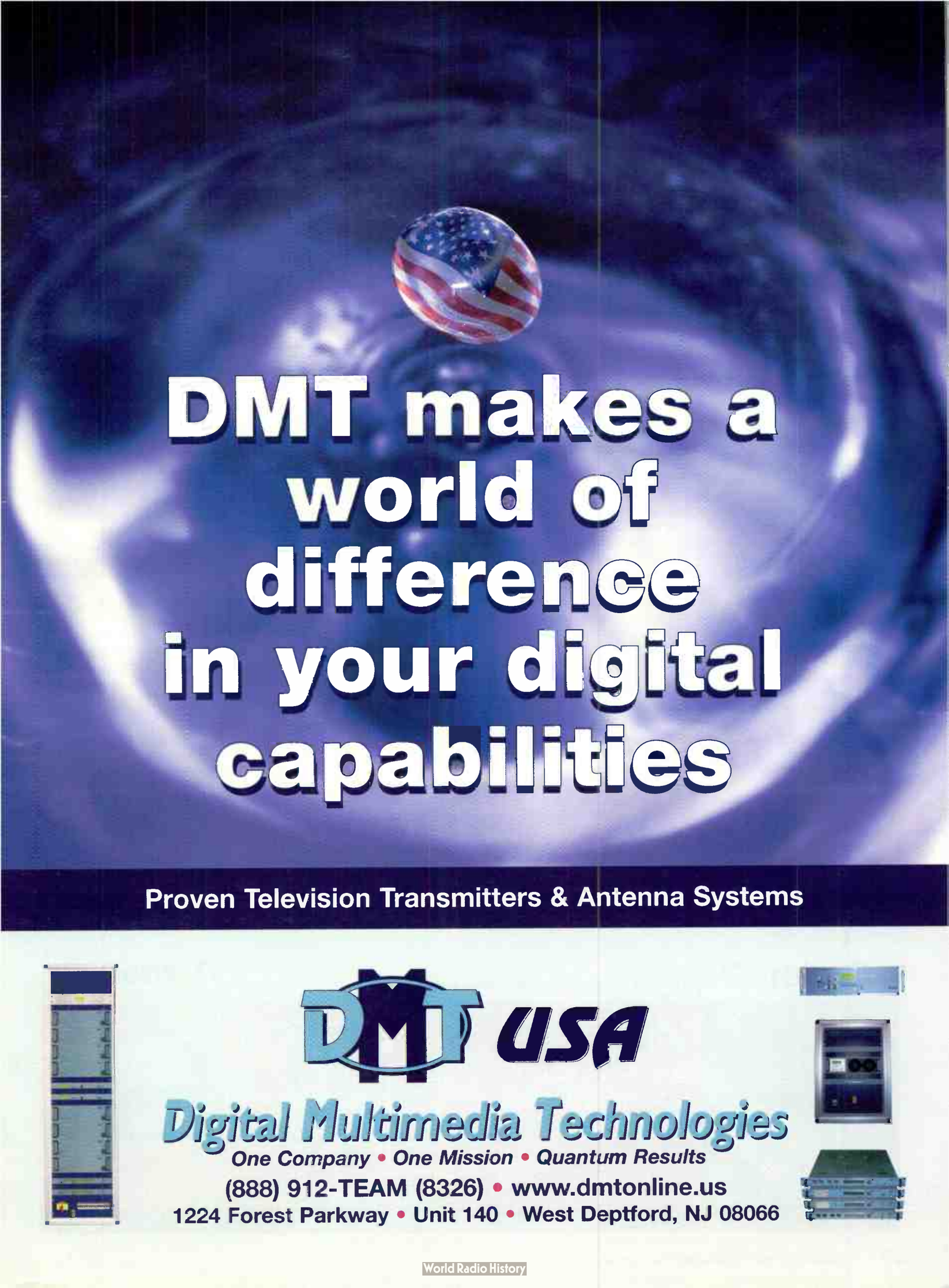
FCC DTV planning factors are based on antenna gains of 4 dB, 6 dB and 10 dB for low-VHF (Channels 2-6), high-VHF (7-13) and UHF (14-69) respectively. Kerry Cozad of Dielectric measured the Channel Master Model 4228 eight-bay bowtie-with-screen UHF antenna and measured gains of approximately 3 dB, 9 dB and 15 dB for low-VHF, high-VHF and UHF. This UHF-only antenna exceeds the planning factor gain at both high-VHF and UHF!

For VHF-only reception, the Antennacraft Model CS1100 claims an average low-VHF gain of 6.9 dB and an average high-VHF gain of 9.6 dB. The Channel Master Model 3610 doesn't do as well at low-VHF, with an average gain of 5.8, but provides a claimed average gain of 11.4 dB at high-VHF channels. While combined UHF and VHF antennas usually do not work as well as separate antennas, the Winegard Model HD7084P specifications show gains from 6.2 to 7.6 dB at low VHF, 10.8 to 12.0 at high VHF and 14.6 dB in the UHF band.

In a table in his exhibit, Jules Cohen shows that if a low-noise amplifier is used at the antenna, reducing the system noise figure to 4 dB, the media noise limited field intensity for DTV reception drops to 19.8 dBμ at low-VHF, 25.8 dBμ at high-VHF and 34.2 dBμ at UHF, based on receiving antenna gains of 6 dB at low-VHF, 10 dB at high-VHF and 12 dB at UHF.

In addition, CEA has an excellent Web site, *AntennaWeb.org* that allows you to see what TV stations are available at a specific address and what size antenna is required to receive them.

I welcome your questions and comments. Send them to me at dlung@transmitter.com.



INSIDE BROADBAND — Will Workman

Updates on the Broadband Front

"Never f orget," an editor once told me, "a story never stops."

He was making a point journalists frequently forget: once you report a story it's never finished, consigned to history as a moment frozen in time.

As we dive into 2006 there are several major broadband stories that have evolved significantly since I wrote about them over the past two years. The following merit updates:

Wi-Fi

New York City has become the latest, and biggest, major metropolitan area on the Wi-Fi watch list. Officials there have set up a commission to hear public input on broadband technologies and advise Mayor Michael Bloomberg on how to address what they say is the city's mediocre progress in broadband adoption. A city-commissioned study last year found that only about 40 percent of the city's 8 million residents have broadband, despite ubiquitous availability, with most citing high cost as the primary reason for not subscribing.

Like Philadelphia and San Francisco, two other cities that have launched citywide Wi-Fi plans, New York City faces the sobering problem of digital divide. Unlike 14 other states, however, New York State has not succumbed to telco lobbying pressure and passed laws restricting publicly funded networks.

Bloomberg has always impressed me with his strong independent streak coupled with incredible business acumen. If there's a mayor in the United States who can choose a smart citywide Wi-Fi strategy, disproving claims by the telco lobby that public networks can't work, he's it.

WiMax

Wi-Fi's complement and competitor, WiMax, has also been on the move, literally. An industry group in December approved the new 802.16e standard, which proponents say could do for WiMax what 802.11 did for Wi-Fi: Clear a path for multiple vendors to offer interoperable products, accelerating deployment and lowering costs.

WiMax has touted its strengths of speed and distance, particularly over Wi-Fi and 3G wireless networks. Unlike Wi-Fi, which was built for indoor use, WiMax was designed for outdoor mobility, and would require fewer access points.

Intel, Motorola, and Sprint Nextel are some of the heavyweights testing or deploying the technology.

Despite progress on these technological hurdles, several major technology insiders say meshed Wi-Fi rollouts address its shortcomings, and that WiMax will eventually find its niche as a backhaul solution. 2006 will reveal much about whether WiMax optimists are too myopic.

BPL

Though still taking a back seat to the wireless broadband frenzy, broadband over power line has been quietly picking up adherents and moving into trial stages in several markets.

Beginning this year, the largest electric company in Texas, TXU Electric Delivery, and service provider Current Communications Group, plan to deploy BPL to about 2 million homes and businesses. Current says it will offer voice, video and data services. The Texas rollout is at the forefront of more than 50 other utility companies nationwide that are in planning or trial stages.

Depending on the source, the United States is already lagging behind at least 10 other countries in broadband deployment.

And if you may be tempted to dismiss BPL (as I have been guilty of over the past year), you might want to heed an old journalistic adage: follow the money. None other than Google has been pumping cash into BPL. This year may show whether BPL is a real broadband contender or an also-ran.

THE LAW

Technological advancements may be exciting to follow, but the most significant piece of the broadband puzzle, and perhaps the one that merits the most attention this year, is legislative. Wending their way in the House and Senate are bills designed to update the creaky 1996 Telecommunications Act, long overdue for reform—especially in areas critical to broadband.

The latest, the proposed Digital Age Communications Act, comes from South Carolina Republican Sen. Jim DeMint. Like others in the House, DeMint's bill strives to create one set of rules governing all broadband providers.

But the bill also takes a strong deregulatory stance and reins in the FCC, erecting two steep standards. The agency would be barred from issuing rules unless it can note "clear and convincing evidence" that the marketplace can't protect consumers, who will face "substantial injury" without government intervention.

Though this is an election year, which may put these bills on hold until the dust settles after November, the legislative process fusing these multiple bills into one will set the broadband agenda in the United States.

DON'T LOOK BACK

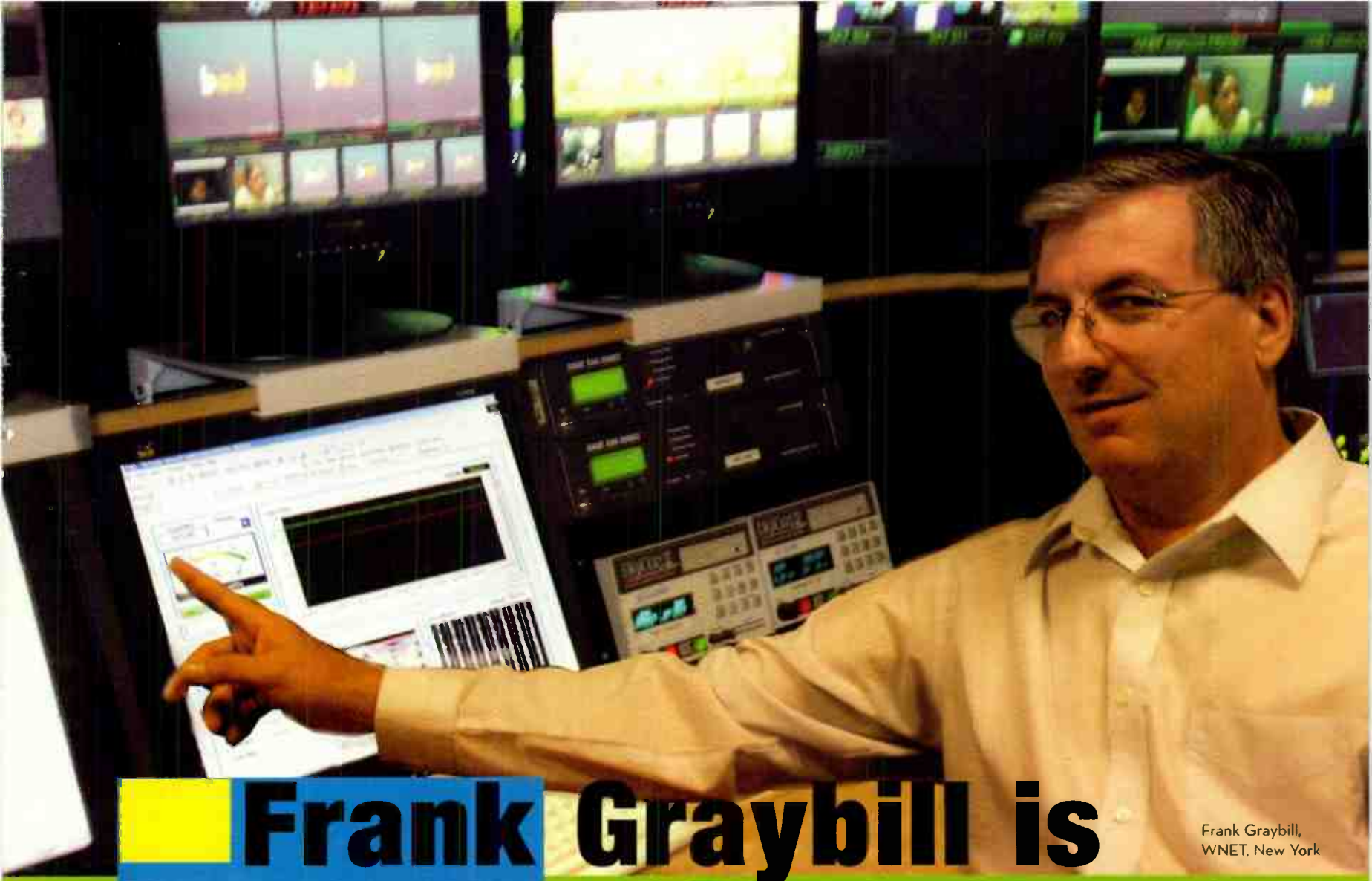
While various power interests compete and negotiate for broadband's future in this country, it's important to note that most espouse varying degrees of free market nonintervention. Don't shoot me for being a socialist, but there is significant and growing evidence from other countries that broadband development and deployment is not something that should be left strictly to market forces.

Depending on the source, the United States is already lagging behind at least 10 other countries in broadband adoption. These nations are treating broadband as an important communication segment of economic infrastructure equivalent to transportation. The point worth taking on all sides of our national broadband debate is this—is the progress these countries are making in broadband deployment translating into increased economic productivity? Is this occurring more rapidly than in the United States?

If the answer is yes, that companies of all sizes operating in these countries are seeing significant productivity benefits, not just from internal and external communication and coordination, but also from, say, an increasingly flexible and savvy workforce, then we need to consider reexamining some of our fixed tenets. To ignore the evidence could prove crippling.

I'll try not to forget that story.

Will Workman is editor of MediaView, a newsletter for the Asian cable industry. You can reach Will at wworkman@aol.com.



Frank Graybill,
WNET, New York

Frank Graybill is Choosey...

"We needed 8vsb Analyzers for both WNET DT New York and WLIW DT Plainview, NY. I made a list of parameters that we needed to analyze and priced equipment. I thought we'd have to spend $30,000 or more, then we discovered the 8vsb Analyzer from Modulation Sciences for under $10,000."

When WNET Needed 8vsb Analyzers, Frank Picked MSI

The **msi 4400** has many *standard* features the expensive boxes lack–like full remote control via the Internet, alarm and trend logging, automatic email generation and tap weight comparison over time, and most importantly, a commitment of support for the lifetime of the unit.

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The **msi 4400** delivers accurate real-time data from an antenna at our WNET studios in Manhattan, while at WLIW it takes its signal directly from the transmitter. Our engineers have full access and control of both units from their desks and through remote network connections.

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AUDIO BY DESIGN

Mary C. Gruszka

The Importance of Spec Design, Part 2

Last time we started to take a critical look at audio specifications by using as an example, a particular audio mixer with both digital and analog inputs and outputs. Most of the inputs and outputs on this console are analog, while only a few are digital, namely program outputs, aux sends and returns, and two-track inputs.

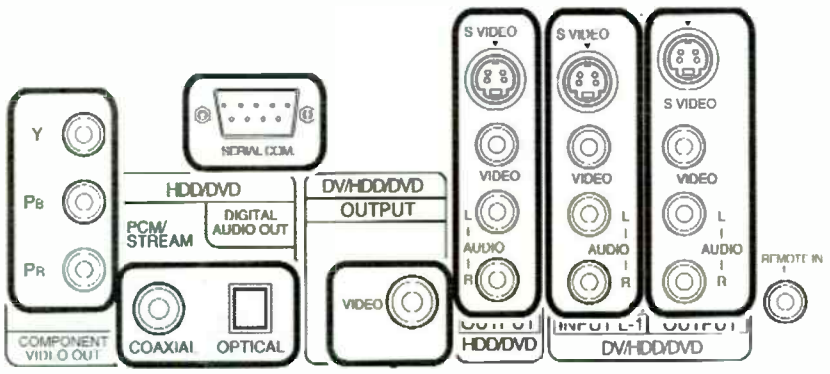
The goal of this exercise is to show how to examine specifications very carefully, even reading between the lines, to decipher what information manufacturers tell us, and also, quite revealing, what information they leave out.

Let's return to our audio console and look at a few more specs.

MORE THAN 1 dB

Monitor outputs are –10 dBs. Headphone output of the mixer is –26 dBs at reference level, but it doesn't specify what that reference level is. On the plus side, the spec does say that the stereo phone jack wants to "see" an 8 ohm load; that means no 600 ohm headsets.

But what is a dBs? I see that term in many specifications. From the way it is written, the 's' in dBs could be interpreted as an abbreviation for the reference level. But what reference? For dBV the 'V' means that 1volt is the reference. For dBm the 'm' means that 1 milliwatt is the reference. But 's'?



Typical DVD recorder connector backplane

My guess is that in this spec, dBs means nothing more than the plural of dB, as in one dB, two dBs. But that tells us nothing useful. A decibel simply represents a ratio of two parameters, voltage, current, power, sound pressure level, to name just a few.

If one voltage is 6 dB higher than another voltage, we would know that the first voltage was twice the second, but we wouldn't know what either voltage is. It could be 2 volts compared to 1 volt, or it could be 400 volts compared to 200 volts. Either way, the ratio is 2:1 or 6 dB.

Now back to our monitor output. Since we aren't given the reference level, all we know is that this output is 10 dB lower than something, but we don't know what, and we can't calculate the actual voltage output.

At this point let's try to add some gear with digital audio I/O to our system. Perhaps a DVD recorder.

I checked one particular company's Web site for pro gear (that company also makes consumer equipment), clicked on a link for broadcast/professional video, chose DVD recorders, and got a list of model numbers, again under the heading of broadcast and professional video.

I decided on a combination recorder that has DVD, mini-DV, and a hard disk recorder. The feature details say that this device has excellent digital audio and that a variety of audio formats can be recorded including MiniDV in PCM 48 kHz and linear PCM (no sampling frequency given for this mode). But what about connections?

For that I had to open a .pdf file and study a fuzzy picture of the rear connector panel to realize that there weren't any professional audio connections at all! It looked like the digital audio output was on an RCA connector (the very limited audio spec noted that the output was coax). Chances are that the output was S/PDIF, the digital audio format used more often for consumer products, not the professional AES/EBU. In addition, the listing of inputs and outputs didn't indicate a digital audio input.

There were two other sets of RCA connectors for audio in and out, but presumably, these were analog connections, although not specifically stated. With RCA connectors, these I/Os would be inherently unbalanced, which are not professional connections in my book.

While I don't feel that this device could be categorized as a broadcast or professional product, in any given project, such types of devices often need to be integrated into the system. How could we handle this DVD player?

I would first confirm with the manufacturer that the digital audio output was indeed a S/PDIF connector, and also try to get a clearer picture of the rear connector panel. If indeed the output is S/PDIF, then I would use a S/PDIF-to-AES converter, since our audio mixer has AES inputs. If I could find a converter that had a BNC AES output, so much the better, since our original requirement was to distribute AES via 75 ohm coax. However, in the more likely case that the converter had an AES XLR connector for the output, then we would need a 110 ohm to 75 ohm transformer. For the analog side of this DVD player, we could take two routes. One is to keep the signals in the analog domain and use unbalanced/balanced converters to go in and out of the analog side of the audio mixer. For this particular console with more analog I/O than digital, this would probably be the better approach.

TIMING IS AN ISSUE

But if we had a different digital audio console or wanted to feed a digital output from our example mixer to the analog input of the DVD player, we would need two converter boxes—one, a digital-to-analog converter, which, being a professional unit, would have balanced outputs, and then an analog balanced/unbalanced converter.

Timing is also an issue in digital audio systems design. All devices with digital audio I/O must be synchronized together, and for digital audio gear working in a video environment, everything should be locked to video

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Peripheral

CONTINUED FROM PAGE 28

SO WHAT, YOU SAY...

Alright, so they have to make the head stiffer to pan, what's so hard about that?

Try this experiment, my friend said. Take a tripod with no payload, crank the drag on the fluid head way down, and pan it. Do you like the way the feet slip across the floor? If you're not going to sandbag the legs down, he said, this new drag system is going to have to be carefully designed to supply just enough drag.

Tripod makers aren't the only ones facing these kinds of challenges. These new, smaller cameras are throwing a pair of curves at teleprompter makers.

Problem is, the lesser mass of the HDV camcorder can actually make it harder to achieve smooth moves, just like it's harder to steadily hand-hold a small camera than a bigger, heavier one.

The first is one of design. In the old days, all field video cameras were about the same size. Prompter makers tell me that back then, they could design a one-size-fits-all prompter.

Now, camera makers are bringing out camcorders in a number of sizes and shapes, each needing a different bracket. That reduces the economy of mass production, since engineering and manufacturing must keep adapting to these various sizes of camcorders.

What one prompter maker told me is that they had to go back to their basic design and work on a new platform that would be very flexible. Their goal was that no matter which camera they were adapting to, most of the prompter assembly would remain the same.

This raises the second quandary, which is how to correct a perception that the smaller the camcorder, the smaller the teleprompter.

"What people aren't realizing is that the prompter is for the talent, not for the camera," said one prompter maker. "The camera may have gotten smaller, but the talent's eyes didn't get better."

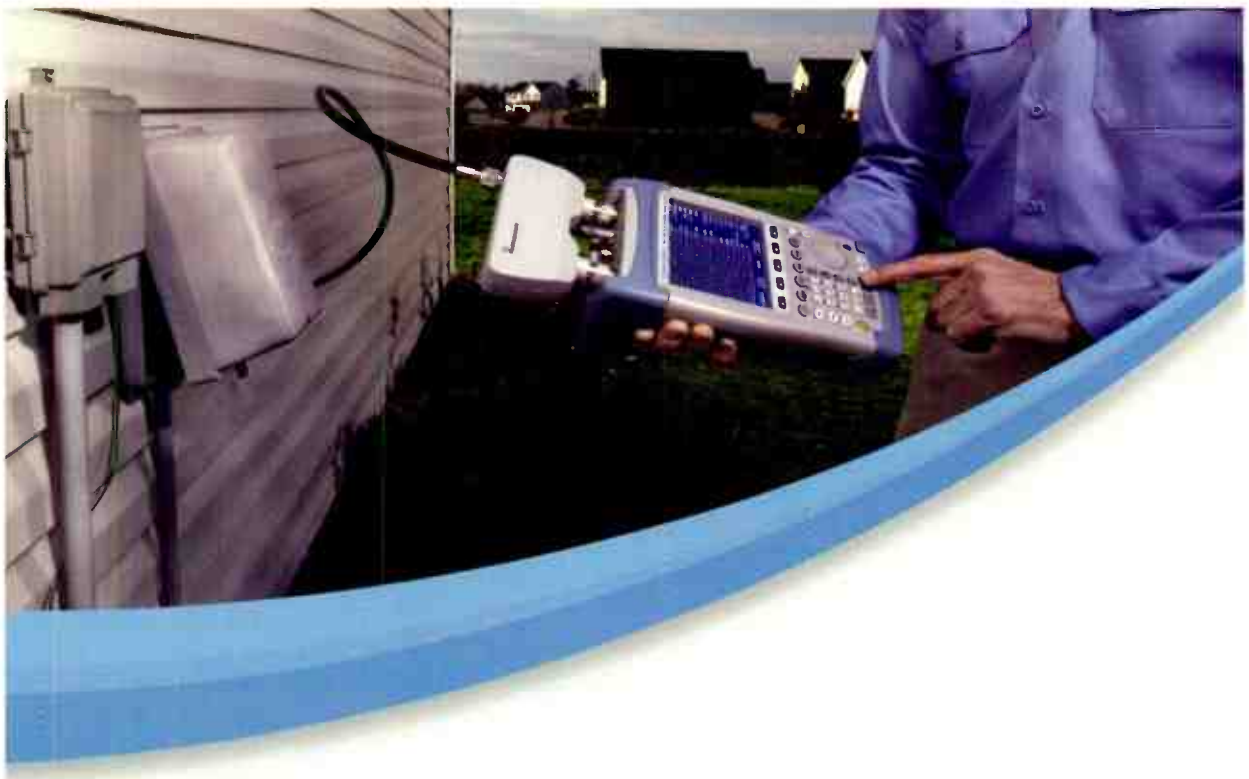
Finally, I've been talking to lens makers. In this case they were not talking about lenses for the smaller, less expensive HDV camcorders but for top-of-the-line HD-cinema cameras.

They're talking about the relative difficulty of a lens delivering a top-quality image to a 2/3-inch HD-sensor versus a 35mm frame of film. To get that end product on the screen, it's going to be more difficult for the HD cameras than for the 35mm film cameras, and more expensive.

They said it doesn't have to do with the difference between film and video; it has to do with the size of the image area. So it follows that the smaller the imager in a video camera, the harder and more expensive it will be to build a lens to achieve a comparable image.

So to repeat the message, just because some things get smaller doesn't mean everything's going to get smaller and just because some things get cheaper doesn't mean everything's going to get cheaper.

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

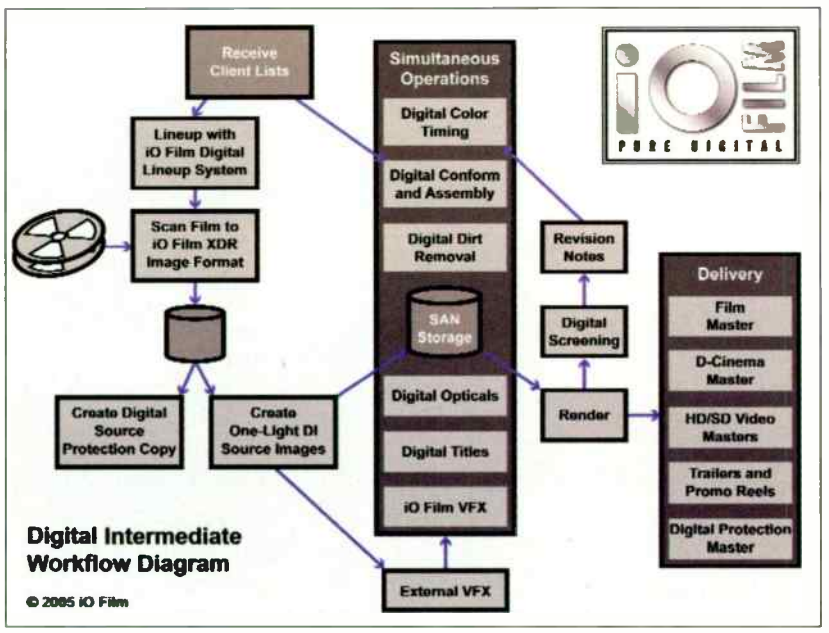


FOCUS ON EDITING

Jay Ankeney

DI Brings Creative Editing into Digital Mastering

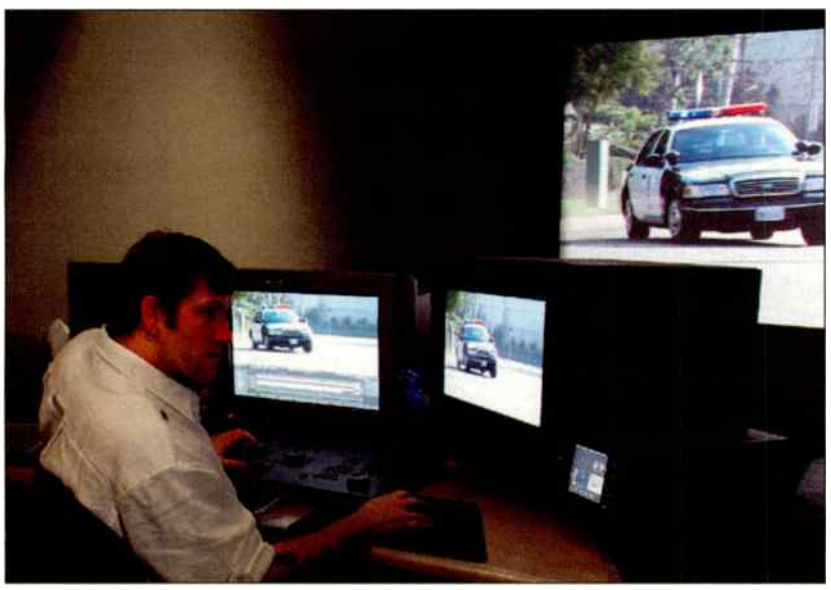
Since the dawn of digital editing, we keyboard cavaliers have come to expect that every year we will be presented with technology that is bigger, faster and better to help us craft our creative cutting. But recently, a quantum leap in 2K and 4K film scanning and storage capabilities has begun to shape our ultimate finishing procedures, called "digital intermediate," or DI. So we're going to start this new annum by looking at how the growing popularity of DI finishing may revise the role of the creative editor, or what we used to call the "offline" process, in creating the final product for either film, high definition or video release. After all, we've learned the technology available only in specialized labs today may well be on our desktop tomorrow.



DI Workflow

GATHERING PROCESS

Most editors first became aware of the DI process back in 2000 when the Coen brothers used it to craft a uniquely desaturated, tinted look for "O, Brother Where Art Thou?". Since then, however, DI's have come to be used for most major feature films and, increasingly, HD-originated productions.



iO Film Senior Colorist Adam Hawkey color timing a scene from the feature film "Crash."

Today there are many top post houses offering DI services, such as iO Film in North Hollywood where they have created digital intermediates for, among other releases, "Crash," "The Celestine Prophecy" and this year's "Neverwas." iO Film uses a Nucoda Film Master for editing and color correction that can also go to HDCAM SR tape and Arri Laser recorders to record out to film. Evan Edelist, executive vice presidnet and general manager at iO Film, explained the basic purpose of a DI is to corral all of the source material, whether film or HD, into one nonlinear digital workflow for final color correction and effects polishing. From there, you can either render everything into a data file from which an internegative can be recorded out or you can repurpose the project into a high-definition master from which any deliverable video or HD format can be transferred.

"When the creative film editor sees his or her feature projected in full resolution during the DI process, they can... make tweaks to edits or effects in real time right during the session, Edelist said. "Or, if the editor on a high definition [file] had been using a system such as an Avid Nitris that can handle HD files internally, he or she can master the DI themselves in online fashion. That way, the offline editor can be at the helm of the form in which the final HD master ultimately will be created."

Since the original source material will often be scanned from a film negative, iO Film has developed a proprietary software called iPerf that transfers the KeyKode numbers etched into the side of the negative from the most common editorial exchange formats such as ALE (Avid Log Exchange) files, FLEX files or Avid Bins, and film cut lists into their

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Spec

CONTINUED FROM PAGE 38

house reference (color black).

The specs for this DVD player don't indicate a word clock reference input, but maybe a better picture of the rear panel would show this connector. If there isn't one, and we still need to use this unit for its feature set, then the digital output or the output of the S/PDIF-to-AES converter may need to be run into a sample-rate converter that is locked to house reference. Otherwise, pops and clicks could result when feeding the output of this machine into the digital audio input of another device.

If any of the converters mentioned here aren't frame-mounted, make sure you have extra power outlets for all the wall warts.

As can be seen, the design starts to get more complicated when integrating devices with consumer connections into a professional system. Reading specifications closely and critically will give an indication as to how easy or difficult it will be, and what external conversion devices may be needed. If the specs don't give the answers, contact the manufacturers.

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****.*

Editing

CONTINUED FROM PAGE 40

own I/O database. This lets them track the origin of every frame of scanned film as DI intermediate pipeline.

"This capability means the editor can be assured they will be able to recreate any effect from offline into the DI," iO Film's president, Tim Krubsack said. "In the old days, that might have needed to be sent out for additional vfx work in a visual effects house which could cost time and money. Now, when using the DI process, that creative decision does not have to be delayed or, in the worst case, eliminated."

Another DI haven, Encore Hollywood, has used this concept to create an integrated approach to managing digital visual imagery throughout the production process. It's based around their new Digital Intermediate Theater which features a Kinoton FP30 ECII Studio Series electronic 35mm film projector, a Barco DP100 2K DLP digital projector, and a da Vinci 2K Plus color correction system. With this, Encore's new DI division is finishing up its first DI project, the Russian the supernatural vampire thriller "Day Watch."

As one of the Ascent Media companies which include famed colorist Stefan Sonnenfeld's Company 3, Encore has an almost limitless talent pool to draw from for DI assignments. One of them is DI finishing expert, senior editor Dan Aguilar, who uses either a Discreet Fire or DVS Clipster 2K system for online conforming in their Digital Intermediate Theater.

"As long as they have done their offline process correctly, and tracked their media properly, most of the time the DI process should be pretty transparent to the creative film editor," Aguilar admits. "But our recent experience finishing 'Day Watch' with director Timour Bekmambetov and editor Dmitry Kiselev, demonstrated how creative DI finishing can be. Due to scheduling, they had to start the DI process even before the picture was completely locked."

As a result, Kiselev was actually sitting in the theater recutting the film on his laptop while Aguilar was conforming the DI.

"They were incorporating effects created in 10 different countries in eastern Europe," Aguilar recalls. "The files were sent to us via ftp and depending on how the effects looked, Kiselev would modify the way the film was cut. It was all a very immediate experience for him and us."

TRAFFIC COP

For Aguilar, the biggest challenge in creating a DI is keeping track of all the changes.

"Since editors have greater accessibility to the finished product during DI creation," he said, "that gives them greater control over how the film will look on the screen. And it is my job to keep up with them."

However, Aguilar is aware that there is a major move in Hollywood to get away from shooting film entirely as digital cinema cameras capable of recording 2K resolutions and above become accepted for major feature film productions.

"Again, it is all about tracking information," he said "and as these new digital cameras are adopted, we will have to be able to cross reference shots with ever more elaborate metadata. For visual effects reasons, we will need to be able to encode lens sizes along with the picture files and even audio will be recorded with the imagery. The DPX [SMPTE Digital Picture Exchange] file format created by the newer 2K scanners has header space that can hold a tremendous amount of ancillary information which we will need to access. But all of that will just make future DI workflows more creative."

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.

PRODUCTS & SERVICES SHOWCASE

PRODUCTS & SERVICES SHOWCASE

CAMERAS

Sony HVR-A1U, HVR-Z1U HDV Cameras

by Geoff Poister

As the HDV format gains acceptance, many people are wondering what camera to buy. Sony, JVC and Canon offer competing models and formats, with the most significant difference being the choice between 720p and 1080i.

Sony has adopted the 1080i format, and now has enough models available to compete with itself. First there was the HDR-FX1, a high-end consumer HDV camera. Then Sony offered a professional version of that camera, the HVR-Z1U. Sony also makes a number of consumer-grade HDV palmcorders.

Now there is the HVR-A1U, which essentially lies between Sony's line of consumer and professional HDV cameras.

But this middle ground can be a bit confusing. Sony product literature describes it as a professional HDV camera, but indicates that the A1U should be viewed as an auxiliary camera, with a small size and weight for those hard to reach places.

So the questions are, is it good enough to be a primary HDV camera for the professional, and how does it compare with the HVR-Z1U?

The Sony HVR-Z1U HDV camcorder

FEATURES

The most obvious difference between the two cameras is in the chips. The Sony HVR-Z1U contains three 1/3-inch, one megapixel CCDs, while the HVR-A1U has a single three-megapixel CMOS imager. The CMOS imager boasts some new innovations, but in my tests does not reach the level of three-chip camera performance.

Camera size and weight are apparent, with the Z1U weighing 4 pounds, 10 ounces, and the A1U weighing 1 pound, 7 ounces. The Z1U is a heftier camera (slightly larger than the Sony PD-170), while the A1U can be held and operated with one hand.

Part of the weight difference is due to a larger and faster lens on the Z1U, which has a 12X optical zoom as opposed to a 10X zoom on the A1U.

The audio is handled similarly in both cameras. There are two channels with XLR inputs, 48 kHz sampling rates, phantom power and independent control of each input.

Both cameras record HDV 1080i using MEPG-2 compression. However the Z1U also records 50i PAL and 480 progressive in standard definition. Both cameras also record standard DV in the DV SP or DVCAM mode.

Both cameras offer "Cineframe," which simulates the 24 fps look. But buyers should be aware that it is not true 24 fps and is not a substitute for 24p cameras that can do direct frame-to-frame film transfers.

The more useful film-look feature offered on both cameras is Cinematone Gamma. It adjusts the gamma curve to match that of film. It is effective on both cameras in improving the color depth and range in black areas. While there are software solutions that achieve similar results, having everything uniform on capture can save many hours of tweaking and rendering in post.

Both cameras also allow you to output standard DV from an HDV recorded tape over IEEE-1394. This can be useful if you want to input the material into an NLE for an offline edit that can later be recaptured at HDV resolution.

The LCD screen on the two cameras is also visibly different, with the Z1U offering 250,000 pixels compared to 123,200 on the A1U. The resolution of HDV and standard DV is indistinguishable on the A1U LCD screen.

However, since the A1U is about half the cost of the Z1U, there are obviously going to be significant differences. It ultimately takes a test to see what the two cameras deliver.

IN USE

I set both cameras next to each other on tripods on a busy city street and rolled tape simultaneously. First I shot footage in the HDV 1080i mode, then HDV 1080i in Cinemotion 24, and finally standard DV. I then captured the material using Final Cut Pro and set it up for split screen playback.

I analyzed the HDV footage first. The image difference between the Z1U and A1U was immediately apparent. The Z1U provided a rather stunning image with excellent detail and very pleasing color rendition.

The A1U, on the other hand, had colors that were paler and detail that seemed artificially enhanced. The image also was highly subject to the "moiré effect," which results in distracting horizontal line interaction. The Z1U image

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FAST FACTS

Application
HDV capture, professional and prosumer levels

Key Features
HDV1080i, DV, DV SP or DVCAM recording; XLR audio inputs

Price
HVR-Z1U $5,946
HVR-A1U $3,100

Contact
Sony Electronics
201-930-1000
www.sony.com/professional

Sony

CONTINUED FROM PAGE 44

had more detail, but appeared to be smoother, while the A1U image was harsher and seemed to have difficulty with narrow lines.

The Cinemotion 24 on both cameras produces an artificially stuttered image that is not a faithful match for true 24 fps capture. It emulates a 3:2 pulldown through a complex process that juggles frames and fields while actually recording at 60i. Personally, I would only use it as an effect, as it is not an acceptable 24 fps look. If you want to shoot true 24 fps, use a different camera.

The difference between the two cameras was less noticeable when comparing standard DV footage. In fact, the material looked almost identical except for the slightly paler color on the A1U. For standard DV, the cameras produce footage that is almost indistinguishable and could easily be intercut.

But one would presumably buy either of these of cameras for the HDV capability. On that level, they are clearly not equivalent.

To put it in simple terms, the A1U has a one-chip look reminiscent of consumer and prosumer cameras. The Z1U is clearly a professional camera engineered for the discerning professional in the broadcast industry.

While the A1U has a one-chip prosumer image, it also has a prosumer layout. In fact, it is basically a prosumer HDV camera with an attachable XLR module. The ability to access controls for iris, shutter, gain and white balance are embedded in menus that tend to default to automatic settings. As a result, it takes considerable effort to put all of those elements in manual mode. The iris and gain are linked, so that increasing the iris beyond a certain point causes the gain to kick in, which can result in a noisy picture.

The Z1U is set up for greater control of iris, gain, shutter speed and white balance. It is designed for the videographer who knows how to use these features, while the A1U is essentially more automated. The A1U also uses a touch screen menu, while the Z1U has a menu controlled by a dial. The Z1U also has essential features, such as white balance, gain and shutter speed, controlled by mechanical buttons on the side of the camera, which are vital for quick access. A nice touch is a physical knob that controls the iris in manual mode, allowing easy and surer control. The Z1U can also run on full auto if desired.

I did one final test to compare efficiency in low light, thinking that this might be an advantage of the A1U and its CMOS imager.

The A1U is designed like other prosumer cameras in that it automatically boosts the gain to compensate for low light. It takes a bit of time to go through the menu and turn off all of the automatic functions, but it can be done. It is much faster and easier to put the Z1U into fully manual mode. Once the cameras were in manual mode, I could compare the images shot in a dimly lit room.

It turned out that the Z1U is actually more efficient in low light. I was able to achieve an acceptable, dark image with the lens at f1.6 and 0 dB gain and a shutter speed of 60. To achieve a comparable image, I had to boost the gain on the A1U to 6 dB, which introduced some noise in the image.

SUMMARY

The Sony HVR-Z1U and HVR-A1U are actually cameras in different classes and as such, it is not fair to compare them by equivalent criteria.

The HVR-A1U is half the cost of the HVR-Z1U and basically half the camera. I would call it a consumer HDV camera with XLR audio inputs.

The CMOS chip does not provide an image that rivals the three-chip Z1U. The consumer version of the HVR-Z1U is the three-chip HDR-FX1, and that camera provides a superior image to the one-chip HVR-A1U, although it lacks XLR audio. But if you are looking for a cheaper alternative to the HVR-Z1U, and image quality is the primary criterion,

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LENS ACCESSORY

Century 1.6X Tele-extender

by Carl Mrozek

The inability to change lenses is the Achilles Heel of Sony's groundbreaking HVR-Z1U HDV camcorder. This creates a creative wall for many pros, particularly when it becomes necessary to go deep, or to go wide. Fortunately, there is now a solution for both needs. Century Precision Optics, a division of Schneider Optics, based in Burbank, Calif. has developed both a telephoto and a wide-angle solution for Z1 users.

The telephoto solution is its 1.6X telephoto extender and for wide-angle situations there is a 0.7X zoom-through extender. The 1.6X transforms the Zeiss 4.5-54 mm. lens into a 43 x 86.4 lens, well suited for applications such as sports, live performances, weddings and wildlife. Remarkably, this is achieved with no significant loss of light. The tradeoff is a drastic reduction in the zoom range due to a big increase in the minimum focal length on the wide end of the zoom range. This is due to a "telescoping" effect wherein the "inside view" of the 1.6X intrudes on the visible image area halfway through the zoom. This is akin to what one sees when looking through a telescope "backwards."

DESCRIPTION

The Century 1.6X Tele-extender is a big hunk of finely polished glass encased in a seamless flat black chassis resembling an ultra-wide lens for an SLR film camera.

However, Century's 1.6X is definitely beefier than any SLR prime lens at just under 2.5 inches deep and with an outer element measuring a whopping 105 mm in diameter. The inner element, or base, which attaches to the outer element of the Zeiss lens measures 64 mm in diameter. The net result is an impressive piece of glass which weighs in at around 2 pounds overall.

To fasten the big 1.6X securely to the Z1 camcorder, Century designed a beefy, bayonet mount for securing it with a single strong twist of the wrist on the low-geared fastening ring. Century's female bayonet ring mates neatly with Sony's four-tooth male bayonet mount for the lens shade. To accommodate the tiny fourth tooth flanking one of the standard bayonet teeth, Century super-sized one of the slots on its bayonet ring to accommodate the fourth tooth on the Zeiss lens. The result is a stronger mount when locked down. The asymmetric opening also makes it easier to align the 1.6X with the outer element of the Zeiss lens for fast mounting.

To protect the large and finely polished 1.6X from scratching and precipitation, Century provides an optional sunshade. By design, the 16:9 sunshade fits snugly around the 105 mm outer element of the Tele-extender and can be locked firmly in place by hand-tightening a long, slotted fastening bolt tangent to fastening ring. The sunshade accommodates either a 4-by-4-inch plain glass filter or a complete line of Schneider filters. Alternatively, a full spectrum of gels can also be inserted into a simple filter tray that fits neatly into a slot between the lens shade and the fastening ring and is secured by a thumbscrew.

The Tele-extender, shown with optional sunshade, mounted on the Sony HDV camera

IN USE

I tested the 1.6X with a Sony HVR-Z1U camcorder. After removing the Z1's sunshade, I simply aligned the larger female bayonet receptacle on the 1.6X with the double bayonet teeth on the outer casing of the Zeiss lens, then gently twisted counter-clockwise and snugged up the fastening ring of 1.6X until it locked into place. There are alignment guides (yellow dots) on the fastening ring, and the extender. When "locked on," the yellow dots are about an inch and a half apart. To remove the extender, the fastening ring is rotated until the yellow dots meet. At that point the 1.6X is unlocked and easily removed from the Z1.

I used the Century 1.6X extensively while shooting a documentary about Pennsylvania elk and the people obsessed with them during the fall rut. Capturing the elk's famed "bugling," pursuit of cows and the competition among the bulls demanded that I be "invisible" to the elk. This meant keeping my distance from them so that they could ignore me and go about their business. Even though elk are as big as cows, this could only be achieved with at least a moderate telephoto lens or a standard zoom lens plus Tele-extender, as much of the shooting was done from at least half a football field away. Without the Century 1.6X, I could not have done the job with the Z1 and its standard lens.

As elk are most active early and late in the day, much of the shooting for this project was done in marginal lighting conditions, which made focusing critical. Luckily, the Z1 includes focus assist and auto focus, both of which helped me focus accurately, most of the time, even in low contrast and dim light. Overall, the bulk of footage shot with the Century 1.6X was well focused, thus enabling an accurate comparison of video shot with and without the Century 1.6X extender.

One of the first things I noticed with the Century 1.6X was its sharpness and high resolution. In everything I examined, it was extremely difficult, if not impossible, to distinguish footage shot with the Century 1.6X from footage shot without it, based on sharpness, contrast, color quality and color tone. In most cases, unless I knew for a fact that I had or hadn't used the 1.6X for a particular series of shots, I couldn't make such a determination from quick visual analysis of the video. Generally there was no noticeable loss of light with the 1.6X, except when fully zoomed in under dim lighting conditions. The workaround solution was to zoom out slightly to restore the (one-half to one *f* stop) lost light.

CENTURY, PAGE 47

FAST FACTS

Application

Increasing the versatility of the Sony HVR-Z1U HDV camera.

Key Features

Minimal light loss and ease of installation

Price

1.6X Tele-extender $999; sunshade $275

Contact

Century Precision Optics
800-228-1254
www.centuryoptics.com

Sony

CONTINUED FROM PAGE 45

buy the HDR-FX1.

The HVR-Z1U, however, is an excellent camera that is worthy of professional use. It is one of the best HDV cameras available.

When looking at the Sony line, ultimately one has to consider the price and application of the camera.

The HVR-Z1U is a first-class HDV camera for professional use. I would recommend it to anyone who is looking to acquire a top quality primary HDV camera.

But the HVR-A1U does offer an interesting option as a secondary camera. It is very small, lightweight and unobtrusive. It could be very useful as a B camera on difficult shoots, or when a camera needs to go unnoticed. It would be a great camera for one to carry while skydiving or skiing. In other words, hazardous sports photography and clandestine activity could be handled well with this camera while the HVR-Z1U covers the majority of the footage.

And I believe that is Sony's intent with the release of this camera as a "professional" model. Footage from the A1U can be mixed with that of a higher quality A camera and offer options to shoot in difficult or extreme conditions.

In fact this is a funny extension of the original logic of using HDV in broadcast. Many stations are using $80,000 full HD cameras for primary acquisition, and HDV cameras such as the HVR-Z1U as a "B" camera. Now Sony has introduced what is essentially a C camera—one that can fill in high definition footage under conditions that may require a highly mobile or possibly even a disposable camera.

Low cost options are always good, and Sony deserves praise for pushing the envelope of high definition into extremely cost efficient territory.

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Century

CONTINUED FROM PAGE 46

In normal daylight, the loss of light was barely noticeable when zoomed in, and there was also no visible degradation in sharpness or other reduction of video quality. When viewing the sample video on Astro's 8-inch DM-3008 HD monitor, I was impressed with the quality of the 1080i footage shot with the extender—even video of bulls bugling and sparring after sunset and before sunrise. In close-ups, I could still clearly discern individual hairs and beads of sweat in their mottled manes. The same was true of close-ups of elk shot in a heavy downpour. The level of detail was undiminished by the 1.6X, even in moderately dim light.

While part of the credit goes to Sony for designing an affordable yet extremely light-sensitive HDV camcorder, the Century 1.6X performed exactly as advertised. It extended the capabilities of the built-in Zeiss lens to reveal even greater detail without compromising quality. In example after example, video captured with the 1.6X was as crisp and well saturated as that shot without a Tele-extender. This included a full gamut of shots from medium-wide to close-ups.

The detail in fairly static, sunlit close-ups was especially impressive. Basically, I couldn't discern any consistent "1.6X look" characterizing the footage that I shot with the extender. This was a pretty good indicator that the 1.6X delivered the goods and without artifacts, except in the poorest light and tightest shots. As one might expect, there was a distinguishable mark in some 1.6X footage—a slightly shallower depth of field in low light.

The primary tradeoff when using the 1.6X was the difficulty in getting establishing shots with only a 2:1 zoom ratio. One workaround was to opportunistically grab establishing shots of broad openings in the forest and elevated vantage points. The other option was to slip the 1.6X on and off quickly. With practice, I was able to remove the 1.6X in seconds, often without replacing the original sunshade. To do this, I wore a padded bag to cradle the 1.6X while shooting with the Zeiss lens alone. With practice, I became adept at quickly remounting the 1.6X to resume my focus on elk activity.

One persistent, bothersome issue was the impact of the two-pound 1.6X extender on the tripod head center of gravity. This was compounded by using a tripod head without a sliding adaptor plate which otherwise would have enabled me to re-adjust the camera balance on the tripod head. Without that capability, the Z1 with the 1.6X was definitely front-heavy. Often, I was able to adjust the back tripod leg or legs and the head angle to compensate for the frontward tilt, especially when working on hillsides. I was lucky that at least my tripod had sturdy legs with claw feet and was able to withstand the odd angles of the tripod head terrain. This might not have been as feasible with some of the newer lightweight tripods without claw feet. With these tripods, an improperly balanced head would create a greater risk of tipping over.

Conversely, the extra heft of the 1.6X was an asset when handholding the Z1, for even though the Z1 has built-in motion stabilization, this only goes so far when handholding, especially at longer focal lengths. The two pounds of the 1.6X made a significant difference in the mass and heft of the Z1 camera package and minimized camera shakiness when shooting handheld, especially when zoomed in. This enabled me to get useable static shots and even pans and tilts (at least in the lower zoom range) of elk and people. The 1.6X definitely made the Z1 camera package feel more substantial and comfortable to handhold, more like a 1/2-inch professional camcorder than a 1/3-inch prosumer-style camcorder.

SUMMARY

Based on my experience, the Century 1.6X makes an invaluable addition to Sony's HVR-Z1U (or the HDR-FX1 prosumer camera package) especially for applications where there are discreet limits on how closely you can approach the subject. This applies to everything from live performances and other events to sports and wildlife. Many news stories and, of course, surveillance could benefit greatly from the extra reach provided by the Century 1.6X. In general, degradation in video quality is negligible and primarily occurs in low light situations when the camera lens is zoomed in to the max. The small amount of degradation diminishes as you pull back.

As changing lenses is not an option with Sony's otherwise versatile HVR-Z1U HDV camcorder, the 1.6X provides an invaluable tool for professionals in extending the range of viable applications for the Z1 by adding greater "reach" and hence more detail when it is needed. This can be done far more quickly and cheaply than switching lenses, if that was an option.

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

MICROPHONE

Schoeps Shotgun Mic

by Ty Ford

For the last 20 years, audio pros have been asking why Schoeps, makers of arguably the most frequently used hypercardioid microphone for boomed dialog—the CMC 641—chose not to produce an equivalently excellent shotgun mic. The CMC 641 hypercardioid, as a boom mic, has distinguished itself as being able to reproduce what something actually sounds like, rather than what a microphone makes it sound like. In addition, its off-axis phase linearity results in a very cohesive sound. Sources outside the primary pattern don't sound phase smeared, just not as loud.

It was somewhat of a surprise, then, to find Schoeps debuting its first shotgun mic, the CMIT 5U at last year's AES show in New York. Given the design differences, can a microphone with an interference tube possibly achieve the same quality of sound of a well-designed hypercardioid? How does it compare to other shotguns? How well does it match the sound of the CMC 641? Read on!

Matching the sound of different mics is important because, within the same scene, camera angles and shot preferences may dictate that different mics be used; sometimes a shotgun, sometimes a hypercardioid, sometimes a lav or plant mic. Having them all sound the same is very desirable so that the sound of the dialog remains consistent. The sound person makes the call as to what lavs, hypercardioids or shotguns sound similar enough to be used. Those decisions, and a helping hand with EQ during postproduction, aim to make the transitions from mic to mic seamless.

The new Schoeps CMIT-5U shotgun mic

FEATURES

The CMIT 5U employs a supercardioid pattern. Sensitivity is rated at 17 mV/Pa. Self noise is 13 dB-A. Maximum SPL is 132 dB. Maximum output voltage is 1.31 V. Output impedance is 51 Ohms. The CMIT requires 48 VDC, 4.4 mA phantom power. For those unfamiliar with Schoeps nomenclature, the "5" in the model number indicates a power supply that requires 48 VDC phantom power. For those familiar with the 5, the new CMIT power supply is not the same as the 5 power supply used with other Schoeps capsules. This new 5 has been updated using more modern SMT (surface mount technology). The output stage, however, is conventional and handpicked for each microphone.

The longer the boom, the more significant the weight of any microphone becomes. The Schoeps CMIT 5U weighs 3.8 ounces. That's as light as the Audio Technica 4073a and Rode STG-1, and almost two ounces less than a Sennheiser 416.

Onboard features include three separate EQ switches: high-frequency boost (+ 5 dB at 10 kHz) to enhance speech intelligibility and compensate for high-frequency loss caused by windscreens; an 18 dB/octave high pass filter with an 80 Hz corner frequency for wind and boom noise suppression and a 6 dB/octave high pass filter with a 300 Hz corner frequency to compensate for proximity effect. The filters may be used independently or together. Small red and green LEDs indicate the status of each filter, allowing the user to determine settings in low light levels.

IN USE

I had the opportunity to compare the CMIT with three other shotgun mics. The Audio Technica 4073a was the most sensitive of all those tested, followed by the 416, the CMIT and the NTG-1. The CMIT is more than 11 dB below the 4073a, about 4.5 dB down from the 416 and more than a dB more sensitive than the Rode NTG-1. One of the long standing trade-offs of interference tube shotgun mics is reach versus off-axis phase and frequency response.

In comparing the CMIT with the Sennheiser 416, Audio Technica 4073a and Rode NTG-1, these three all exhibited some degree of frequency response beaming and irregular phase response as the source moved off-axis. While there was a very slight reduction in high frequency pickup as the sound source moved off-axis, I was not able to detect any obvious beaming or phase smear with the CMIT 5U. Apparently, Schoeps has been able to carry over one of the most important features of its CMC 641 to the CMIT and, in doing so, has eliminated one of the downsides of interference tube microphones.

On axis, the CMIT and 416 Sennheiser sound very different, owing mostly to the more aggressive HF peak of the 416. The CMIT more closely resembles the response of a Sanken CS-3e—a less processed top, less pronounced bottom and a more natural sound.

While setting the mics up outside for a real world comparison, I first had them positioned horizontally as I attached them to a stand. Both the CMIT and 416 were connected to a Sound Devices 442 mixer with the 442's EQ turned off. While listening to distant afternoon traffic (wideband noise) I realized that the CMIT was picking up more midrange automotive noise than the 416. However, the 416 was more sensitive to the higher frequencies. When I finished securing the mics to the stand and oriented them so they pointed downwards, the traffic noise immediately decreased. The 416 was still picking up some distant HF traffic sound.

SUMMARY

The CMIT exhibited a smoother, flatter response that was very similar to that of the Schoeps CMC 641. The 80 Hz filter on the CMIT reduced the LF sound of distant traffic both with and without the 442 mixer 80 Hz filter engaged. The more aggressive 416 caught the HF sound of footfalls on grass better than the others.

The Rode NTG-1 exhibited more peaks in its response than the CMIT and had a slightly higher noise floor, but did not display the peaked responses of the 416. With the 80 Hz low cut filter on the CMIT and the low cut filter on the NTG-1 both engaged, cars passing by and crickets were more apparent with the Rode.

As previously described, the Audio Technica 4073a was the most sensitive mic of the batch, but exhibited a more peaked response than the CMIT. However, the CMIT possesses a much richer midrange. The pattern of the CMIT drops off more gradually than the 4073a. Several airplanes flew overhead while I was comparing the 4073a and CMIT; at the time, the high pass filter on the 4073a and the 80 Hz filter on the CMIT were engaged. The 4073a rejected more upper bass/lower mid frequencies than the CMIT. With both high pass filters engaged on the CMIT and the high pass filter engaged on the 4073a, the CMIT had a richer midrange and slightly greater noise floor. Even in my "quiet" suburban yard, I had to listen carefully to hear the difference in noise floor. On a sound stage, I'm sure the noise floor level would be more apparent.

Back in the studio and using GML preamps and a Pro Tools system, I noticed something unexpected with the CMIT. Engaging the 80 Hz filter actually seemed to increase the LF in my voice. I heard this with Sony MDR 7506 headphones. I thought it might have been due to bone conduction, as I was listening to my own voice over the CMIT. I asked my next client to talk a bit and also heard the low frequency increase in their voice. Given the EQ curve, it doesn't make much sense, but that's what I observed.

The best news is that the CMIT and the CMC 641 are sonically matched, except for the usual differences due to proximity. You can use the upper high pass filter on the CMIT to roll off some of the LF to obtain a better match. My only real complaint is with the plastic threads used on the SG 20 swivel joint. I found that, while they are strong enough to resist stripping, they can be over-tightened all too easily. At that point they then pop off. When this happens, you have to disconnect the cable or take the mic out of the clip and screw it on again.

It appears that Schoeps has reinvented the interference tube shotgun mic. If you already use a Schoeps CMC 641, matching the sound will be quite easy. Dare we wait another 20 years for Schoeps to offer a matching lav?

Ty Ford is an independent audio/video producer based in Baltimore. He has been involved in audio/video technology for more than 30 years. He may be contacted at www.tyford.com.

FAST FACTS

Application

Professional location audio pickup and recording

Key Features

Small and lightweight shotgun mic

Price

$1,795 with case, swivel joint and windscreen

Contact

Redding Audio Inc.
203-270-1808
www.schoeps.de/home.html

VIDEO PROCESSING

Inlet Technologies Fathom HD Encoder

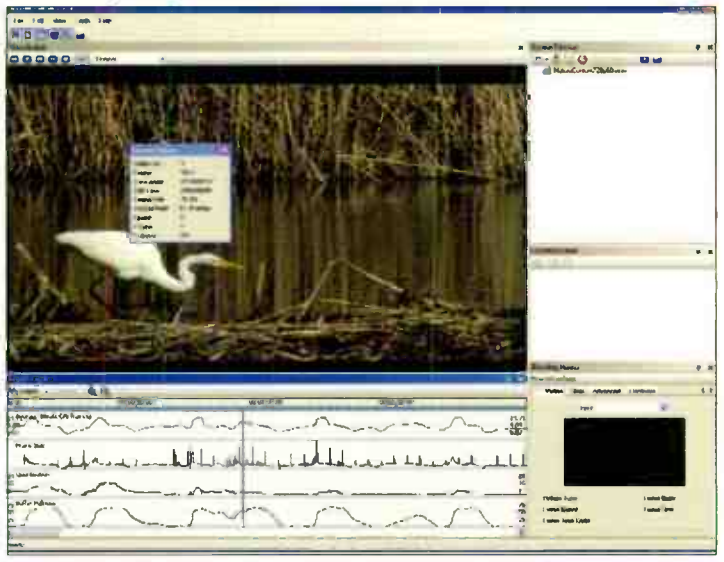
by Geoff Poister

In the brave new world of HDTV, video compression is likely to become the most crucial technology for everything from editing to archiving, and all forms of distribution.

And the distribution of media is becoming exceedingly demanding as we look at massive high-definition files that must be burned to DVDs, sent over satellite and phone lines and beamed to cell phones and iPods.

"The role of the 'compressionist' is becoming like that of color timers in film," said John Bishop, senior vice president of business development and strategy for Inlet Technologies. "Because virtually everything must be compressed in some way, understanding the nuances and preserving the director's visual intent has elevated compression to an art form," he said.

That was the goal of Inlet Technologies when they created a set of advanced compression tools geared for HD applications.



The Inlet Technologies Fathom user display screen

The core product is called Fathom. Because the demands for fast processing of high definition are so high, Fathom is based on a hardware card with maximum processing power. Then the company designed a simple user interface to make the compression job as easy as possible. Inlet also offers Semaphore, a sophisticated software application that hones in on particularly difficult areas for compression and provides tools to tweak them to perfection.

FEATURES

Fathom comes in several models to fit the application and budget of the user. The basic Fathom card processes large HD files at rates faster than real time. (It can also compress SD files with ease.) The next level, Fathom Live, has SDI inputs and can compress full-frame HD, live in real time. Fathom Pro includes the Semaphore software. Finally, one can purchase the entire system setup on an HP workstation, fully configured and ready to go.

For this review, I examined the Fathom Pro Encoding Station, which includes the full feature set on a Hewlett Packard xw9300 with an AMD Opteron 2.8 GHz processor. This is a powerful computer with 2 GB of memory and a 1.6 TB RAID for storing and handling large HD files.

Fathom runs on Windows XP SP2. Although it is not available on the Mac platform, files can be easily exchanged between the two.

Fathom is a compression system that leverages the power of the VC-1 encoding platform, an open-standard format based on Windows Media 9.

Software compression solutions tend to be slow and inefficient, so Inlet created the Fathom hardware card to handle the bulk of the processing burden. The Fathom card has six digital signal processors, which provide 8 GHz of processing power. This is what enables it to encode live HD signals over SDI, and to process HD video files at up twice the speed of real-time. File-based jobs can be done in half the time, which obviously is a significant workflow accelerator.

Fathom Pro includes an SDI input that accepts 1920 x 1080p at frame rates of 23.976, 24, 25 or 30; or 1280 x 720p at all frame rates. It also accepts SD 720 x 480. The card also processes virtually all types of AVI or QuickTime files at full HD or SD resolutions, progressive or interlaced.

Video pre-processing options include de-interlacing, scaling, cropping, 10- to 8-bit dithering, color-space correction and high frequency noise reduction.

The output is in the VC-1 format using constant bit-rate or variable bit-rate in one or two passes. The first pass analyzes the complexity of the signal to maximize compression efficiency on the second pass.

Because programs often come on several tapes, the software allows you to input time codes so that segments can be merged into one file. Conversely, one can create separate files from a single source tape.

The purpose of Fathom is to take high-definition material from any source—live, tape or file-based—and reduce the output file size to fit any need. One can scale the compression from mild to extreme to create outputs destined for applications ranging from DVDs to cell phones. It has recently become a popular device for creating HD dailies in the film and television production industry.

A significant feature is the ability to place the output file on a timeline, examine a graph of bit-rate and other compression data and re-compress problem areas. The re-compressed segments are merged with the original file, eliminating the need to re-render an entire project because certain areas were not up to snuff.

IN USE

The interface is simple and intuitive. It shares some similarities to existing software compression solutions, such as CleanerXL. To execute a compression job, you simply load a file into the session window and then drag it into the Encoding Que. Or you can select SDI input if using material that is live or from tape.

I tested the system using uncompressed AVI HD source files. I started with a 15 second clip of 1920 x 1080 uncompressed video stored in a 1.4 GB file.

After simply dragging the file into the Encoding Que window, a box popped up with a set of parameters to control. I set the compression rather aggressively, with a target of 8,000 kbps at a constant bit-rate. There is a quality regulator, which I set quite high. Setting the quality high results in a low quantization number. Keeping the quantization number low is the compressionist's persistent objective because it is an indicator of final visual integrity.

I then activated the compression process and watched the monitor window. File compression occurred in real time in this case, taking about 15 seconds.

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FAST FACTS

Application

Professional production or post-production work

Key Features

Accepts SD or HD video in a variety of formats and includes de-interlacing, scaling, cropping, 10- to 8-bit dithering, color-space correction and high frequency noise reduction.

Price

Fathom: $19,999; Fathom Live: $27,999; Fathom Pro: $34,999

Fathom Pro Turnkey Workstation: $42,000

Contact

Inlet Technologies
919-856-1080
www.inlethd.com

CHROMA-KEY

Reflecmedia Chroma-key Tool

by Ty Ford

In this era of smaller footprint facilities where there's also never enough time, Reflecmedia offers tools for effective chroma-key work that cost less than traditional solutions and work in smaller, more difficult lighting environments.

FEATURES

Although scalable in cost and complexity, a street price of $2,245 provides an entry-level system, that consists of a blue or green LED light ring with adapters that mount on the camera lens, a small handheld controller to adjust the intensity of the LED, power supply, seven-foot-square pop-up screen coated on one side with Reflecmedia's special reflective coating and a sturdy KATA carrying case for the whole kit.

The micro-beaded surface used on the Chromaflex pop-up and Chromatte fabric is made up of extremely small glass beads. The surface contains 70,000 of these tiny beads per square inch. They are half-coated with aluminum for additional reflectivity. This retro-reflective process is what makes the system work. When blue or green light from the lens-mounted light ring hits the fabric, it is returned along the same optical path and into the camera lens. The amount of reflected light is sufficient to be keyed out in studio or normal home or office lighting conditions.

With the entry-level kit, it is presumed that you would be using the keying features from video editing and compositing software, including Serious Magic Ultra, Final Cut Pro (or Express), Adobe Premiere or After Effects. Reflecmedia also offers Mattenee keying software developed by The Pixel Farm that works as a plug-in with several popular programs.

Mattenee software is tweaked to get results more quickly by recognizing the narrow width of color returned by the reflective surface and generating an immediate key that is 90 percent of the finished result. From that point, you can alter the contrast of the matte, detect and clean any noise and adjust the automatic color settings. Although the automatic setting was very fast, rendering a 41-second clip took 10 minutes on a dual 2 GHz G5 Mac. Results were great, even on whispy-haried closeups with mini-DV shot footage.

If time is more important than money, you'll probably want the Ultimatte DV real-time hardware box that provides control of foreground, background, freeze frame, gray test and matte. The Ultimatte DV I/Os are set up for S-Video (Y/C) and composite camera inputs, along with DV (IEEE-1394 FireWire) for either input of backgrounds or output of the composited image.

IN USE

We put the system through tests on the set at Voxcam/R&R Lighting in Silver Spring, Md., using a Sony DXC-D35 camera and a Panasonic CTS-1390Y monitor. I also rolled tape on a mini-DV Canon XL2. I had been warned that chroma-key and mini-DV don't work well together, but I figured we'd find out how bad it really was. I was joined by local independent film producer, compositer and graphic artist Craig Herron from Herron Designs. We started on Voxcam's stage with three-point lighting consisting of an Arri 150 for backlight, an Arri 300 for keylight and a soft box.

The Reflecmedia LED light ring and special reflective screen allow chroma keys to be done under challenging lighting conditions.

The overhead fluorescent lighting was still on when we fired up the Sony DXC-D35 and began feeding backgrounds from a DVD to the Ultimatte DV box via S-Video. The first thing we noticed was that even though the reflective material is silvery-gray, the camera equipped with the light ring saw it as blue or green, depending on the color of light ring used. The blue LED ring emanates a very pure blue light and completely encircles the camera lens. In less than a minute of manipulating the Ultimatte DV box, we had an effective key. Turning the overhead fluorescent lights on and off made very little difference in the quality of the key.

Traditional chroma-key usually requires a carefully lit back wall with talent placed far enough in front so as not to cast a shadow. With the Reflecmedia system, we were able to stand from mere inches to several feet in front of the Chromatte pop-up without the shadow causing problems. Impressive. Holding a length of Chromaflex fabric out in front, one of our subjects angled it away from the camera so we could see where the reflectivity dropped off. The fabric still kicked light on either side until it was close to being 90 degrees off-axis.

Herron makes small budget indie films in which he often does chroma-key and compositing. This frequently requires that the talent be shot head to foot. Even though we could see an obvious difference in the color of blue or green coming back from the screen as the material angled from the back wall to the floor, the chrominance level of the reflected light was strong enough so that the Ultimatte DV box was capable of handling the difference and making a nearly seamless effect.

We then switched to the Canon XL2 camera. With the Ultimatte box, we got better than expected results. Although the edges were not perfect, they were very good. We noticed a few shadows on our subject's body caused by our less than perfect lighting. I went hand-held and shot some low angles of shoes and feet to try and push the envelope, but the key held. I would be a little hesitant about using Chromaflex on a dance hall floor, but its surface looked sturdy enough for everyday use.

After the shoot, Herron and I reconvened at his studios and loaded some of the 30p, 16:9 video shot with the Canon XL2 into Final Cut Express. We then set about to see what could be achieved with Adobe AfterEffects 6.5 running on a dual 2 GHz G5 Mac. The DV Matte Pro 1.5 plug-in was most effective, with the results shot on green screen better than with the blue. Herron had recently worked with traditional chroma-key at a Baltimore sound stage. He remarked that Chromatte and Chromaflex were better than the "back room" efforts he'd tried, but not as good as at the sound stage. He mentioned that it took about two hours to light and stage that shoot.

A very large stage had been required, with the talent standing on the floor for head to toe shots. That had necessitated painting the floor for keying. While the stage had been large enough for properly lighting the chroma-key background, with so much green, there had been some green spill on the talent. Herron had used a white card to block some of those reflections. His opinion was that Chromatte and Chromaflex worked as well as any traditional big screen chroma-key he'd used while shooting mini-DV.

FAST FACTS

Application
Chroma-key work in small spaces with limited control of lighting

Key Features
Special LED light rings and highly reflective screen

Price
Entry level kit $2,245; Mattenee keying software $395

Contact
Reflecmedia
Bogen Imaging, U.S. distributor
201-818-9500
www.reflecmedia.com

We did notice some blue LED reflections in eyeglasses, but Herron was able to reduce them with masking. This could be a problem if you're shooting a full face close-up with someone who wears glasses that don't have a non-reflective coating. Depending on the situation, you can also minimize reflections reducing the intensity of the LED light with the controller and/or increasing the distance between the camera and the subject.

According to Reflecmedia, the ideal distance from camera to the reflective surface is 13 feet, with the subject 10 feet from the camera. What surprised me was that the effect worked even when the talent carried the Chromaflex fabric out of the sound stage and into the hallway lit with overhead fluorescents. At a distance of 50 feet, and under extremely undesirable lighting conditions, we still had a working key.

SUMMARY

Every technology has its limits. Reflecmedia acknowledges that Chromatte and Chromaflex work best on component and SDI systems, followed by Y/C, DV FireWire and composite video. DV via FireWire may result in artifacts and aliasing, which can be problematic when trying to smooth the edges of your key.

Over-the-lens prompters offer another challenge. They don't play well with the LED light rings. QTV, Listec and possibly others do offer prompter heads that sit above the lens. Of course that means the camera to subject distance must be about 10 feet to give the appearance of a good eye line.

Ty Ford is an independent audio/video producer based in Baltimore. He has been involved in audio/video technology for more than 30 years. He may be contacted at www.tyford.com.

IN-DEPTH WITH HDV

What is HDV?

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.

B&H: Your HDV Source

B&H offers every solution for your HDV video production: Cameras, Decks and Editing Systems. Our knowledgeable sales staff is on hand to help you make the best possible choice. For **Broadcast, Corporate, Event Videography** and **Digital Filmmaking**, B&H has the products needed to take you through editing, mastering and delivery.

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Graphics Desk

The ergonomic dual cabinet graphics desk from Winsted has an LCD mount and works well for edit suites where numerous LCD displays need to be viewed simultaneously.

The 72-inch wide work surface is roomy enough for tablets and keyboards and the built-in LCD mount can hold up to eight displays.

Dual rack cabinets offer 14RU of space for VCRs, rack-mount electronics, CPUs or file drawers.

To complement today's sleek-looking electronics, Winsted graphics desks are finished in a black granite laminate and contour trims come in a variety of accent colors.

For more information, contact Winsted at 800-447-2257 or visit *www.winsted.com*.

Graphics Plug-in

The Leitch Inscriber TitleMotion Pro HD is an HD graphics plug-in for Inscriber TitleMotion, offering 3D text/effects and workflow advantages.

Inscriber TitleMotion Pro HD enhances design capability and improves efficiency by providing offline creation that exports into editing studio applications.

The plug-in offers 3D text, effects and multi-layered composting. TitleMotion Pro HD allows for animated textures and animated kerning over time, and enables users to apply 3D effects to text and graphic objects over time.

For more information, contact Leitch—now part of the Broadcast Communications Division of Harris—at 416-445-9640 or visit *www.leitch.com*.

Adapter Kit

The EI2205-KIT adapter kit from Electronika International Inc. is designed to help resolve telecommunications industry equipment interconnection and interfacing problems.

The kit consists of 40 pieces and includes reverse polarity and standard adapters for BNC, TNC, SMA, N, MMCX, UHF, RCA and other industry connectors.

The gold-plated adapters are constructed of brass and stainless steel. Electronika also offers other adapter kits with connectors for use with frequencies extending to 40 GHz.

For more information, contact Electronika International Inc. at 440-743-7034 or visit *www.electronika.com*.

NAS Product

DiMeda 10G from Ciprico Inc. is the newest member of the company's DiMeda NAS product line. It allows multiple users to share both compressed and uncompressed high definition content over 10GB Ethernet.

DiMeda provides users with a plug-and-play, high performance alternative to SAN-based systems, extending those capabilities into areas using compressed HD formats, including HDV in broadcasting and JPEG 2000 in the digital cinema industry.

The DiMeda line was introduced in 2002 and has been utilized for content creation and delivery applications including newsroom production and automation, play to air and also in cable network delivery, including VOD.

For more information, contact Ciprico Inc. at 800-727-4669 or visit *www.ciprico.com*.

Video Analyzer

The VP21P video quality evaluation system by K-Will Corp. was designed to analyze the 720p HD format on an automated and real-time basis.

The analyzer uses a double-stimulus video quality evaluation system that performs pixel-by-pixel measurement and comparison of a reference and copy videos.

Functions include debugging encoder/decoder operations, quality evaluation of broadcast systems, automatic dubbing, DVD authoring and DVD playback.

For more information, contact K-Will at 949-553-9701 or visit *www.kwillcorporation.com*.

Send new product press releases along with color photographs to:
Marketplace Editor, P.O. Box 1214,
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Inlet

CONTINUED FROM PAGE 49

Once finished, the clip appeared on a timeline with graphic lines describing the average bit-rate, frame size, quantization and buffer fullness. By scrutinizing these graphic lines, one can see which areas are most processor intensive, and which areas may benefit from re-encoding.

At this point, though, I just wanted to do two things. First, check the size of the encoded file, and second, watch the encoded video.

The encoded file was a mere 15 MB. I was skeptical of the notion of taking a 1.4 GB file and squeezing it down to a measly 15 MB, and I was sure it would be a poor excuse for anything called high definition.

But when I watched the file on the Windows Media Player, I was astounded. Here was full frame, high-definition video of admirable quality, playing back from a file that is about one percent of its original size. Now of course, it's not an exact copy, and under close examination, one can see artifacts. But it compares amazingly well with the original.

I performed the same test on some other large HD files and continued to be awestruck by the quality. Fathom employs extremely intelligent compression, concentrating its encoding power on motion elements that attract the human eye, and stealing from areas that tend to be ignored or are static. The result is an image that is faithful to the original at data rate reductions that seem mathematically impossible.

Finally I decided to push the system to the point where I could get an unacceptable image, and I had to go very far. At a constant bit-rate of 4,000 kbps, I finally achieved a result where I could notice apparent blockiness in the image. But surprisingly, it only occurred when there was motion, and the more static shots looked quite good. But after all, I had reduced the file size from 38 GB to 179 MB. That's seven minutes of full-frame, 1920 x 1080 HD video and audio that you can put on a USB drive the size of a car key. In fact, at that rate you could put an hour of full resolution HD video on a common USB drive.

In addition to the startling quality of the compression, Fathom is delightfully fast and easy to use. Without even reading the manual, I was experimenting with all kinds of compression and analyzing the results.

The system is designed to allow quick improvement of problem areas by employing unused buffer space. By looking at the timeline, you can spot problem areas because, quite simply, all of the graphic data lines go up. Fathom allows you to highlight those problem areas, re-encode them, and merge the new encoded portion into the original file.

The brilliance of Fathom (and the genius of its designers) is that it achieves professional results of the highest standard with an interface that any consumer could understand and use. This is a product that can be implemented with an extremely short learning curve.

SUMMARY

Fathom is quite simply an engineering marvel that turns the process of compressing high definition video from any source into an enjoyable experience that yields startling results. It takes those frighteningly large data rates and files and tames them into small, easy to manage forms without sacrificing the beauty and integrity of the original image.

Furthermore, you don't need a three-week training seminar or instructional DVDs to use it. If you have even the most basic level of proficiency on an NLE, you can be compressing with Fathom in an hour. In fact, I found it easier to use than most consumer DVD creation software.

But, as the price tag indicates, this is a product for the professional production or post-production facility. It has wide applications, from studios that need high quality HD video dailies that can be sent over the Internet, to post-production houses that need to repurpose HD content for distribution via DVD, satellite, DSL, dial-up modem, video-on-demand and cell phones. To meet all of these distribution requirements, Fathom allows you to select the data rate and file size that fits the pipeline, while retaining the integrity of the original HD image.

Considering the speed, efficiency, reliability and incredibly high quality of Fathom's encoding process, it is well worth the price.

Geoff Poister, Ph.D. is a member of the Film and Television faculty at Boston University and a regular contributor to ***TV Technology****. He may be contacted at* poister@bu.edu.

TV TECH BUSINESS

Thomson Launches New Business Group Targeting Telcos

PARIS

Thomson has created a new division to address the needs of broadband service providers.

The company announced Dec. 29 the formation of the Thomson-Inverted Advanced Development Group, which will be headed by Eric Carreel, the co-founder of Inventel.

According to Bruno Fabre, Thomson vice president of Telcoms, "The formation of the Thomson-Inverted Advanced Product Development Group will reinforce Thomson's reputation as a leader in innovative technologies and creative product development and significantly enhance our ability to serve our network operator and ISP client base."

The focus of the new group will be to develop broadband service delivery products intended for commercialization by the Telcom and Home Networking Business units of the company.

Raycom Media Plans Sale of WWAY

MONTGOMERY, ALA. & SAVANNAH, GA.

Raycom Media, Inc. announced plans to sell its WWAY property in Wilmington, N.C. to Morris Network, Inc. The deal marks the first in a series of station dispositions taking place as part of a merger agreement between Raycom and Liberty Corp. The transaction is expected to be completed early in the first quarter of 2006 and carries a price tag of $18,500,000.

Raycom currently owns and operates 37 television stations. WWAY is one of 11 stations to be sold in connection with its merger.

"We love the Wilmington market and hated to sell this great station," said Paul McTear, Raycom president and CEO. "Morris shares our values and our concern about employees, communities and the public trust. We could not have found a better home for WWAY."

Quantel Promotes Ray Cross to CEO

NEWBURY, ENGLAND

Ray Cross has been promoted to CEO of Quantel as part of a strategic initiative to speed up the deployment of its generationQ technology.

As part of the initiative, Richard Taylor, who served as chairman and chief executive and Paul Kellar, director, research and development, will step down from their operational roles. Brian Paisley and Martin Mulligan will continue to lead the broadcast and post/DI divisions, respectively.

"Richard and Paul have successfully navigated Quantel practically from its birth in the mid 70s right through to the launch of the current generationQ range of products," Cross said. "This is a terrific accomplishment and the company and our customers owe them a debt of gratitude for the strength of their vision.

Telestream Appoints New President/COO

NEVADA CITY, CALIF.

Executive changes within Telestream were recently announced. David Heppe was promoted to president and chief operating officer. Dan Castles, chief executive officer, will be playing a more active role in directing the company's FlipMac4 business.

"Over the past eight years, Telestream has experienced high growth and gained a strong position in the broadcast industry segment," said Castles. "Now we have some unique opportunities to expand beyond that into broader market segments."

For the past seven years, Heppe had been in charge of worldwide sales and marketing programs for Telestream and was most recently senior vice president of sales and marketing.

JVC Chooses Yanagi For Marketing Director

WAYNE, N.J.

Craig Yanagi has been named national marketing director for creation products at JVC Professional Products Company. Yanagi will be involved in market analysis, business planning and development, new product launches and sales forecasting.

"We are pleased to have someone of Mr. Yanagi's experience and caliber join JVC," said Robert Mueller, JVC Professional Products Company executive vide president.

Yanagi said, "I am excited to become a part of the JVC team whose reputation for full-featured, high quality products is confirmed by the top tier costumers they serve."

Ellis to Lead Chyron Worldwide Sales

MELVILLE, N.Y.

Chyron has hired Steve Ellis as its vice president of worldwide sales, replacing Rich Hadju.

Ellis has extensive experience in the marketing of professional graphics. He is a former vice president of sales for the U.S. and Canada for Vizrt and was director of sales for the U.S. and Latin America for Pinnacle Systems.

"The addition of Steve to our team is a testimony to the growing momentum that Chyron is experiencing worldwide with our real-time 2D and 3D graphics solutions for HD and SD production," said Chyron CEO Michael Wellesley-Wesley. "Steve will be instrumental in taking Chyron to the next level as we continue introducing new products and expanding our market."

WIN-LOSE RATIO

TOP ADVANCERS BROADCAST STOCKS (Dec. 23 – Jan. 6)

Young	+44.27%
Acme	+5.65%

TOP DECLINERS BROADCAST STOCKS (Dec. 23 – Jan. 6)

Lin TV	-6.18%
Nexstar	-5.33%

TOP ADVANCERS TV TECH STOCKS (Dec. 23 – Jan. 6)

LSI Logic	+10.35%
Ciprico	+10.10%

TOP DECLINERS TV TECH STOCKS

Belden	-3.28%
Tektronix	-2.61%

To have your company listed, contact Tom Butts at tbutts@imaspub.com.

TV Tech STOCKS as of January 6

Company Name	52-Week Range	December 23	January 6	% Change
Avid	35.78 – 68.35	53.70	57.36	6.81%
Belden	17.65 – 26.00	25.90	25.05	-3.28%
Ciprico	3.70 – 5.98	5.05	5.56	10.10%
Harmonic	4.08 - 12.40	4.93	5.35	8.52%
Harris	26.94 – 46.71	44.07	46.58	5.69%
LSI Logic	5.01 – 10.75	8.21	9.06	10.35%
S-A	26.73 – 43.90	43.00	42.98	-0.05%
Scopus	5.90 - 7.51	6.40	6.63	3.59%
SeaChange	5.07 – 17.00	8.24	8.03	-2.55%
Tektronix	20.97 – 29.90	29.11	28.35	-2.61%

Broadcast STOCKS as of January 6

Company Name	52-Week Range	December 23	January 6	% Change
Acme	3.30 - 6.24	3.54	3.74	5.65%
Belo	20.74 - 25.35	21.73	22.05	1.47%
Emmis	15.94 – 24.49	19.93	20.47	2.71%
Entravision	6.90 – 9.50	7.26	7.02	-3.31%
Fisher	41.43 - 52.60	43.57	41.71	-4.27%
Gray	10.55 - 16.22	9.63	9.20	-4.47%
Hearst Argyle	23.15 - 26.34	23.92	24.10	0.75%
Nexstar	4.09 – 9.27	4.50	4.26	-5.33%
Lin TV	10.96 – 19.03	11.82	11.09	-6.18%
Paxson	0.37 – 1.99	0.91	0.91	0.00%
Sinclair	7.25 - 10.07	9.36	9.19	-1.82%
Liberty	34.32 - 48.05	47.08	46.87	-0.45%
Univision	23.52 - 31.17	30.14	31.04	2.99%
Young	1.70 – 10.74	2.62	3.78	44.27%
Tribune	30.05 – 42.17	30.52	30.89	1.21%
Meredith	44.51 - 53.04	51.83	53.04	2.33%
EW Scripps	48.85 – 52.91	48.03	49.58	3.23%

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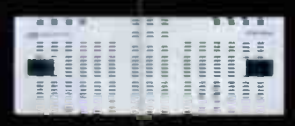

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