From Camera to Booth to Truck with Telecast Fiber Systems
PAGE 19 ADVERTISEMENT

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WHAT'S INSIDE

Comments Collide

Parties weigh in on federal subsidy

by Deborah D. McAdams

WASHINGTON

If public response is a metric, the digital transition remains a long, hard slog.

The National Telecommunications and Information Administration, the agency in charge of the federal government's plan to distribute coupons for digital-to-analog converters, received nearly 100 comments on its proposed implementation. The comment period ran from July, when the NTIA issued its Notice of Proposed Rulemaking on the plan, through the end of September. Responses ranged from confusion to objection.

Richard Dabney and Scott Donaldson said converters should be free, since the digital transition wasn't the public's idea. D. Spencer Pope and Charles Soper thought the whole coupon scheme was wasteful.

"Last time I checked," Soper's filing said, "you could run down to your local Worst Buy and get a digital TV for less than $300," he wrote. "I have to personally think that if you can't afford even a modest digital TV, that maybe you shouldn't be spending so much time in front of an analog TV."

Robert Ferguson asked the NTIA to "please send a coupon for HDTV conversion to Robert Ferguson" in Illinois, and Sophie Manion requested the "necessary form for the converter boxes for HDTV use."

The boxes are designed to

CONVERTER, PAGE 28

ANALYSIS

'GooTube' Impact on TV Unclear

Will Google become the sixth network?

by Gary Arlen
Special to Television Technology

BETHESDA, MD.

Beyond the sheer awe surrounding Google's $1.65 billion bet on YouTube is a fundamental question about the future of TV—or more specifically about future video consumption.

Media executives and analysts quickly pondered whether, and how, the YouTube audience will watch traditional television. YouTube's deals leading up to the Google alliance—including pacts with NBC Universal, Warner Music, Sony and CBS—added to the uncertainty. Those alliances suggest both a new reliance on Internet distribution and a hedge for viewers to jump between "old" TV and the new Web video options.

The Google/YouTube alliances (dubbed "GooTube") accelerates a number of ideas that have been bubbling through the cable TV, broadcasting and Internet worlds for more than a decade. Foremost among them is Video-on-

GOOTUBE, PAGE 20

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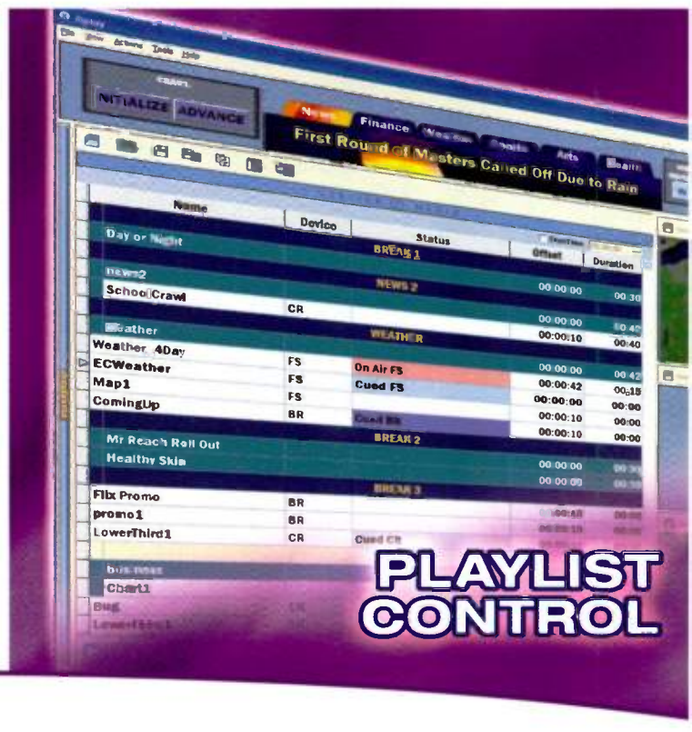

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CONTRIBUTING WRITERS

Media Server Technology

Karl Paulsen

Media servers, storage and networking technologies for television systems historically follow in the footsteps of IT systems. The latest global revolution in IT storage is now driving content flow for television systems. As such, our industry finds itself continuously... p. 30

Let There Be Lighting

Andy Ciddor

Like scriptwriting, continuity is an art that will be practiced until at least several days after hell freezes over. While we eventually reach the point where we can build all of the elements for a production inside a computer, the need for a story to tell will never diminish... p. 34

News Technology

Harlan Neugeboren

I know that budgets are tight and we all have enough to do in our busy schedules and convincing management to go to yet another tradeshow may be impossible, but the Consumer Electronics Show is probably the one show besides NAB that every news professional... p. 42

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FROM THE TECHNOLOGY EDITOR

Train Wreck

I recently went to a reunion at my alma matter, attended by alums whose graduation dates spanned several decades. Between scheduled events there was plenty of time to socialize and engage in small talk. In the process of introductions, I was identified as someone who knew something about TV.

The conversation quickly turned to large screen TV, with the usual questions about the "best" type of display to purchase and when did I think prices would go down. In the process, I happened to mention the latest timetable for the cessation of analog broadcasting.

There was a brief silence and then one of the attendees asked, "Are you telling me that the TV I just bought a couple of years ago won't work after February 2009?"

Of course the answer was that without a digital tuner or a converter, no analog receiver would be making pictures after that date.

You could have heard a pin drop!

As it happened, none of the group at my table had heard of the plan to eliminate analog. What made this all the more interesting was that these people were college graduates and several had advanced degrees. They were obviously well read and kept up with current events. Yet not one of them was aware of the U.S. digital television game plan!

Obviously, those within the government charged with getting the message out to the masses aren't doing their job.

I had the floor and proceeded to "tell all" about the TV transition, including the federal $40 STB food stamp plan. As I explained the digital facts of life and fielded more questions, I could see that television retailers weren't providing much useful information either.

This type of story has been repeated at broadcast gatrherings many times; but little seems to have been done about it.

The federal government, broadcasters and retailers have to start getting the digital transition message out now. If Mr. and Mrs. America only learn about it the hard way on the morning of Feb. 18, 2009, there's going to be a train wreck of colossal proportions.

In the past, the government communicated very effectively about such things as war bonds, polio immunizations, civil defense and AIDS prevention. Granted, life and limb are not really at stake here, but these and other such campaigns prove that the government can effectively pass information to the American public. Should informing the public about the quantum shift to digital broadcasting be any more challenging?

Get some PSAs on the air, buy some newspaper space, put up a billboard or two. Tell them about pulling the analog plug. Tell them about digital tuners and STBs. Tell them about the necessity for good antennas. Just tell them!

James O'Neal
Technology Editor
joneal@imaspub.com

LETTERS

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

More Power

Dear Editor:

Regarding the review by Carl Mrozek in your Aug. 9, 2006 issues (pp. 46-47) of our UCR401 receiver, SM transmitter, and RM remote unit, first I would like to thank **TV Technology** and Carl Mrozek for the review.

However, I would like to point out some inaccuracies. The reviewer claims that with freshly charged NiMh AA batteries, he got "power for two to three hours of active operation."

Input from our customer base, corroborated by our own internal testing, puts operation time for the SM transmitter at about 4.5 hours from a single charge. The UCR401, with two AA batteries, should run for far longer.

Also, the reviewer states that when testing the SM and UCR401 outdoors, "distances of 40 to 50 feet posed little problem, provided there was a clear line-of-sight beteween transmitter and reciever."

These units are routinely used at distances of 400 to 500 feet with the same results, as long as a clean operating frequency is selected.

Karl Winkler
Lectrosonics, Inc.
Rio Rancho, N.M.

Carl responds:

Thank you for this opportunity to report on more recent, rigorous testing with the Lectrosonics' SM transmitter and UCR 401 receiver.

Recently, I used the units when covering pack burro races in central Colorado. These arduous races involve men, women and burros running marathons (12-30 miles) up and down mountain trails—some barely passable in Jeeps. It provided an ideal opportunity to test the operational range of both the SM transmitter and UCR 401 receiver.

I put the SM transmitter in a saddlebag straddling a pack saddle with the tram (lav), covered with a Koala windsock, clipped to the outside edge of the saddlebag. To my amazement, I was able pick up the comments and heavy breathing of the man and hoof steps of his burro from a distance possibly exceeding 1/4 mile, when there was little but thin mountain air between the racers and myself. This is a casual and conservative estimate, as I was too preoccupied with covering the race to measure the distance precisely.

Moreover, I was actually able to use the system to anticipate the appearance of my man and his burro when waiting for them to appear out of the forest or from around the mountain, by listening for them in the headphones.

Often, I heard them approaching several minutes before they trotted into view 100-200 meters away. They frequently were easily two to four times that distance away when I first picked them up on the trail.

The NiMH battery in the SM transmitter lasted nearly five hours in transmit mode, starting roughly an hour before the race and lasting to nearly the four-hour mark of my subject's race. The UCR 401, which I turned off around half the race, had plenty of reserve power after my team crossed the finish line 4 1/2 hours later, using a pair of Panasonic industrial grade AA batteries.

As the finish times of all man/woman-burro teams were logged to within a few seconds, the Leadville Pack Burro Race provided a unique opportunity to accurately gauge the active transmission life of a freshly (three days) charged 1.2 V NiMH AA battery and heavy duty alkaline AAs. Regrettably, I didn't have a comparable opportunity to push the Lectrosonics' unit to its operational limit prior to publication of the review. Then, as always, I erred on the side of caution when estimating operational times, distances and other performance parameters.

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DoD Uplinks Moving to 2 GHz BAS Band

Broadcasters voice concerns over ENG interference

by Craig Johnston

SEATTLE

The Department of Defense is moving from its 1.8 GHz Space Ground System spectrum in a chain reaction to free up 1.7 GHz spectrum for an advanced wireless device spectrum auction.

Broadcasters are concerned about the FCC's authorizing the DoD uplink spectrum shift because they fear it will interfere with TV stations using the 2 GHz band for electronic newsgathering. They point to the fact that the DoD uplinks are tasked with tracking and transmitting to non-geosynchronous satellites, which range from horizon to horizon.

They have also voiced concern with the 1-10 kW transmitting power authorized for the uplinks, and the amount of side lobe radiation that could be generated from those high-powered transmissions.

Because ENG receive-only antennas are usually located on the tallest natural or man-made structures available to allow live-shots from almost anywhere in the broadcast market, these sites will be particularly susceptible to such side lobe radiation, broadcasters say.

The Society of Broadcast Engineers, National Association of Broadcasters and Association of Maximum Service Television have all filed objections with the commission, claiming the uplinks were incompatible with ENG operations in the same band. To date their objections have been denied.

TIMELINE QUESTIONS

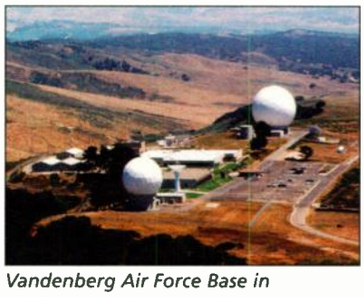
TV Technology spoke both on and off the record with broadcast organizations about DoD's uplink spectrum move, then put some of those organizations' questions to the DoD.

The unknown timeline was one element that worried broadcasters, to which a DoD representative replied that the [2 GHz] capability "will be added beginning approximately 2010 at a yet to be determined location."

From previous front and back-door conversations broadcasters have had with DoD, they expect Vandenberg Air Force Base in California to be the first uplink to be changed.

Broadcasters suspected that a delaying factor in DoD's decision to transition from 1.8 GHz to 2 GHz operations was the lack of 2 GHz capability in current satellites. When asked if current satellites were, in fact, agile enough to handle 2 GHz, DoD representatives said that the department "has programmed and budgeted for the transition to the 2GHz band. DoD still plans to utilize the spectrum currently authorized for satellite operations in the band 1755-1850 MHz. This was established via a DoD policy memo that mandated a dual-band capability for future satellites. Those systems already on orbit or awaiting launch will be dependent on access to the 1755-1850 MHz frequency band for decades."

That DoD plans to use both its 1.8 GHz band spectrum and the 2 GHz band struck Dane Erickson, chairman of SBEs' FCC Liaison Committee as inconsistent.



Vandenberg Air Force Base in California could be the first uplink to be changed.

"If those uplinks are staying there, then what's the problem with the displaced government microwave links that are getting moved to 1.8 gigs?" he asked. "If they're saying that these uplinks are going to continue at 1.8 gigs, then this is just a spectrum grab for additional bandwidth, and it's not because the uplinks have to be vacated out of 1.8 gigs to make room for the fixed point-to-point links that are being bumped out of 1.7 gigs."

Asked what measures DoD will take to on the uplinks to reduce side lobe radiation to the levels that will meet the FCC's noise threshold degradation requirements, the DoD said that its satellite transmissions "are designed to meet the antenna radiation suppression standards established by National Telecommunications and Information Administration [NTIA] as the President's primary advisor for federal use of spectrum. Within the existing budgetary and programmatic constraints, the department is investigating the best method for effectively sharing spectrum with the incumbent Broadcast Auxiliary Services [BAS] given the importance of both communities."

CLEARLY SPELLED OUT

Ericksen said he's unfamiliar with NTIA's radiation suppression standards, but noted that the FCC's standards are clearly spelled out. Normally when a new microwave user comes into a band, it is required to demonstrate it will not interfere with incumbent services in that spectrum. EIA/TIA Telecommunications System Bulletin 10-F, "Interference Criteria for Microwave Systems" allows up to a 1 dB degradation of a protected receiver's threshold.

There are methods to reduce side lobe leakage from uplinks, like installing "pie plate" shrouds around the edge of dishes. Erickson doubts there is room for such shrouds within the existing radomes, the hemispherical covers surrounding the top of the uplinks.

"However, if DoD can meet that 1 dB threshold, there will be no problem for TV's 2 GHz operation," he said.

The FCC has ruled that the military will have to coordinate with incumbent users of the band during the spectrum move.

"The development of a spectrum-sharing criteria between DoD and existing users at 2 GHz will require the Department to share information about its operations," the DoD representative said, regarding the move. "Specifically, the earth station transmit characteristics will be the foundation for creating an equitable sharing environment. Coordination will be different for each site and based upon transmit power, antenna elevations, local topography, and the BAS environment."

Broadcasters have pointed out that the horizon-to-horizon tracking of satellites by DoD uplinks will require real-time frequency coordination, and that the relative difference in transmitting power between DoD uplinks and ENG operators means only broadcasters will experience interference.

It should be noted that in making their arguments, broadcast organizations have been careful not to suggest their ENG live shots are more important than mission-critical military transmissions to the satellites. But they pointed to the critical role such ENG operations play in alerting the public during manmade or natural disasters. ■

Is Trucker TV A Threat to BAS?

NAB, MSTV join SBE in opposing proposed low power TV service

by Craig Johnston

SEATTLE

The National Association of Broadcasters and the Association for Maximum Service Television have joined the Society of Broadcast Engineers in opposing a request from Clarity Broadcasting LLC to have the FCC approve a low-power multchannel over-the-air DTV service for 10 of its Flying J truck stops in the U.S.

Clarity proposes the service to use 99 percent of the 2 GHz band, the broadcast auxiliary service spectrum. These frequencies are a lifeline for ENG and other services, where broadcasters are already fighting off the spectrum relocation Department of Defense uplinks among other proposed incursions.

In their comments, the broadcast organizations defended the BAS spectrum, poking holes in various arguments Clarity made to advance its case. Many of the organizations' rebuttals are of a legal nature and argue that Trucker TV should not be granted the CARS license. They maintain that while Clarity asserts truckers are underserved with television, mobile DBS dishes are readily available to truckers and motorhome owners, and the program content channels Clarity proposes to deliver are available on DBS.

But it's the technical parts of Clarity's plans that scare broadcasters. When Clarity originally applied for licenses for three of its Flying J truck stops over a year ago, the FCC granted three experimental licenses for tests at the sites, one in California and two in Utah.

SBE sent its member Jerome Kalke, accompanied by a local television station's ENG repeater van, to each of the three tests. Southern California frequency coordinator Howard Fine attended the Frazer Park, Calif. test, on I-5 at the Los Angeles County/Kern County line. (In its FCC filing, SBE terms the *tests* in Utah only "demonstrations," and methodology of the California test "seriously flawed.")

SBE's own late September filing to the commission in response to Clarity's interpretation of its tests charged Clarity with non-cooperation with observers at the three sites, including allowing no independent verification of power levels transmitted and presenting no system drawings when requested.

Clarity's FCC filing regarding the

TRUCKER TV, PAGE 8

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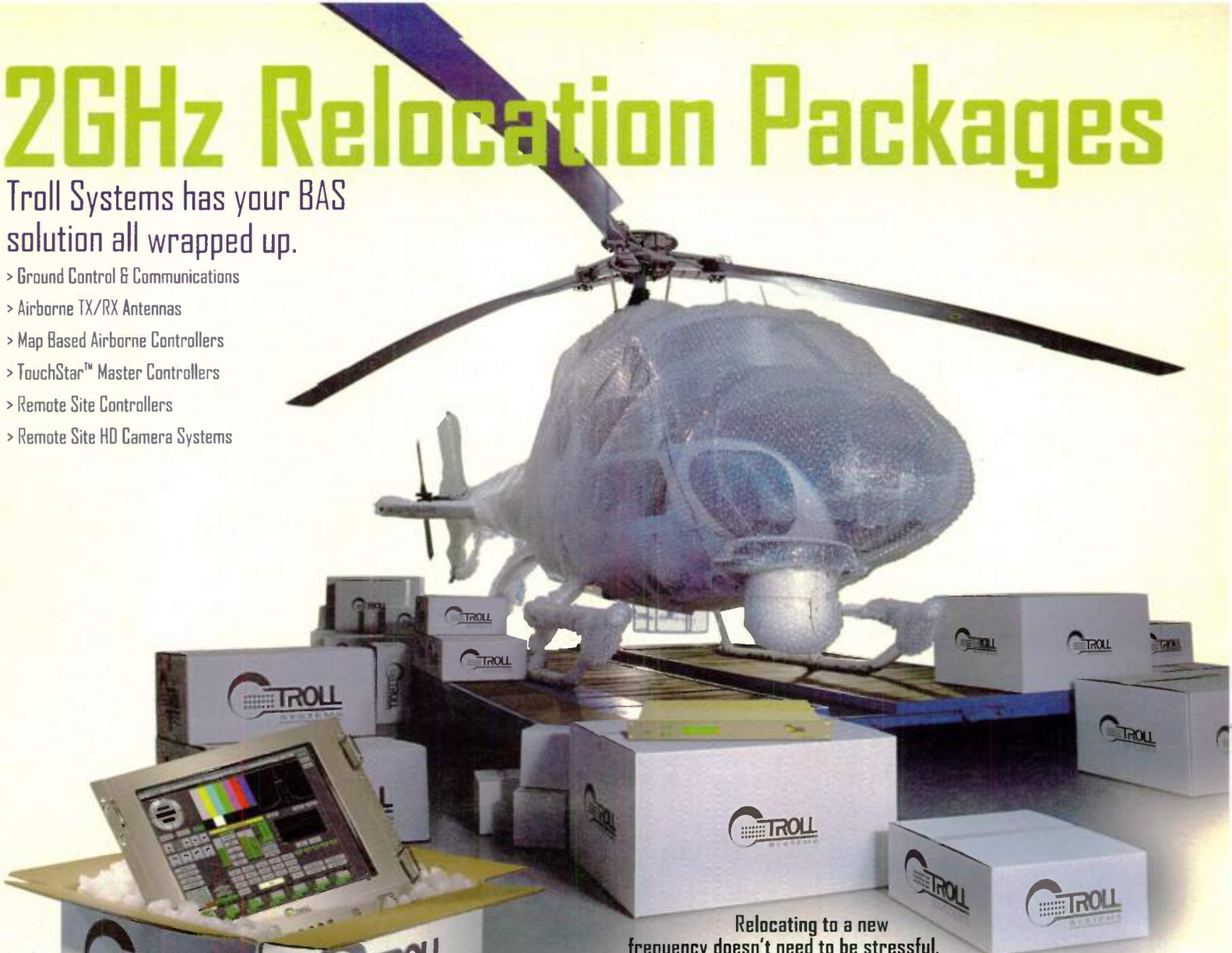

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BAS Transition Scores First Switchover

Yuma, Ariz. NBC affiliate first in nation to change to new channel plan

by Robin Berger

YUMA, ARIZ.

Yuma, Ariz.-El Centro, Calif. is the first TV market to relocate to its new home in the 2 GHz spectrum band, thanks to an arrangement forged by Sprint Nextel and the Federal Communications Commission in February 2005.

Sprint Nextel is covering broadcasters' expenses to move from the spectrum they currently use to send live and taped feeds from their trucks to their stations in order to move some of its own operations into the bandwidth. The project is slated for completion by September 2007.

By mid-October, all 1,098 Broadcast Auxiliary Services licensees had been contacted, and 102 frequency-relocation agreements were signed with Sprint Nextel, said project head Michael Degitz, the company's vice president of spectrum resources.

Of the 102 signed licensees, 63 submitted purchase orders for new equipment; Yuma-El Centro was the only market that actually re-banded, he said.

KYMA Chief Engineer Robbie DeCorse tunes in a live shot at the station's NuComm Troll system.

"Even though individual stations have purchased and installed equipment, they cannot relocate until the entire market is ready," said Cindy Hutter Cavell, Sprint Nextel's director of broadcast engineering for the 2GHz project.

When asked about the feasibility of completing the project by September 2007, Degitz replied, "We're continuing to put out our best effort to get it done by then.

"The program's picking up momentum now—all major obstacles are behind us. We're getting a lot of deals sent in to us and we'll be completing more contracts in the near future."

CUTTING EDGE

"Located in [Nielsen demographic] market 170 [out of 210], we don't normally have cutting-edge technology to use at our station," said Robbie DeCorse, chief engineer at KYMA, a Sunbelt Communications-owned NBC affiliate. "Our analog 2 GHz [gear] was purchased in 1992," he said, noting that some of it was no longer supported by the manufacturers.

In exchange, it received Nucomm's CR6D central receiver, ChannelMaster TX1/RX1 portable transmitter/receiver and Newscaster VT2 van transmitter, plus Microwave Radio Communications (MRC) ProScan III antenna, Troll Systems studio controller and other new gear.

Sprint Nextel also paid for the station's FCC BAS licensing fees, reimbursed KYMA for staff expenses dedicated to the relocation, and contracted a SignaSys training course to familiarize the engineers and master control staff with the new equipment. In addition, it contracted Western Technical Services (an MRC dealer)

SWITCHOVER, PAGE 12

Trucker TV

CONTINUED FROM PAGE 6

tests claimed: "To be clear, there was no RF interference when the system was operated at full power that is authorized in the Clarity experimental license..."

Kalke is quoted in the SBE response: "I know of no actual interference testing with a plan or anything scientific in nature."

NAB and MSTV warned the FCC of potential interference to fixed, receive-only sites in the vicinity of the truck stop transmitters, and to possible interference to ENG repeater vehicles facilitating live shots and video feeds from those truck stop vicinities.

"The granting of a cable television relay service license to Clarity's direct-to-consumer, multichannel video programming distribution service would turn the commission's CARS rules on their head and would materially harm local broadcast services critical electronic newsgathering operations, to the detriment of the viewing public," NAB and MSTV said in comments filed with the commission.

The organizations agreed with SBE's assertion that Clarity's tests were flawed, submitting their own engineering analysis to make their case.

"Clarity's reliance on incorrect calculations and its proposed antenna downtilt omits consideration of several key factors which assure that interference will occur," the associations said.

In the case of the one fixed receive-only ENG site near the California test site, SBE noted the ENG receiver is terrain-blocked from the truck stop transmitter, and thus not a good indicator of interference that might be caused to non-blocked receive-only sites similarly distanced from other truck stop locations applying for licenses.

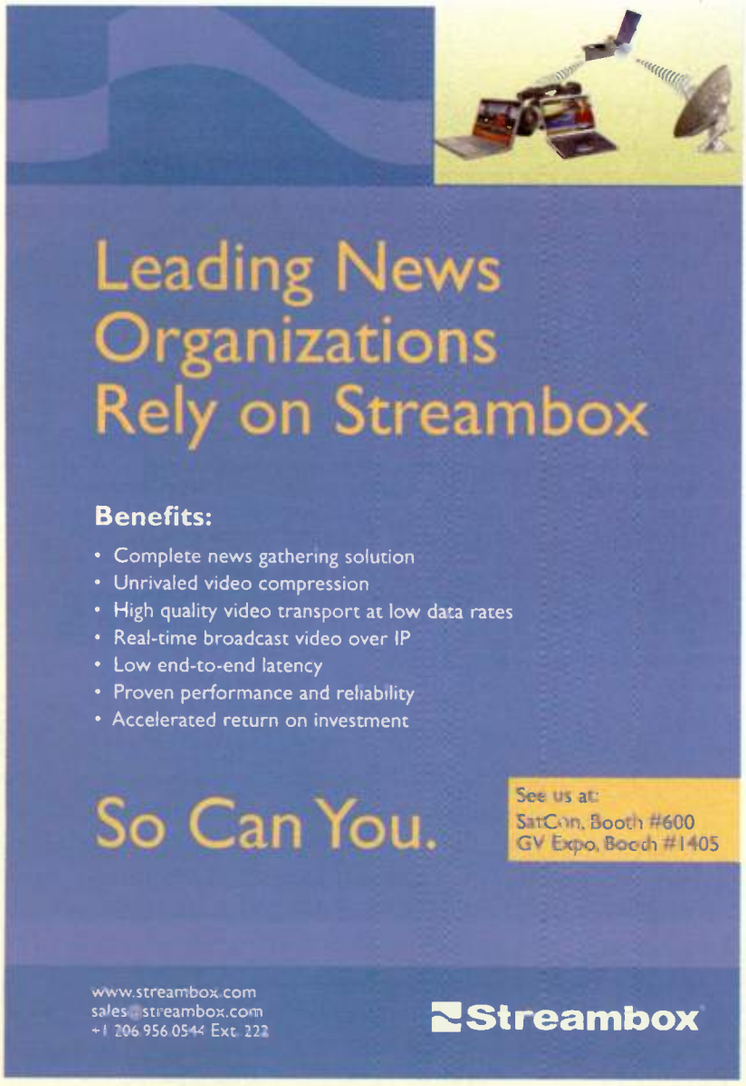
'VOLUNTARY' SHUTDOWN

Regarding ENG relay trucks operating in the 2 GHz band, Clarity told the commission that its understanding is that "electronic newsgathering (ENG) receivers mounted on vehicles or otherwise available for mobile use in the 2025–2110 MHz band are extremely rare if used at all." SBE estimates there are at least 100 such ENG relay platforms, including helicopters.

Clarity has pledged to temporarily shut down its individual Trucker TV operations immediately whenever broadcasters claim interference. SBE's filing questions whether a number of bogus callings of "wolf" might bring individual truck stop managers to ignore such shutdown obligations.

If the 10 Trucker TV sites applied for seems like small potatoes, objectors warned that Trucker TV could grow. Flying J's Web site claims it has 178 "travel plazas" which could apply for such licenses, and there is nothing to stop the balance of the approximately 900 truck stops from applying for similar licenses, not to mention the nearly 4,000 private RV parks and campgrounds.

Those worried about Clarity's possible incursion into the 2 GHz band are not the only television people warring with the company. Several networks have accused Clarity of replacing ads in their programming running in Flying J's truck stop TV lounges with commercials more specifically targeting truckers. The networks have sought an injunction prohibiting the practice. ■



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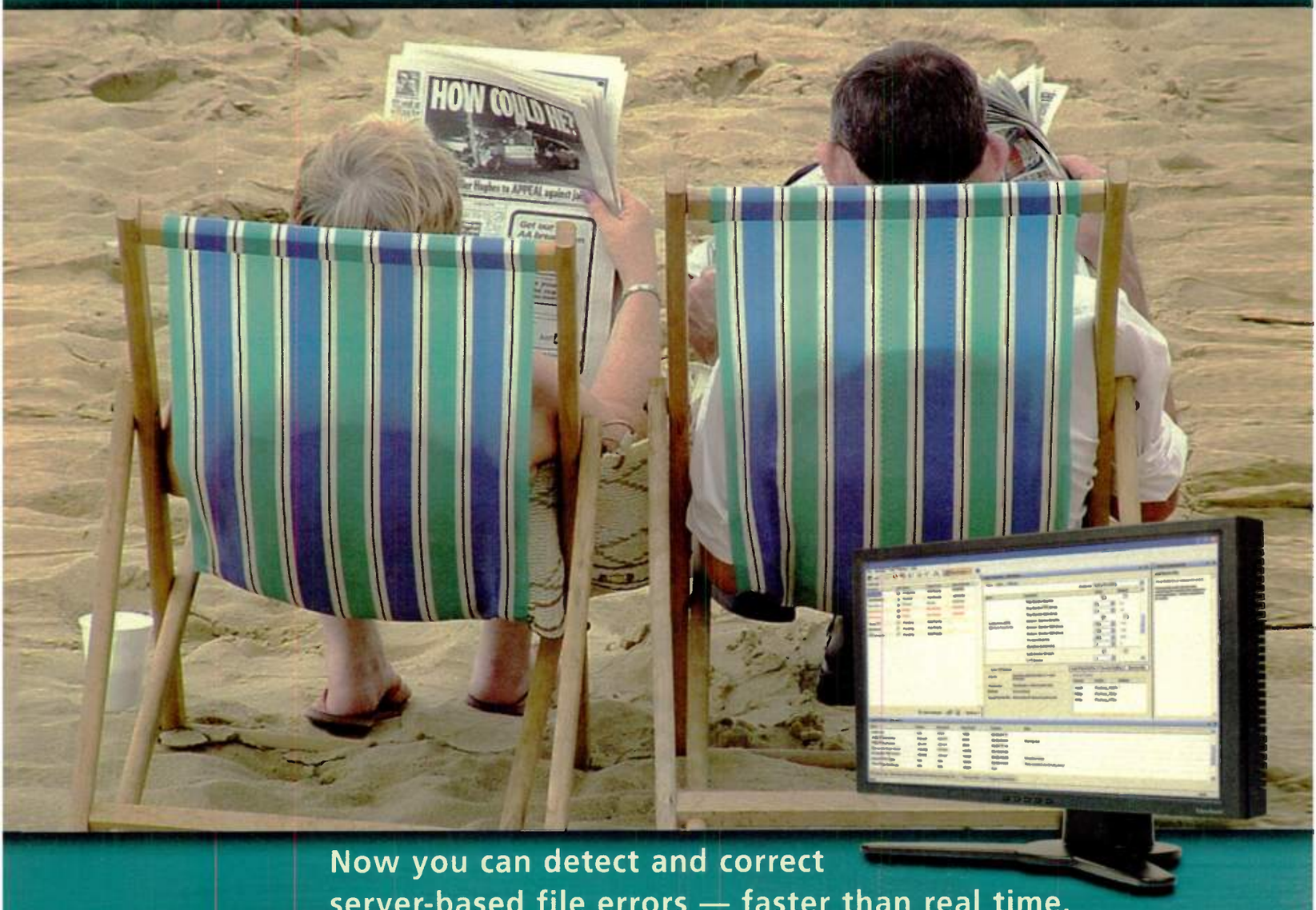

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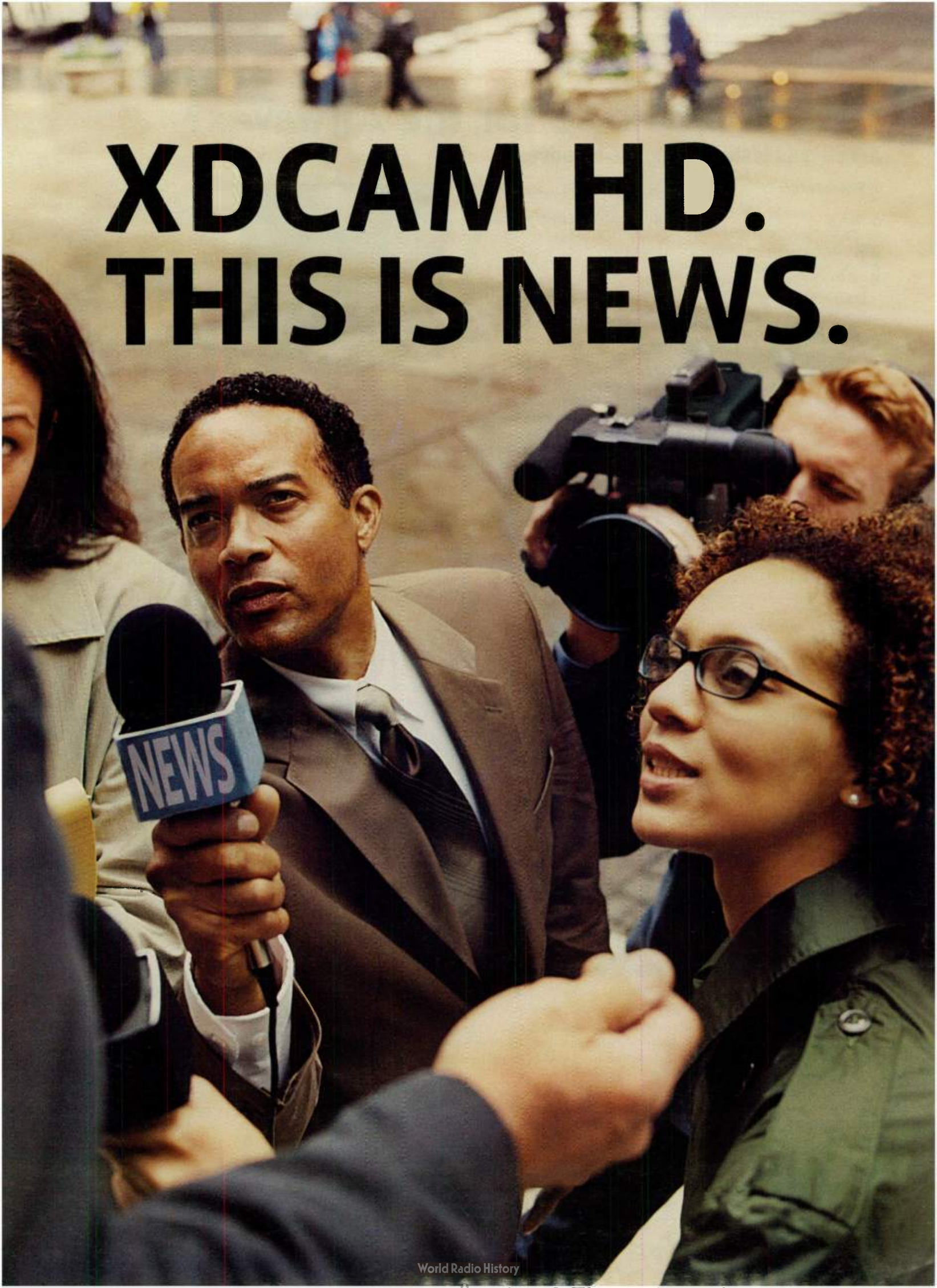

World Radio History

Last Great Hope for the Airwaves?

A-VSB gets tested for mobile broadcasts

by Robin Berger

LOS ANGELES

Proponents of a new digital TV methodology are gearing up for tests by the Communications Research Centre in Ottawa, Canada, hoping for a nod from the Advanced Television Systems Committee, pending the results.

Advanced-VSB, or A-VSB, is a system-level enhancement to the ATSC's vestigial side band modulation standard. It claims to improve transmission to receivers under dynamic multipath conditions, including receivers that are moving or otherwise portable.

This claim by consumer electronics giant Samsung and transmitter developer Rohde & Schwarz—which jointly developed the proposed standard and have submitted it to the ATSC for approval—results from three main factors: an SRS (supplemental reference sequence) added to the transmitted signal, a low signal-to-noise turbo (forward error-correction code) stream, and a new single frequency network application tool.

The A-VSB single frequency network uses different techniques than the current ATSC's A/110 standard to synchronize the exciters, according to Mike Simon, advanced technologies manager for the broadcast division of Rohde & Schwarz.

CRC's lab testing was expected to begin the third week of October and last for two to three weeks, Simon said. If all goes well, field tests will follow.

SINCLAIR BACKS A-VSB

Sinclair Broadcasting is extremely interested in A-VSB because "it is the only proposal out that will enable mobile service reception to small portable devices, as well as larger ones," like automobiles, said Nat Ostroff, vice president of advanced technologies for Sinclair Broadcast Group. Ostroff is also president and chairman of transmitter maker Acrodyne Industries.

"Once it becomes a standard, [broadcasters] can begin to address what [they] can do as local providers of information, news, sports, weather, traffic... to automobiles, cell phones, iPods, laptop computers, small screen TV sets running at the ball park or on batteries on your lap," Ostroff said

This second market is a crucial supplement to the traditional one, which is currently 85 percent controlled by cable and satellite providers, he said.

An A-VSB prototype set-top box flanked by two spectrum analyzers

"It's the last great hope for free, over-the-air broadcast," Ostroff said. "Without this kind of wireless connection to your audience, one begins to argue, why even broadcast your signal? You might as well just deliver it with fiber—you don't need an FCC license to be a cable and satellite programmer."

Sinclair has been behind mobile broadcasts ever since the digital TV initiative got under way. Ostroff himself gained the spotlight at NAB2000, wielding a portable Nokia MediaScreen presentation to argue for adding COFDM to the DTV transmission standard.

Since then, Sinclair tested the LG Electronics enhanced-VSB amendment, which added forward error-correction coding layers. It was adopted by ATSC in 2004, but has not generated much enthusiasm.

"E-VSB did not enable portable services—it marginally improves the reception of the signal in the traditional setting," Ostroff said.

In early September, A-VSB was tested at a Sinclair Broadcasting station in Buffalo, N.Y. in what was described by Ostroff as a "sanity check" before the ATSC tests.

The WUTV tower's signal ran through one of Sinclair's low-power

A-VSB, PAGE 23

Switchover

CONTINUED FROM PAGE 8

and truck integrator Wolf Coach, respectively, to install the receive site and truck equipment.

Commenting on the new setup, "with digital it's either crystal clear or it's in black—no noise or color shift—which makes the picture look great," DeCorse said. He also noted the station's new-found ability to get live shots from previously unreachable locations, like Cibola High School. "Now we get a live shot with ease."

But, as typical of new equipment, there were a few glitches.

The NuComm receiver initially knocked out the subcarriers, cutting communication. But, said DeCorse, "as soon as we told them what the problem was, they were able to correct it right away—now it works great."

A problem with hooking up the portable unit used in KYMA's El Centro bureau with KYMA's editor—"green lines through the video"—was fixed by "putting the frame sync in line to correct the phase problem," using in-house spare parts, said DeCorse.

Sprint Nextel reps met with DeCorse and KYMA GM Paul Heebink in April 2005 to explain the process of narrowing the station's channel plan. R.J. Russell, Sprint Nextel's senior broadcast engineer for the West Coast, was KYMA's former operations manager and DeCorse's ex-boss, said DeCorse.

KYMA drew up an inventory of its equipment, which was verified by a crew from Western Technical Services and Wolf Coach by July 2005, when quotes began to roll in for the new equipment. KYMA staffers took training classes with SignaSys in April 2006.

Installation of the new equipment began in June 2006. "It only took three days," said DeCorse.

Between June and September, the station operated with the new gear in the old channel plan, "working out all the bugs and kinks," said DeCorse. On Sept. 22, the station switched to the new channel plan.

DeCorse advised stations anticipating their own spectrum relocation to be mindful of the Sprint Nextel timeline and Broadcast Instruction Guide.

"If you're unsure [of] what to do next, contact your representative at Sprint Nextel to help guide you through the process," he said. And, he said, be sure to go over all manufacturer quotes with Sprint Nextel. ■

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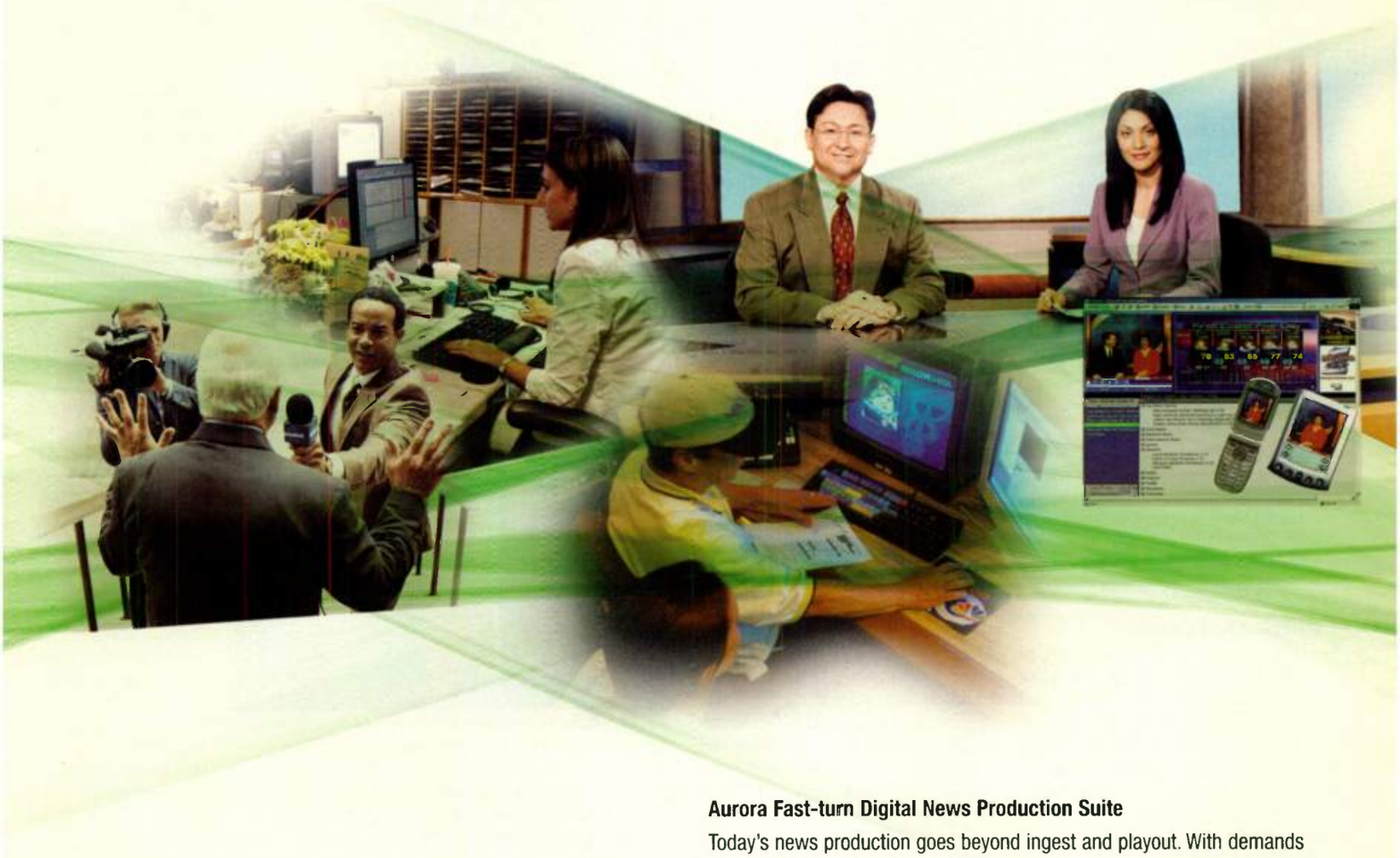

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World Radio History

The Flipside of A-VSB

Transmitter makers adjust to mobile video market

by Robin Berger

LOS ANGELES

Transmission equipment providers to the broadcast industry admit to being somewhat stymied in helping U.S. TV broadcasters transmit mobile services until the ATSC rules on Advanced-VSB.

"The ATSC system itself is not really designed for mobile operations," said Rich Schwartz, Axcera's director of marketing and product management. "The only possibility for mobile operation will be A-VSB."

Schwartz and other members of the ATSC's Specialist Group on Transmission (TSG/S9) committee acknowledged A-VSB's data coding technique, which was conceived to improve reception in an environment more plagued by ghosts and impairments. They also noted techniques A-VSB proposed for a Single Frequency Network, which advocates believe will facilitate mobile transmission.

PROS AND CONS

Brett Jenkins, vice president of engineering for Thomson Broadcast & Multimedia division, is not convinced Single Frequency Networks are necessary.

"There's nothing in the documentation that I have reviewed that indicates any real advantage in SFN one way or another," said Jenkins. "To be able to take your car and drive it from the East Coast to the West Coast and never change the tuner, then yes, you need some Single Frequency Network technology. But there are digital radio systems and technologies out there that will retune to the new coverage area without loss of service."

Jenkins also foresaw red tape headaches.

"Deploying SFN [means] multiple transfer sites, multiple sites to manage," he said. "Every transmitter site has to be licensed—and tower space is hard to come by."

But Jenkins is optimistic about A-VSB's turbo stream and Supplementary Reference Sequence (SRS) components, which he believes will boost reception.

"The real winner with A-VSB is the SRS—it looks like it's going to provide receivers a way to perform very fast equalization of the received signal: the faster you can spit out a reference sequence, the less interrupted service you're going to have," he said. "[And] turbo coding is the latest and greatest error correcting code that's proven in real applications."

Joe Seccia, TV transmission platforms manager for Harris Corp. had other doubts about A-VSB, including its bandwidth trade-off.

"You need extra coding overhead to protect that A-VSB service, so, in reality it may take 3 megabits of bandwidth to achieve a 1.5 megabit throughput to an alternative device," said Seccia. "Broadcasters are trying to preserve and use that 19.4 megabits in the most efficient way possible. To take up a significant portion of it for data protection is potentially unattractive."

This view was shared by Dave Glidden, director, TV strategy and business development for Harris Corp., who compared VSB's offshoots to those of rival system DVB-T. He said network operators in Europe and Asia decided they couldn't afford to use DVB-H as the incremental mobile standard it was intended to be.

"You can't make an existing terrestrial network have the burden of supporting transmission to mobile devices because it has a different set of parameters," said Glidden. "It's going to compromise the number of channels you can deliver as well as the quality of the channels, particularly HD coverage."

At IBC, Thomson debuted its Elite line of transmitters, targeting mobile video applications.

BROADCASTERS' NEW ROLE

Although they don't discount the advent of broadcasters' mobile transmission services if a strong business case can be made for them, all noted challenges.

"It requires 1,600 television stations buying significant upgrades to their transmitters," said Glidden. Broadcasters would also have to buy additional transmitters if SNF were adapted.

And Axcera's Schwartz pointed out that since none of the mobile devices in circulation were capable of receiving an ATSC signal, broadcaster-provided mobile services would be "a long way off."

Handsets pose their own limitations for the fragmented U.S. broadcast industry that aren't faced by aggregators like Qualcomm's MediaFLO, whose customers get access to a number of virtual channels by tuning into one RF channel.

"[MediaFLO] can produce handsets that only have to receive channel 55," said Harris' Seccia. In contrast, to accommodate all the local RF signals on an A-VSB network, "the mobile device would have to have a very broad tuner."

Moreover, said Harris' Glidden, "You'd have to have a mobile carrier willing to have a more complex tuning mechanism in the phone, which would be more costly—and increase the switching complexity."

And RF video reception is already a major battery drain.

HERE AND NOW

"Mobile television, in general, is a very high priority for us," said Glidden, citing, major breakthroughs in Europe this year and the upcoming rollout of MediaFLO and Modeo networks in the U.S. But, he added, "We don't believe at this point that any of the ATSC variations are ideally suited for mobile television."

At NAB2006 Harris showcased its Apex digital exciter (the centerpiece of its Atlas Mobile and Ranger Mobile TV transmitter) and debuted Cool Play, a new DVB-H mobile TV transmitter for 1,670 mobile TV services, which offers a smaller, air-cooled (versus air conditioned), easy-to-install-and-manage alternative.

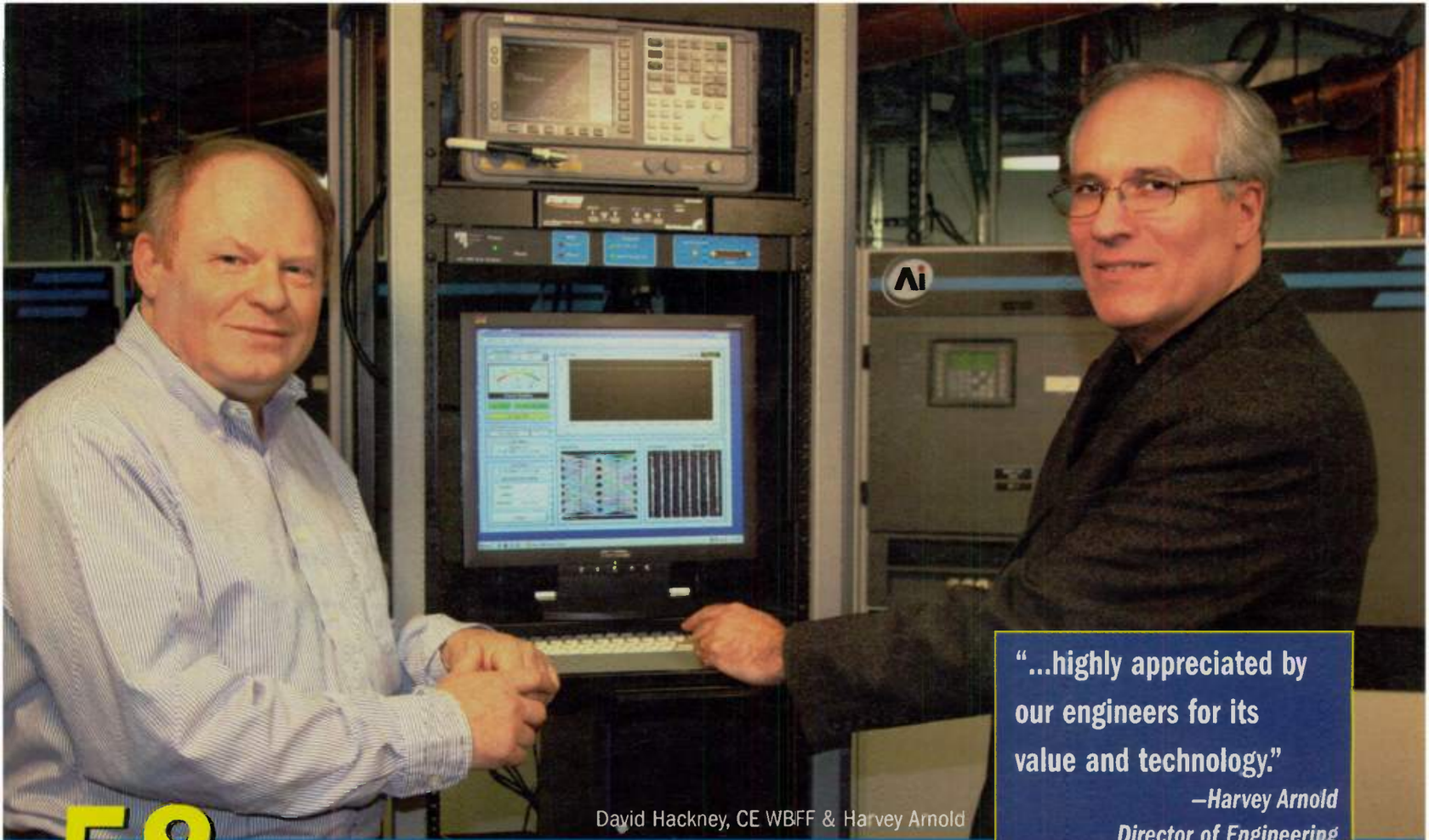
Jenkins also acknowledged this year's push to "pack more power in a smaller package," as power is 1) a significant cost in operating a mobile network, and 2) subject to stringent government allocation, particularly in Europe.

To that end, the company launched its Elite DVB-H transmitters at IBC. Elite also has a modulator/exciter called the Sirius which, said Jenkins, has "some breakthrough technologies [to] correct the nonlinear distortion of the amplifiers and multiple feedback references for more accurate linear correction."

NAB2006's ATSC Hot Spot featured Axcera's Axciter DTV exciter and distributed transmission system.

"We have a distributed transmission adapter that is capable of operating as an A-VSB adapter—it inserts the information into the signal to make the signal A-VSB compatible," said Schwartz. "Once the [A-VSB] standard is approved, we will implement the modes that are defined in the standard into the current hardware." ■

World Radio History



David Hackney, CE WBFF & Harvey Arnold

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–Harvey Arnold
Director of Engineering
Sinclair Broadcast Group

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*58 Stations include stations Sinclair owns and operates, programs or provides sales services.

Fiber Runs Advance Stadium Goals

HDTV demands promote fiber-optic cabling at sports venues

by Claudia Kienzle

CHESTER, N.H.

When HD production trucks pull up to stadiums to cover NFL games, the fiber optic-cabling and hookups they require are conveniently in place. But this luxury comes at a price—to the sports networks televising the games.

"Starting in the early 1990s, NFL contracts with broadcast networks stipulated that whenever a new NFL stadium 'came online,' or an existing stadium was renovated, the network affiliated with that league was responsible for laying fiber-optic cable in anticipation of HDTV, and that was a very costly proposition," said Peter Kallander, technical manager for CBS Sports.

Based in Chester, N.H., Kallander has tech-managed for all of the major sports networks, and has unique and extensive experience managing fiber cable installations at dozens of stadiums for CBS and previously for Fox Sports.

COST SHARING

Fox Sports was hit particularly hard by that NFL stipulation because they wound up cabling four or five NFC stadiums at a cost of about $200,000 to $400,000 each, according to Kallander, "and then other networks got to come in and use that infrastructure for free," Kallander said. "So in the late 1990s, the NFL issued a new contract that pro-rated the cost of fiber installation so that all networks holding NFL contracts would share the burden."

With that new contract language in place, Kallander said that things were "more equitable" when they then cabled Gillette Stadium, in Foxborough, Mass., home of the New England Patriots, because half of the $400,000 expense was assumed by CBS, which held the AFC rights, and the other half was split between Fox and ABC/ESPN.

"Once the networks shared the price, we couldn't just go in and cable it for CBS, which broadcasts in 1080i HD. We had to consider the needs of Fox and ABC/ESPN, which broadcast in 720p HD," Kallander said. "This meant laying single mode fiber-optic cable that supports 1080i, while running more expensive triax camera cable sufficient for 720p, and preferred by Fox and ABC/ESPN."

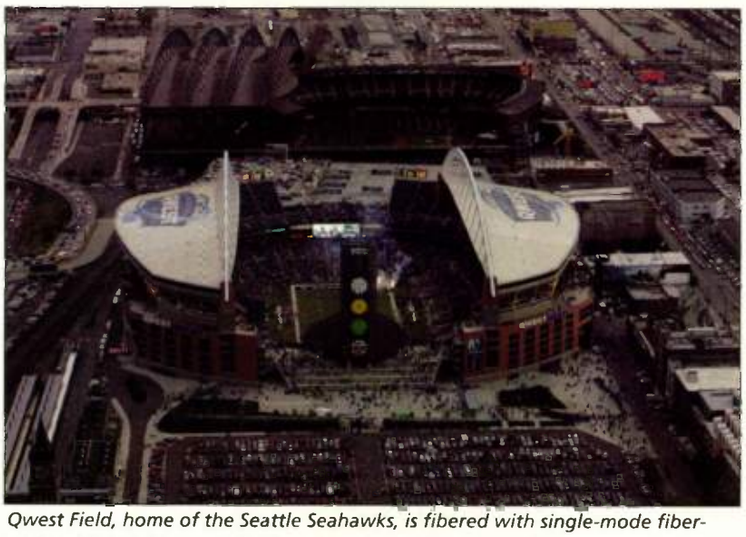
Kallander said they also had to put all equipment and services out to bid, including materials, such as fiber cable. (Gepco won the bid to provide fiber cable).

MIXING NEW WITH OLD

For CBS, Kallander also managed the upgrade of cabling infrastructure at Dolphin Stadium, in Miami Gardens, Fla., an AFC stadium hosting the Miami Dolphins (NFL) and Florida Marlins (MLB) that is being extensively renovated.

"In a newly built stadium, you can work with the architects to have them allocate 'fiber trays' and conduits enabling you to run adequate fiber safe-ly and neatly," Kallander said.

"But since Dolphin Stadium is an older building, the existing cable tray was a horrific mish-mosh from years during which people yanked and pulled cables through for telephone, data, security, and broadcast purposes. This crowded conduit was woefully inadequate to meet the HDTV needs of the upcoming Super Bowl at Dolphin Stadium in January 2007. We decided to leave that cabling in place, and start over with a new parallel tray and conduit geared to cabling the greater number of camera positions required by today's NFL telecasts."



Qwest Field, home of the Seattle Seahawks, is fibered with single-mode fiber-optic cable to all camera, field, and announce booth locations.

At Dolphin, Kallander worked closely with Scott Nardelli, director of fiber-optic solutions for Bexel Broadcast Services in Burbank, Calif. Bexel provided the installation equipment and handled the physical installation, according to Nardelli; however, the stadium owner bought and installed the cable trays, and the new copper and fiber-optic cable was paid for by CBS.

"The practice of abandoning older cable and trays is done for several reasons: it's time-consuming and difficult to identify cables and what they relate to; and mixing new cables with old can be confusing and potentially damaging to existing cables," Nardelli said.

He added that at Dolphin, the legacy cable is still used regularly for telecasts of the Marlins games.

"In today's HD world, there's zero tolerance for error," Nardelli said. "For CBS, the technical advantage and confidence in their cable plant outweighed the risks associated with a dated infrastructure."

UNIQUE DESIGN

Nardelli also designed a unique, complex fiber installation for Comcast SportsNet, a cable sports network in Philadelphia that televises 76ers basketball and Flyers hockey from the Wachovia Center, as well as Phillies baseball games at nearby Citizens Bank Park.

"Comcast wanted to connect their HDTV studio control room to the Wachovia Center arena as well as to Citizens Bank Park so they could transmit 1080i HDTV signals from roughly 18 cameras without a truck at each stadium," Nardelli said. "Our solution allowed them to set up the cameras and patch them in, and then control everything from their studio a mile away."

The fiber-optic cable selected complied with the SMPTE 311M standard, and carries camera signals, on-air intercoms, and other data via four copper wires and one single-mode fiber. The installed SMPTE 311M cables provide power and communications over the entire system.

MAKING CONNECTIONS

A typical SMPTE cable runs 5,500 feet max. But the Wachovia to Citizens run exceeded 7,800 feet, making it necessary to upsize the wire gauge to 16 and 20 awg to accommodate the voltage drop, according to Nardelli. "Connecting the facilities involved tearing up streets in downtown Philly and months of planning," he said.

This installation also involved fiber connectors for camera-stadium, stadium-truck, and truck-truck interface, which presented yet another new challenge. Expanded beam connectors from Stratos Optical Technologies is a solution that Bexel employs because it provides conformance to the SMPTE standard, reliability, and easy user-interface.

"The hermetic seal on the connector shells ensures they keep performing when dropped in dirt, mud, or standing water," said Bill Hollis, video product manager for North America for Stratos Optical Technologies in Chicago. "Also, cable rigging becomes easier because expanded beam connectors are hermaphroditic—meaning no need to match male and female ends."

BIG TRUCK TREND

Hollis pointed out that there is a

STADIUMS, PAGE 19

World Radio History

"Sony was the only supplier to step up to the plate."

— Jason Taubman and Paul Bonar, Game Creek Video

HDemanding

Jason Taubman, VP of design for mobile production company Game Creek Video, faced contradictory demands. He tells us, "Some clients required the highest quality in 1080i and others demanded the same in 720p. Some venues only had fiber and some strictly triax. Sony was the only supplier to meet all these requirements in a single camera."

"We committed to the HDC-1500, Sony's 1080/60p camera before it was even a model number," says Paul Bonar, VP of engineering. "And Sony committed to us. Their engineers heard our input on the large lens 'slec,' which works like a charm. We gave them distressed cable to help design the triax adaptor, which is brilliant. And in service and support, Sony has risen to every challenge and met every need. We're now on our fifth consecutive truck with the HDC-1500, the best HD camera we've ever seen."

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World Radio History

The Return of PC-to-TV?

DirecTV hopes to bring photos, music, online movies to the big (TV) screen

by John Merli

EL SEGUNDO, CALIF.

The typical distance between the home computer and the TV screen is usually within shouting distance of each other, but both appliances have been mostly lost in translation until now. Recent developments illustrate that a PC-to-TV environment could now start to happen in two separate scenarios in coming weeks.

Under one scenario, there may be less here than meets the eye. Literally. DirecTV is matching up its new Plus HD DVR box with Viiv technology-equipped computers from Intel to permit some PC content to be viewed on larger TV screens, where TV is meant to be seen. Yet while this represents an early marriage between the PC and TV, the honeymoon will start off with some major ground rules on available broadcast, cable and movie content by DirecTV itself (or more precisely, the lack, thereof).

VIIV

DirecTV's Viiv-friendly DVR box, set to become available to subscribers later this fall, boasts a hard drive storage of 200 hours of SD content or 50 hours of MPEG-4 HD, and will function as a typical DVR record-and-playback device.

Intel also is working separately with a variety of content providers to legally tap additional online material for Viiv PC users, and has inked deals with AOL, Yahoo! and NBC Universal for most of its primetime broadcast series (dubbed "VIP Access"), among others. But this additional content likely will not be allowed to be streamed to large-screen TV sets via the DirecTV Plus HD DVR. (Most of this content is being repurposed by other parties, too, for Centrino laptops and smaller, BlackBerry-type devices).

Intel spokeswoman Kari Aakre said achieving a PC-to-TV flow using the DirecTV Plus box is relatively simple and "certainly does not take an engineer to set up." Besides the TV itself, she said it basically requires a Viiv PC and DirecTV box, which will be certified for Viiv technology and include built-in digital media adaptor (DMA) functionality for sharing data stored on a computer's hard drive.

"Consumers should not be required to make sure they have a whole list of components in order to be able to make this connection," Aakre said. "This [DMA] capability will be deployed to DirecTV customers easily and virtually overnight, thanks to an [Internet] software download beginning in December."

The DirecTV Plus HD DVR

Romulo Pontual, DirecTV's chief technology officer, said the DirecTV Plus HD DVR was designed specifically to connect to home networks. "The box will be compatible with several routers used in a home environment." (Netgear is making most of the applicable router units until late this fall).

DirecTV apparently will exclude pass-thru of highly desirable downloaded TV series and motion picture content from Viiv PCs using its Plus DVR box, at least initially, because the DBS firm reportedly is concerned about the possible adverse effect such content could have on its own VOD plans. Without directly acknowledging such concerns, Pontual said "we're not disclosing our service plans." DirecTV plans to begin its own VOD service using the same HD Plus DVR box sometime in 2007.

WELL-GUARDED SECRET

For its part, Intel has had a few problems in its early marketing of Viiv technology. Some industry analysts, including Gartner Research and the Enderle Group, have observed in published reports that Intel has failed to make clear to enough consumers why they should want Viiv PCs and, subsequently, has managed to keep the technology a sort of well-guarded secret. (It's been available in North America for most of calendar year 2006.)

"We're just not sure there's much of a demand from consumers," said Bruce Leichtman, president of Leichtman Research Group. "Everyone is for innovation, but people generally are used to using their PC for certain things and the TV set for other things. Creating a Reese's Pieces from chocolate and peanuts is not something that everybody wants."

As for more typical online video content such as brief movie trailers, news snippets and music videos, Leichtman contends "there may be a reason why this content is on the PC in the first place. It's mostly [short-form] content and maybe it's best-suited for the PC environment, not the TV set."

Intel's Aakre counters that Viiv enables a broadening of consumer choice over when and where they want to experience more content and services. She said a variety of brand-name PCs are being offered at the retail level with the Viiv logo displayed on the applicable PCs and laptops. (As a matter of policy, she said, Intel will not disclose how many Viiv PCs have been sold since the technology was first introduced last January at CES.)

A second device that appears to hold more immediate promise for transferring a wider array of content from PC-to-TV will soon surface from Apple. Company CEO Steve Jobs teased reporters earlier this fall with a brief preview of what's coming.

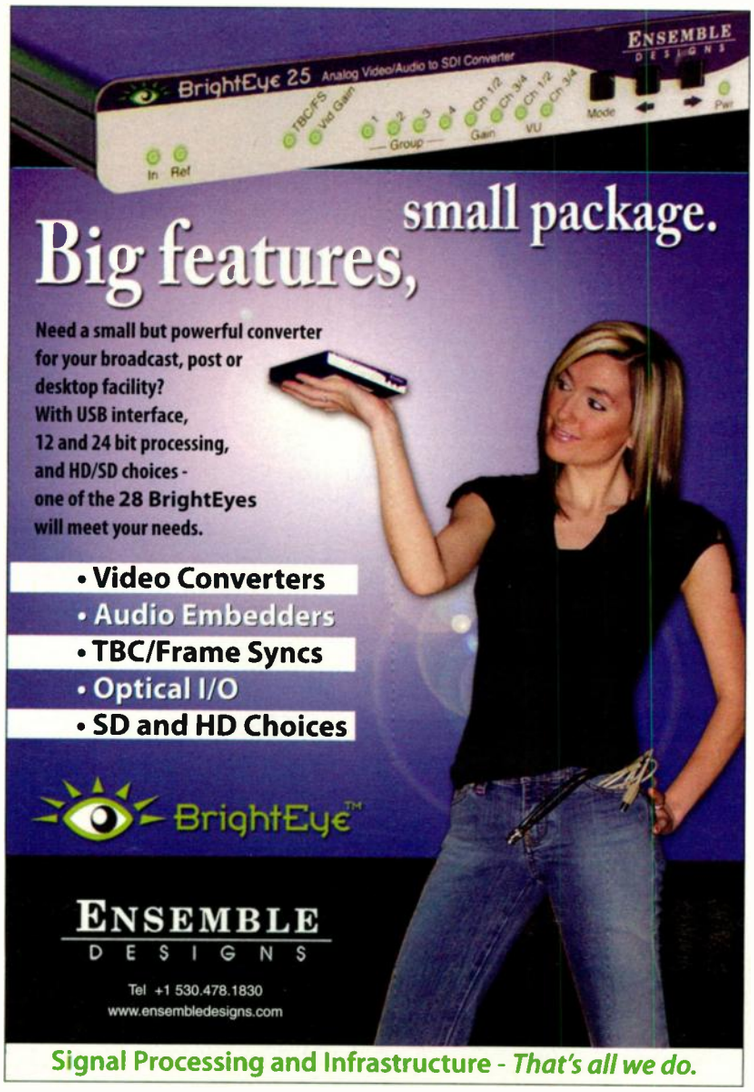
Code-named "iTV" (which will not be its final moniker), the Apple set-top unit will allow a customer to its busy iTunes online store to purchase and download movies, TV shows and other entertainment to his or her computer hard drive, and then wirelessly relay the content to the larger-screen TV set.

Movie content, however, is expected to be limited to perhaps a few hundred titles in Apple's initial ramp-up next spring. (By comparison, Netflix's DVD rental service boasts about 65,000 titles.)

According to the few details available, the wireless Apple iTV will feature an internal power supply, component video and analog audio, USB 2.0, Ethernet, one HDMI plug, and software that will enable 3-D animated graphics. Jobs said his firm expects to offer the device for about $300.

Leichtman doesn't see much tangible proof yet that the demand is there for such in-home, content transfer devices, including Apple's. "What I said a decade ago when they first streamed the Victoria's Secret catalog online was that if it became a major event, which it did, it would end up on [traditional] television as a TV show, which it also did for awhile."

Victoria's Secret or not, whether early PC-to-TV devices prove sexy enough for mass acceptance could become apparent within the next 18 months. ■



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Stadiums

CONTINUED FROM PAGE 16

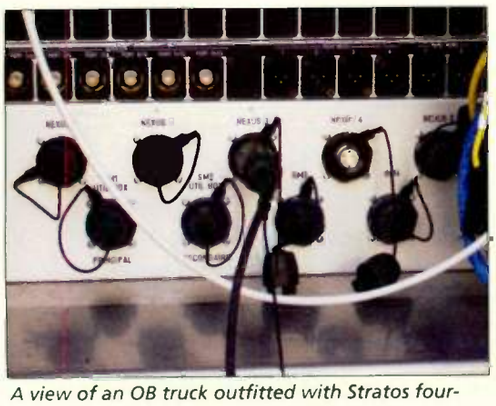
growing trend to connect truck fleets at stadiums with fiber cable, such as "single-mode tactical fiber" containing 12 strands of glass, so that the main truck can share the signal with the graphics, audio, and other B trucks in the fleet, as well as provide pool feeds.

"When trucks use copper cable, the video signal can be adversely affected by EMI [electromagnetic interference] as well as RF interference, and ground loops, among other things. But with fiber cable, you are using light and glass to transmit the data which is impervious to such problems so the signal remains clean and pristine, and doesn't introduce anomalies into the signal as it moves from truck to truck," Hollis said.

At Seattle-based Qwest Field, home of the Seahawks, Kurt Shaffer, director of technology said that the entire stadium is fibered with single-mode fiber-optic cable to all camera, field, and announce booth locations.

CABLE "HOME RUNS"

"We have what we call 'JBTs' or junction box television hook-up panels that 'home run' to the truck compound I/O racks," Shaffer said. Homerun is simply a direct point to point with no patch, equipment, or splice in the path. "There are six racks at this location consisting of one for telco and transmission, four for connecting to the JBTs and one for connection to the house left to right respectively."



A view of an OB truck outfitted with Stratos four-channel expanded beam fibers connectors for stadium-to-truck interface.

Qwest Field, a relatively new stadium owned by Microsoft Co-founder Paul Allen, was designed as a "specific use" stadium specializing in football.

"Because of this, we can provide a specific pathway for that specific function. All camera stations have fiber, but the location of the 'camera wells' were done with football in mind," Shaffer said.

Crews prepare to install custom SMPTE fiber-optic cables under Pattison Ave. in Philadelphia, connecting the Wachovia Center to the new Phillies Park.

In addition, Qwest Field spent considerable sums of money trying to future proof the stadium by installing plenty of fiber that currently remains dark.

Most new stadiums "may leave provisions for this but won't actually put the fiber in as money is typically put in 'front of house' amenities that the public will see," Shaffer said. "We have a very forward-thinking owner that allowed us to do this."

GETTING PLUGGED IN

At the University of Phoenix Stadium, formerly known as Cardinals Stadium, in Glendale, Ariz., Senior Technology Director Mark Feller said that broadcasters bring their trucks up to the truck dock where the TV panel is, and just plug into the circuits.

"At the TV panel, the broadcast truck producing the telecast can plug into all stadium connections, including the cameras and the stadium game clock," Feller said. "The TV panel is on the outside wall of the stadium behind a roll-up garage door, and it measures 20-feet wide, and contains six seven-foot racks for all the inputs they need for the show."

Besides a roof that slides open and closed, the University of Phoenix Stadium is unique in that the playing field can be rolled outside so that the grass can grow in sunshine. And Feller said the concrete floor underneath is a better surface for staging exhibitions, trade shows, and other events that doesn't harm the grass.

University of Phoenix Stadium will be hosting the 2008 Super Bowl, and Feller said they are already assessing what further capabilities will be needed by broadcasters for that Super Bowl telecast.

"Once we see what they need at Super Bowl 2007 in Miami," Feller said, "that'll serve as a blueprint for whatever capabilities we'll need to provide here." ■

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GooTube

CONTINUED FROM PAGE 1

Demand (VOD), which is rapidly being introduced in the cable environment and explored for delivery via the "extra" channels of digital TV multicasting.

Internet VOD is available right now, including the frustratingly slow movie services (often because of download time) such as CinemaNow, MovieLink and Vongo. As viewers' tastes for VOD evolve, more Internet video may compete with services from cable or broadcast multicast operators.

Another competitive element is Consumer-Generated Media (CGM)—also known as user-created content—which is supposedly at the core of YouTube's appeal. Although the novelty may be fleeting, the role of a global video-making community has bounced through media companies for 30 years, since the earliest days of cable TV "public access" channels. The technical improvements in home video cameras and editing equipment have fast-tracked this sector, especially as a video-savvy generation came of age with the near-professional quality, affordable digital video tools.

The GooTube deal also raises the prospect for more video-mash-ups, the blending of Web and video content into derivative products. Today, many mash-ups online bring together elements such as Google's maps and aerial photography with listings information, such as musical performances or special interest group activities. Adding homemade video to such a service—and making it searchable, which is Google's strength—offers further creative outlets.

Broadcasters could plug into that mash-up process, using their own production capabilities or viewer-contributed content to localize newscasts or other reports. Multicasting of locally "zoned" segments enables broadcast stations to bring some of this capability to their airwaves.

Similarly, another form of CGM is "citizen journalism." Viewers are encouraged to submit homemade video to local broadcasters: content as diverse as tornado and hurricane footage to "nanny-cam" images has reached local airwaves. The year-old Current cable TV network (headed by former Vice President Al Gore) also includes heavy doses of viewer-created content, some of it funded by Current's thrifty underwriting.

GooTube is likely to encourage more such citizen journalism and other CGM, possibly opening the door for collaboration with TV stations that can cross-promote and run such content.

Since "search" is Google's fundamental building block, this core strength is likely to manifest itself in new ways with the YouTube alliance. New tools, including face and pattern recognition, music or soundtrack (dialogue) recognition or as-yet unimagined search capabilities might become part of the package. Such features would enable viewers to hunt for specific video segments with visual tools rather than text searching.

REVENGE OF THE MTV ATTENTION SPAN

YouTube, like other Internet video services, has demonstrated that short-form TV is increasingly the wave of the present. In the 25 years since MTV began indoctrinating a generation of viewers that three-minute segments constitute an appropriate TV experience, television production has increasingly catered to the short attention span. Producers may cringe when their half-hour or hour-long episodes of TV series are condensed to 120-second video clips for online and wireless transmission. But some audiences seem satisfied with those brief highlights.

Recent contradictory studies offer differing views about the appeal of mobile video on a two-inch screen. Nonetheless, decades of channel surfing and segment-hopping have bred a vast audience viewers who can "stay tuned" for only about three to four minutes at a time. YouTube along with MySpace Video, AOL Video, Grouper and dozes of other online video sites underscore the appeal of short-form content.

Broadcasters—historically chained to 30- and 60-minute program grids—may find it necessary to alter their timing or rely on viewers' use of home digital video recorders to do the shifting for themselves.

YouTube's recent deals with TV networks and studios may also be a two-edged sword. While they allow broadcast content to reach beyond the traditional distribution channels, the arrangement also enables to YouTube (and now its parent Google) to become a "sixth network," one which can commission and distribute its own programs.

Hence, the current collaboration relationships may quickly morph into a competitive situation.

If that process evolves, local TV affiliates may be in an even more precarious position. With their networks streaming shows on their own (such as CBS' InnerTube and Disney's ABC.com) plus shows and segments available via Google or other online portal, local stations will confront new challenges to create engaging local content for their broadcasts, including digital multicast channels.

One consistent question about GooTube is monetization. Since YouTube, which has relied so far on limited on-screen advertising, has yet to turn a profit, how will the new venture generate revenues? For broadcasters, the bigger question is whether customized or localized GooTube content may compete for advertising dollars.

Some analysts suggest that smaller advertisers, who cannot afford broadcast commercials, may drift toward online services, where they can more carefully target viewers. Others continue to see cross-platform campaigns as an idea connection—with short TV spots pointing viewers toward transactional Web sites with extended video product demonstrations and ordering capabilities.

In a similar vein, many media executives express concern that GooTube is Google's stepping stone toward becoming a full-fledged media empire, including launch of a TV network. Gossip about "Google TV" has flourished for a couple years, especially among "branding" experts who believe the online brand can reach into other media.

In the days after the YouTube purchase, Google CEO Eric Schmidt reportedly visited CBS, Viacom, Time Warner and other media behemoths to assure them that Google has no plans to enter the content business itself.

ADDITIVE AND ADDICTIVE

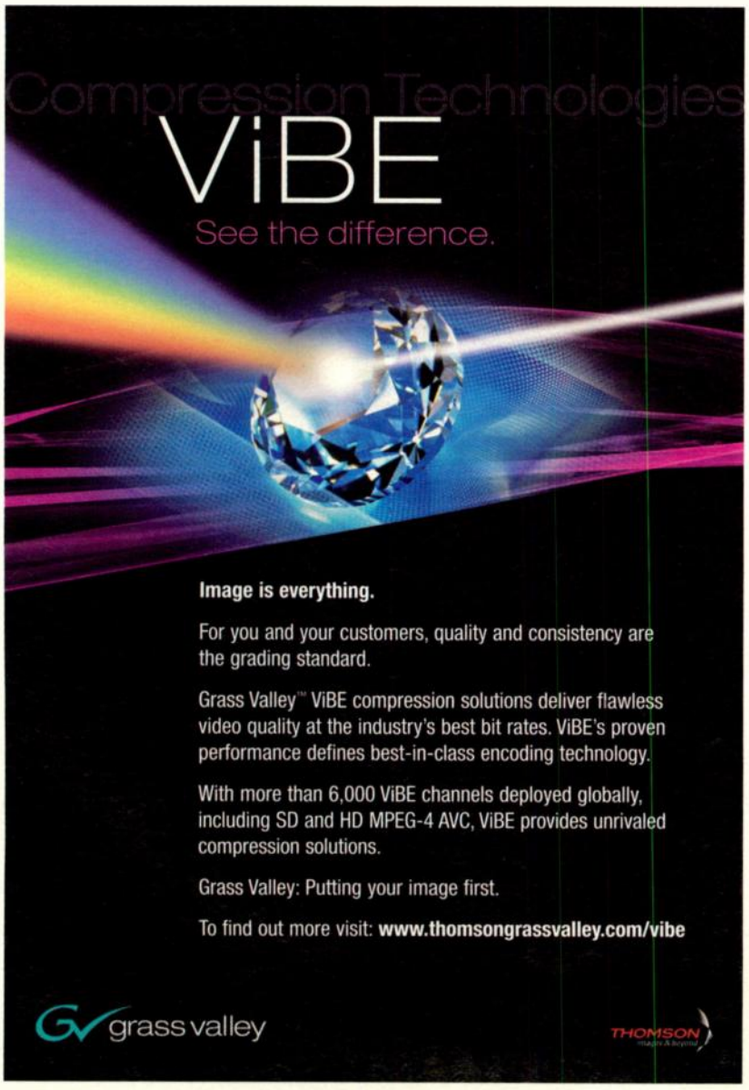
The content issue raises another major stumbling block that erupted when the GooTube alliance sprung forth. Critics, including media maverick Mark Cuban (who enriched himself when he sold his start-up Broadcast.com to Yahoo! during an earlier wave of online video frenzy), charged that YouTube's copyright violation problems are insurmountable. Much of YouTube's most popular content includes clips sliced from broadcast programming (such as "Saturday Night Live" or "Comedy Central" segments).

Supporters believe that such copyright violations can be controlled, usually through technology—but possibly via licensing—arrangements.

More perplexing and challenging for broadcasters as well as new media mavens is the audience diversion factor. Broadcast proselytizers point to data that suggests viewers are tuning in to more television; they cite Nielsen Media Research's recent report that the average U.S. household watched TV for eight hours and 14 minutes daily during the 2005-06 season, up three minutes from the previous year. Nielsen's data also indicated that young viewers—supposedly the target for new media services such as GooTube—were watching more TV shows.

Such findings suggest that TV viewing and Web usage are additive: viewers, including multitaskers, are finding more time each day to search multiple media systems. At the same time, the addictive—and viral—nature of Web video raises even more questions about future video consumption patterns.

GooTube's role in that future will continue to be watched by broadcasters.■



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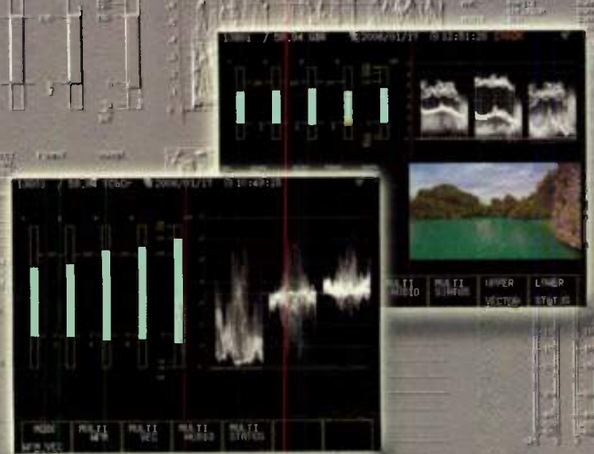

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Not Just For Listings Anymore

TV Guide Channel prepares studio for HD

by Sanjay Talwani

HOLLYWOOD

TV Guide Channel—the one with the scrolling program guide below gossipy talk shows—has upgraded its facility to enable high-definition production, signaling the channel's move away from its barker status into something people might want to watch for the programs.

"Over the past 18 months, TV Guide Channel has evolved from being a utility service for TV listings to a full-fledged cable network with more than 14 hours of original entertainment programming premiering each week," said Jack Carey, executive vice president of Operations at TV Guide Channel. "The long-term goal is to start acquiring materials in HD and taping the programming in HD. This will allow TV Guide Channel to be ready for the industry transition to high- definition."

TO THE NEXT STEP

Taking its technical capacity to the next step at its facility in the new Kodak theater complex on Hollywood and Highland, TV Guide Channel procured Sony HD cameras and switcher and Grass Valley router.

TV Guide Channel is, after all, a channel watched mainly by people looking for something else to watch, so its "programs" promote and highlight the endless content available on the other 76 or so channels on a system. The shows, in keeping with the times and with the attention capacity of those who view them, are fast-paced and very current, generally taped the same day they air.

A view of TV Guide's new studio camera control, installed by TV Magic.

TV Guide Channel combines its original programming with program data for some 27,000 locations. Programs include titles like "TV Watercooler," "Watch This," and the channel's signature offering, "The 411." The mother-daughter team of Joan and Melissa Rivers appear on numerous TV Guide Channel programs and red-carpet events, and the network claims its correspondents interview some 3,000 celebrities a year.

The studio launched in September 2004 with rented gear and engineering services from Sweetwater Video, according to Carey. The channel decided to purchase the studio equipment enabling it to record line cuts in its daily and weekly programming in the most efficient manner. It hired 11-year-old TV Magic, with its own brand-new Burbank office, to realize its vision, reviewing TV Guide Channel's designs and switching out the rented gear.

The TV Guide Channel project is the first for the systems integrator's Los Angeles branch.

"In the longer term they needed to own their own gear and they needed to kind of assure themselves of a technical longevity, and that's when they decided to begin to search for major components that they believed in," said Frank Geraty, manager of TV Magic Los Angeles. "And that would be the Sony production chain with respect to camera and switcher and the Grass Valley routing system for its flexibility, the Evertz modular product for its quality, and also the assistance Evertz gave them."

TV Guide Channel purchased studio gear that has been proven by the industry. "With the tight production schedules, there is not the time for failures or training, so we selected the most reliable partners for our build-out," Geraty said.

The core of the plant is the Thomson/Grass Valley Group 64x64 Concerto HD/SD router with a 128x128 analog audio router, using Encore control. Signals are processed with the Evertz 500 DCDA-HD Video D-A, and HD up- and down-converters. Leader scopes and Wohler audio monitors keep tabs on the signals.

The control room features the Sony 2.5 ME MVS-8000 switcher. It is HD and SD capable, switchable among formats, frame-rates and aspect ratios. The facility has Sony BVM QC and line monitors and smaller Ikegami source monitors.

The sound booth centers on the Yamaha PM5D audio console with Ward Beck audio D-As. Recording gear includes DigiBeta 2000 tape machines, an EVS "Elvis" DDR, and 360 Systems Instant Replay and DigiCart systems, with a Tascam CD player with Cedar Audio noise reduction. The channel's live-to-tape shows are produced here and edited at seven Final Cut Pro bays upstairs.

NO DOWNTIME ALLOWED

TV Magic had to work around the studio's production schedule without missing any production time. "When you're doing a cutover and the existing operational facility can be compared to any broadcast or production facility, you've got to keep working," Geraty said. "You can't just stop because you want to upgrade. So Evertz came in with an awful lot of loaner gear and they were very helpful and obviously the product speaks for itself."

The equipment was evaluated during the first quarter of 2006 with most purchases happening in February and March, said Carey. TV Guide Channel and TV Magic first started discussing the project in March and finalized the details in May. TV Magic managed to work around the existing studio production schedule and had the facility operational for August 1, with a cutover July 31.

"A lot of people do that—instead of going directly to a systems integrator to manage all of the design, they will go ahead and take a shot at it, and when they get to the point where it's time for help that's a lot of times when we'll come in and do the mop up," said Geraty.

"We had to cutover some subsystems, like a new Reidel Artist MFR-64 intercom, over a single dark day with the TV Guide engineering staff," said Kevin Bohn, TV Magic engineer and project manager on the TV Guide project.

"They had to have it done on such a fast timeline. It was a real race to the finish for sure," said Geraty. "And the beauty of course is that it actually happened." ■

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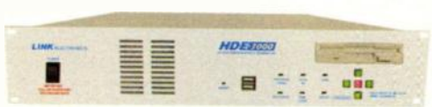

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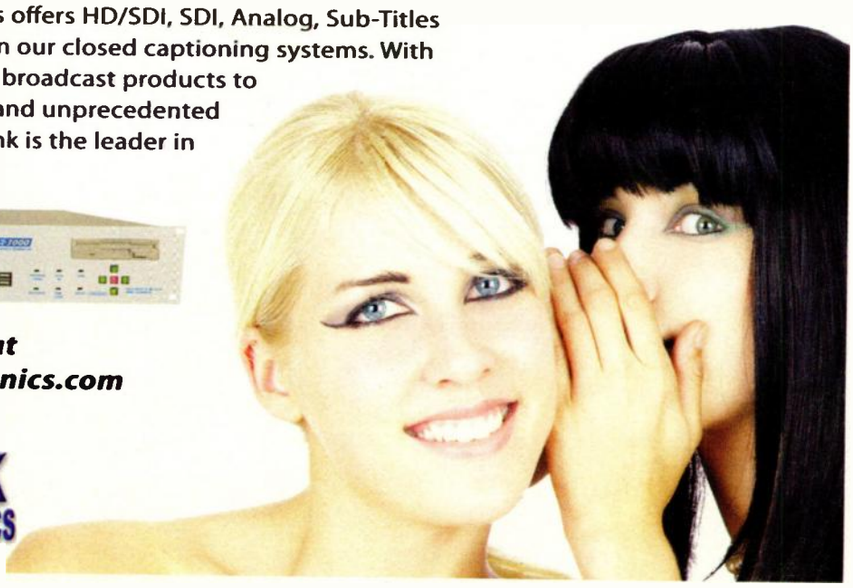

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A-VSB

CONTINUED FROM PAGE 12

transmitters, a Rohde & Schwarz 5 kW NV5400. The transmitter's exciter was replaced with the A-VSB prototype. Samsung provided the A-VSB prototype receiver and omnidirectional and monopole antennas.

"An A-VSB receiver was mounted in a van that was driven all over the coverage area of the station at speeds in excess of 60 miles per hour. Simple antennas were used for reception in the vehicle," Ostroff said. "Reception was virtually perfect."

John Godfrey, vice president of government and public affairs for Samsung Information Systems America said his company conducted separate tests with omnidirectional antennas on a van roof and monopoles inside a van.

"The omnidirectional antennas performed better because they were outside the van... and are better antennas, but both types of antennas worked," he said. "We tested both single- and dual-antenna performance. The reason for using pairs of antennas is that two antennas spacially separated are better than one—you get 'diversity' in reception, for a modest 3dB signal-to-noise improvement."

If the A-VSB enhancement is adopted, greenlighting mobile services, Ostroff believes broadcasters' major investment will be in creating content and promoting the new services. He thought technology costs would be relatively small.

"The cost of modifying your television transmitter to transmit A-VSB is practically nothing in the larger scheme of things," he said.

Single-frequency repeaters needed for the network aren't on the drawing board yet, but Ostroff believed the small, solid-state, low power, 5 W kind would do.

"If you've got a million dollar investment in a transmitter, and somebody said, 'for another $100,000 you can put 10 repeaters around the marketplace to enable this business model,' to me it would be a no-brainer," he said.

Ostroff envisioned two types of business models for mobile services: National services offered by aggregators like QualComm and Verizon and, on-demand, community-oriented programming, video and data from local broadcasters to receivers that have memory.

"There's no reason why a car sitting in your garage could not receive whatever you're interested in—movie listings, news, updates, traffic—so the next morning, it's delivered by the broadcaster to the car by broadband," Ostroff said. "We could sell our spectrum to automobile dealers and manufacturers—what makes us different from the QualComms and Verizons is that we're local."

He estimated acceptance in "several years," though, he said, if the American public latched on to it like they took to iPods, mobile services "could take off like a rocket."

CURRENT REALITY

ATSC President Mark Richer says the current work plan calls for a working draft of the standard to be completed sometime in the spring and that A-VSB "could be elevated to candidate standard sometime in early summer.

"A number of companies are involved in the analysis work," said Richer, declining elaboration. At press time, he said there were "no other technologies under formal consideration for enhanced transmission."

A-VSB is under consideration by the specialist group on transmission (TSG/S9). Rohde & Schwarz's Smith said he was on the TSG/S9 committee for three years when he read about Samsung's SRS technology. The two companies joined forces about a year and a half ago, Smith said.

Testing plans were devised by a TSG/S9 ad hoc group, S9-5, chaired by Victor Tawil, senior vice president of the Association for Maximum Service Television. Test costs were picked up by the proponents. ■

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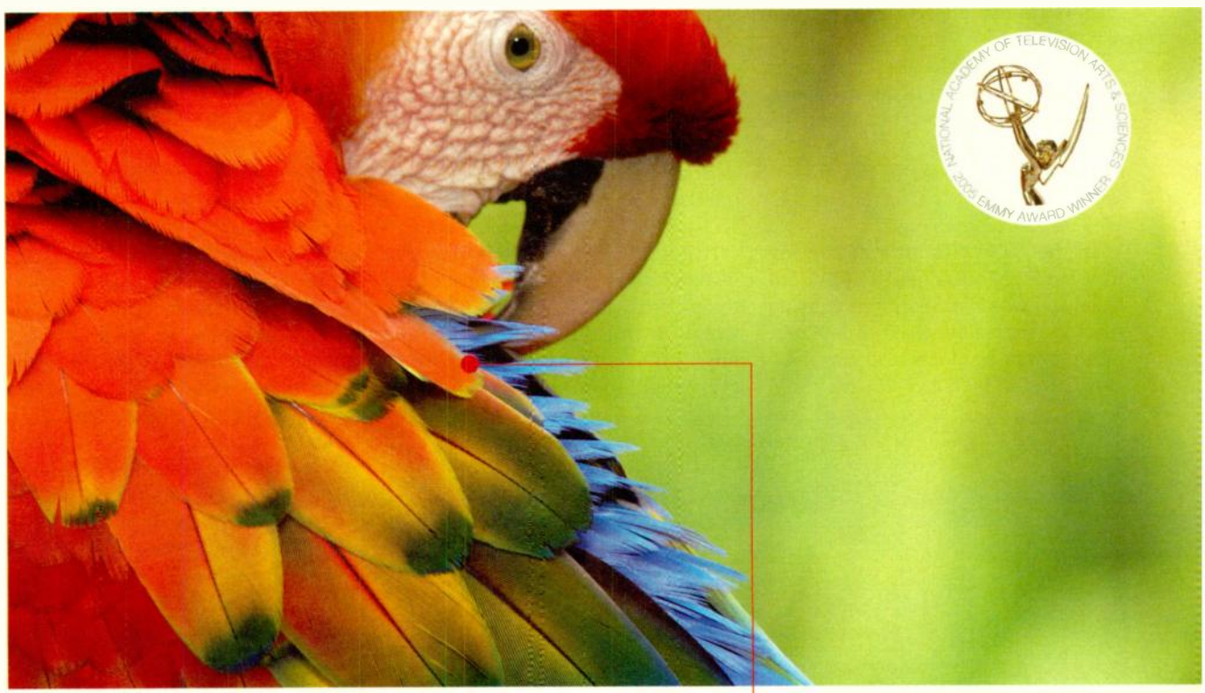

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World Radio History

SD to HD: The Evolution of the Species

Sooner or later, prices and technology make it inevitable

by Paul Crouch Jr.

COSTA MESA, CALIF.

Having literally grown up in and around TV and film studios in the '60s and '70s (that dates me just a bit) I have been witness to some pretty awesome innovations and evolutions in both industries. Some of my earliest recollections are of huge lights and massive camera dollies rolling around my father's film studio in Burbank, Calif. (He did missionary films for the Assemblies of God.) It doesn't take a genius to realize or recognize the changes that have taken place over the last 40 years. And it seems like innovation and transformation has only quickened the last 10 years or so.

In the 1950s, (a little before my time) television transitioned from black and white to color. It took many years for the whole chain to be complete... from production to transmission (this is well before the cable industry even existed), to people finally buying these new-fangled color TV sets in the home.

Many incredible technical hurdles had to be overcome for this new television standard to work, but it did happen, the glitches and shortcomings were dealt with, and the technology does work... and works well.

LEARNING CURVE

We are currently smack dab in the middle of the next great technical evolution in the broadcast and television world. Going from standard definition to high definition will encompass a very steep learning curve much like what took place in the '50s.

Back then, producers were having to deal with things like make-up changes for your talent, adding color to set design, the differences in lighting and contrast ratios, registering a three-tube color camera (which was a science in and of itself), matching the colors on multiple cameras, etc. All of this was addressed and technology marched on.

I remember at the NAB convention in 1986, I saw the first analog version of what would now become our digital 1080i or 720p hi-def universe.

Sony demonstrated a 1,250-line interlaced camera and monitor, with a reel-to-reel VTR the size of a small refrigerator. I remember that the images I saw were stunning compared to our "tried-and-true" NTSC 525 line world! At that time the salesman told me, "high definition would be in everyone's home in five years!" My first reaction was one of natural skepticism, but heck, he's a salesman, what do you expect?

Obviously it's taken a bit longer for HD to really become commercially viable in this country, but as I mentioned earlier, "we're right in the middle of the revolution, or more accurately, "evolution."

For us at the Trinity Broadcasting Network, we have more than 35 studios and production facilities that will eventually need to be converted, but as the old saying goes, "How do you eat an elephant? One bite at a time!"

TBN's HD set up in its Costa Mesa, Calif. studios

We began the HD upgrade process at our headquarters studio in Costa Mesa, Calif. early in 2005. This was an older six-camera SD analog facility built in 1997 and much of the gear was dying, with no spare parts available.

So when we made the decision to not just overhaul the plant, we had actually reached the delta curve where HD cameras, switchers, monitors etc., were only marginally more expensive than SD. So the decision was made to "Go."

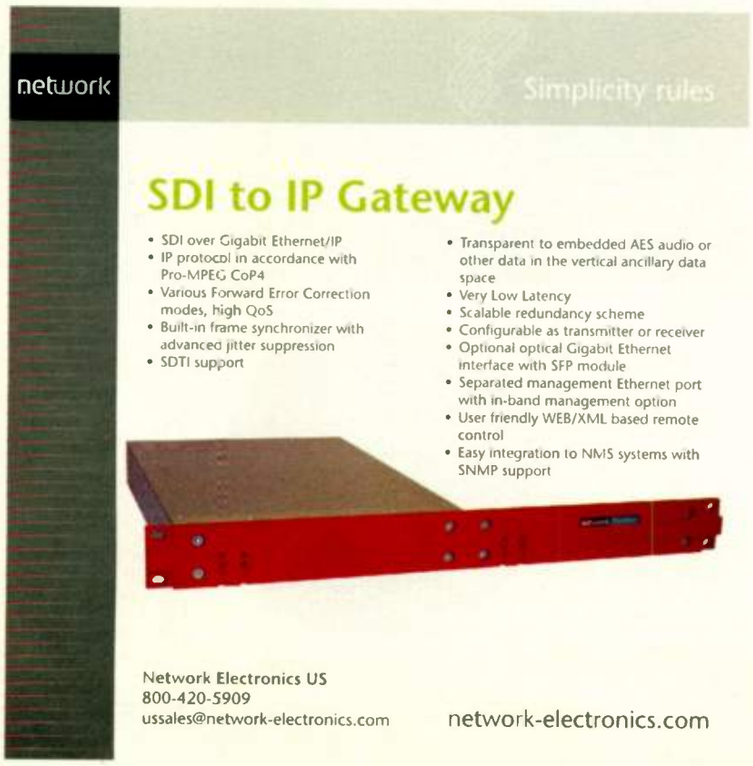
On the camera side, we replaced our standard definition Ikegami HL-45s with the high definition Grass Valley LDK-4000s.One of the major reasons for this decision was the fact that our studio complex had more than 30 triax camera runs already installed and in place. Out of one control room we could shoot in two different studios: a 300-seat conference room, or outdoors in a large plaza that surrounds the building. Most of the camera manufacturers wanted us to re-cable the whole facility with newer "fiber cabling," but Grass Valley didn't care; you ordered the units either way. Apparently, there is a slight advantage in the cameras' signal-to-noise ratio if fiber cable is used, but in our real-world tests and evaluations, we found these advantages negligible.

The LDK4000 also offered a price point advantage that made a lot of sense for our network. The first camera we looked at from Grass Valley was the LDK6000 "World Cam." Switchable from 480i, 480p, 720p to 1080i—in addition to a variety of frame rates, (i.e. 24, 25, 30, etc.)—this unit can truly be, "all things to all people."

But trust me, you pay for that advantage. In a rental environment this could provide awesome cost savings, but we had decided early on that 1080i was going to be our one and only format moving forward. 1080i is emerging as a much more popular "world standard," and we want our next generation of content to be as universally adaptable as possible. With the LDK4000 you pick ahead of time which standard is required and they manufacture it to those specs. This provided a $20,000 savings per camera or $120,000 in the overall budget.

Our next decision focused on lenses All of the major players offer a wide variety of choices. (Canon, Fujinon and Thales Angenieux.) The good news was that since 1997, the lenses were simply both wider and longer, but not necessarily less expensive!

We eventually went with Canon because of track record and service support. They have excelled at both with us over the years. Because our studio is fairly limited in size we had to go with the smaller ENG style units. Larger box lenses do offer some advantages, (faster *f*-stop, more control choices, longer zoom ratios, shot boxes, etc.) but none of those were critical. For the pedestal cameras we chose the HJ22ex7.6B IRSE/IASE lenses, and for the jib and hand held cameras we went with the HJ11ex4.7B IRSE/IASE wide-angle units. All have performed as expected and we even added the electronic servo focus control in addition to the already included zoom control. Focus is very critical in HD and the electronic servo precision motor works extremely well.



World Radio History

LIGHTING

Another consideration in HD is with sets and lighting. We completely blew up our old set and replaced it with something new and more contemporary. While much of this is simply a creative choice, we also took into consideration the newer, wider, 16:9 aspect ratio, plus the quality and detail of what we put into our design and construction.

Remember, HD cameras have four times the resolving power of SD, so even the slightest imperfections in the backdrops, walls, furniture, etc. will show up. We included additional shoot-off areas on the left and right, to make sure the camera operators were covered when framing.

For lighting, we found that HD is much closer to "what-you-see-is-what-you-get." Having been a director of photography for 25 years, I loved the creative latitude the cameras gave. We are lighting our talent at no more than 60- to 80-foot-candles and the contrast ratios are awesome. We are still pushing the envelope and learning more everyday. What looks good and what doesn't is a journey, not a destination and I expect that this will be an ongoing process for years to come... at least I hope so!

AUDIO

One of the steepest learning curves for us was in the area of audio. The SMPTE standard for HD video is Dolby 5.1 surround sound. Our old audio world had to be completely replaced and we chose the SSL C-200 console. This was actually the most expensive single piece of equipment in the whole conversion.

With this board we can still do a basic stereo mix that is recorded on the linear tracks of our Panasonic DVC PRO-100 tape machines. We then send the Dolby 5.1 mix to the recorders as "embedded" audio to be used later when we actually start broadcasting the HD signal. We also invested in a very large wireless world with both lavs and hand mics.

This was an added convenience for our talent, plus we didn't have to deal with audio cables running across the back of the set.

Again, what you could hide in an SD world is a lot tougher in the HD environment.

Graphics and lower third supers are another concern is HD. While we are shooting everything in the 16:9 aspect ratio, that doesn't mean that your audience will necessarily be watching it that way.

All of the graphics we create are still designed for the 4:3 aspect ratio, but we protect the 16:9, meaning all of the pertinent information is limited to the middle of the screen, but we add window dressing to fill in the sides for those viewers who actually see the wider aspect ratio.

So far, the learning curve with this new facility has been steep, especially on the engineering side, but not as painful as one might expect on the production side. Working in HD is a process and as with anything, the longer you do it, the better you get. Content is still king, and the technology of how we record and distribute this content evolves all the time. (And will continue to evolve forever.)

I walked into the room of my 12-year-old daughter the other day and saw that she was watching "I Love Lucy", in black and white nonetheless! (Imagine the outdated technology that was used in creating that program.) I asked her, "why she was watching that particular show?"

Without even looking up or being concerned one bit with how it was produced, filmed, edited, dubbed, sweetened, archived, transmitted or played out, and with absolutely no concern for what format it was shot in; SD, HD, 1080i, 720p, 4:3 or 16:9. She simply said, "Dad, Lucy is totally cool, now go away... this part is really funny!" ■

Paul Crouch Jr. is the vice president of administration and engineering for the Trinity Broadcasting Network.

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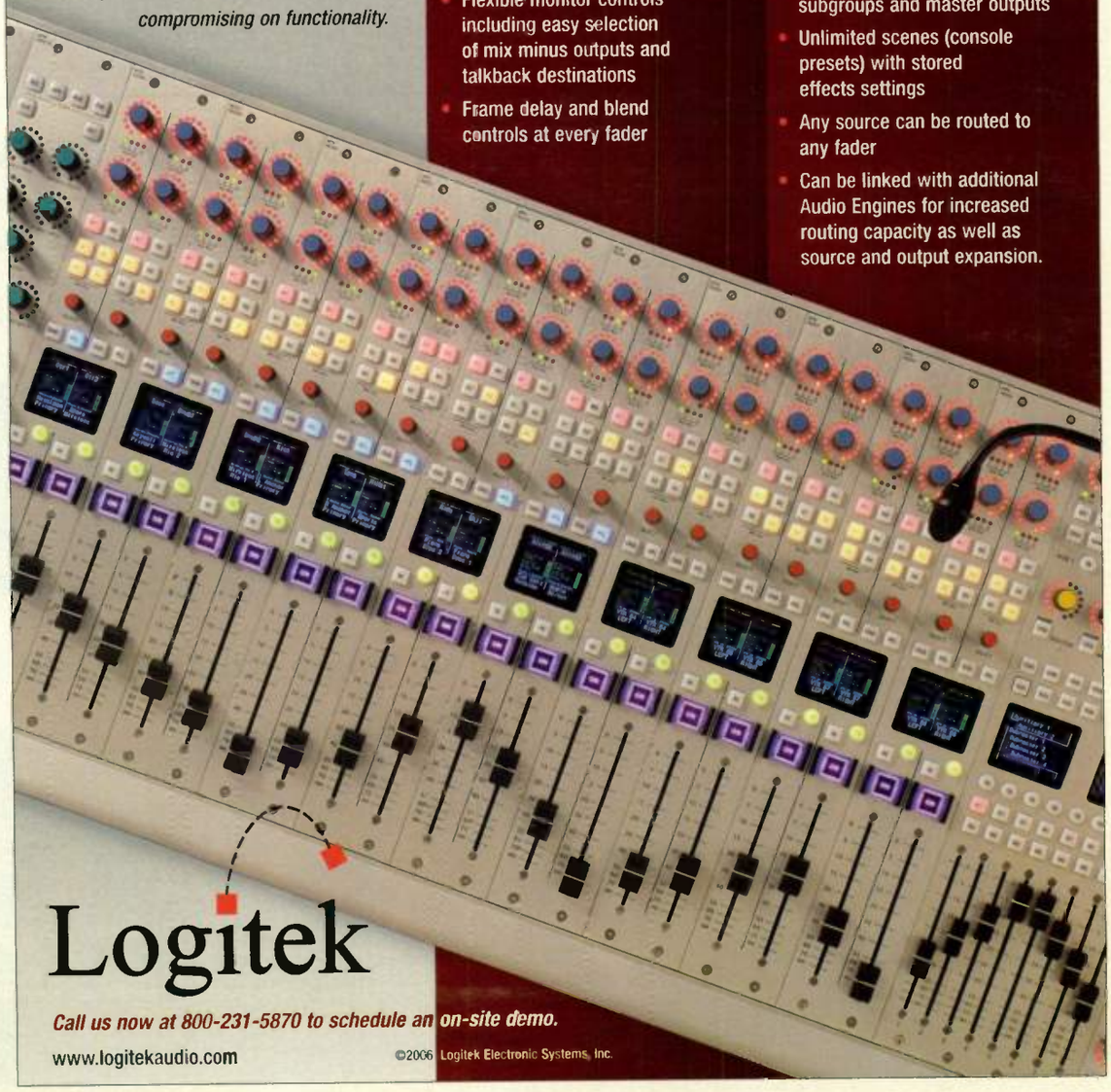

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World Radio History

The Case for Affordable HD Lenses

New processes, technologies driving down manufacturing costs

by Craig Johnston

SEATTLE

New high-definition camera offerings aimed at the ENG, corporate, faith-based and other markets have come down in price. This left those who had last priced an HD lens a year ago wondering why they would pay more for the lens than the camera it sat on.

Lensmakers had a feeling customers were going to be grousing about that, so they've been working hand-in-glove with camera makers to design lower-cost HD lenses that match the performance of the new camera offerings.

Gordon Tubbs, Canon USA's assistant director of the Broadcast and Communications Division, offered this perspective: "If you think about HD over the past 10 years or even longer than that, everything that was produced, from the camera manufacturers, to the lens companies, to all the other companies that were involved, was produced at a Rolls Royce level."

He contrasted that to the new HD camcorders being produced for newsgathering. "Sony's XDCAM HD, for example, [has] a 1440 by 1080 imager, as opposed to a 1920 by 1080 imager. So since there are levels or categories of HD cameras now, we can then build lenses to meet that level."

Canon KT 20x5B KRS HDgc

Dave Waddell, Fujinon, Inc. marketing manager, pointed to lighting as another factor that allows lower-cost lens-making for ENG use.

"They're more or less designed for news applications, or applications where you're working under uncontrolled lighting conditions, where you really couldn't see the improved quality if you really wanted to, because you have no control over your lighting conditions. In a studio, where you can control the lighting, you can see these anomalies that are minute if you've got the proper lighting."

With their only option being the high-priced HD lenses, some new HD camera buyers might be tempted to try to get by with SD lenses. Chris Beauparlant, sales manager, The Americas for Thales Angenieux, pointed to the new lower-cost lenses as another option for those customers.

"HD lenses are a smart investment, and often the right place to start when transitioning to an HD environment, since they will improve the image quality of virtually any camera versus conventional lenses," he said.

AMORTIZED R&D COSTS

What allows them to produce lenses that cost less? Part of the answer lies in the fact they've already amortized the R&D costs for the higher priced lenses, and some of that technology is now applied to the more economical lines. In some cases they've chosen to use lesser grade optical glass, or changed the mechanics of the lens.

All three lensmakers have introduced lower-cost HD lens lines: Canon with its HDgc line; Fujinon with its X-Series; and Angenieux with its HD-e Series.

Angenieux's general purpose 19x 7.3 AIF HD-e offers a focal range of 7.3 to 139mm and weighs 3.7 pounds. Beauparlant predicted this lens will be the "workhorse" of the company's three new economical HD lenses because its combined range and small size.

Thales Angenieux 26x 7.8 HD-e AIF lens

"We made the zoom a little longer and the angle a little wider, and this added versatility will cover a number

LENS, PAGE 27

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World Radio History

FCC Opens Taboo TV Channels

Commission takes steps to prevent interference to broadcast signals

by Deborah D. McAdams

WASHINGTON

The FCC officially opened taboo TV channels at its regular monthly meeting last month, unanimously roving a First Report and Order and ther Notice of Proposed Rulemaking llow "fixed low-power devices" to rate on unused TV channels. Mobile rices and licensing provisions will dergo further scrutiny.

The R&O represents the first time sumer devices will be permitted is deployment in unused TV chan-s. In each television market, which y have from six to 20 TV stations, at t one channel is left fallow between each station's channel assignment to prevent the signals from interfering with one another. Hence, the notion of unused TV channels—considered taboo for TV use, but referred to as "white space" by those who want that spectrum available for personal devices.

After analog TV transmitters go dark on Feb. 17, 2009, TV signals will reside on channels 2 through 36 and 38 through 51. Channel 37 is reserved for astronomy and medical telemetry, and thus excluded in the R&O.

The FNPRM will seek more information on several items raised since the original Notice of Proposed Rulemaking was issued in May 2004. Primary among those is whether or not to allow mobile low-power devices in the TV spectrum. Broadcasters are particularly wary of mobile devices because unlicensed, portable FM transmitters are already wreaking havoc with licensed radio signals. Another item left open to debate is the questioning of licensing.

At the inception of the 2004 notice, it was presumed that spectrum for the low-power, 100 mW devices in question would be unlicensed, and essentially, free. Since then, however, pressure for licensing has increased—particularly after the advanced wireless spectrum auction raised $14 billion. The commission said it wants to see "comments on the relative benefits" of both approaches.

On the side of caution, the R&O banishes mobile devices from channels 14 through 20 because those channels are used for public safety in at least 13 cities. However, the further notice asks whether fixed low-power transmitters should be allowed in those frequencies.

The FNPRM invites comment on whether any type of low-power devices should be permitted on channels 2 through 4, which are commonly used to interface TVs with VCRs. It also makes "detailed technical proposals to facilitate the use of a dynamic frequency selection mechanism to ensure that TV band devices operate only on vacant TV channels." This refers to so-called "smart" technologies that sniff out unused TV channels. Further comment is also invited on geo-location and "control signal interference avoidance." ■

ens

NTINUED FROM PAGE 26

pplications and a broad spectrum sers."

Fujinon introduced three HD ses specifically for the 1/2-inch gers of Sony's XDCAM, with two hem in the lower-cost X-series. In X-series, they brought out a 13x 17x zoom lens.

inon XA22x7BES compact, HD studio s

THE STUDIO

Canon debuted an additional two HDgc lenses at recent IBC2006, bringing a total of eight lenses in the class. There are five designed for camera with a half-inch imager, two for 2/3-inch imagers, as well as one model for the JVC 1/3-inch imager cameras.

Both Fujinon and Canon have also introduced lower-cost studio style box-type lenses, designed for use where extreme telephoto and low light conditions are not an issue. Both are 22x zooms that are engineered for use on ENG style cameras being used in studio or event applications.

In order to cut the cost, lens designers at both companies gave up a little on the light transmission side, and targeted less-extreme telephoto and wide-angle capabilities. Within those limitations, however, both companies tout these 22x studio style lenses as having top-drawer optical and mechanical characteristics.

The Fujinon 22x lens is the XA22x7BES, Canon's is the XJ22X7.3BIE-D.

Readers shouldn't expect any liquidation sales of the manufacturers' higher-end HD lenses in light of the new lower cost entries. All three companies expect continued demand for their top-of-the-line portable and studio-style lenses for use with higher-end cameras and in applications where lower light or more extreme lens ranges are necessary.

Carl Zeiss doesn't plan to introduce a lower-end line of zoom lenses, but instead is narrowly focused on the electronic cine and high-end episodic HD lens market, where they say customers demand nothing but the highest quality lenses.

Jeff Cree, HDVS market development manager for Zeiss' electronic cinema lens development partner Band Pro Film and Digital, said the lower-cost lenses aren't part of the Zeiss marketing plan. "For those kind of products, but you've also got to compromise on performance, and Zeiss isn't willing to do that." ■

HD Lenses: The Early Days

This is a story about sticker shock.

This writer was a production manager for the King Broadcasting Company, then owners of NMTV, at the time Northwest Mobile Television, which has since become National Mobile Television.

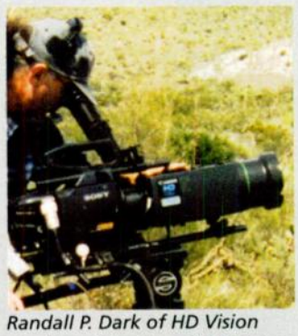
In the 1980s, when the first high definition television products began to appear, I asked NMTV General Manager Tim Abhold when he was going to get some HD gear.

I remember his eyes getting as big as pie pans. "The lenses cost a quarter of a million dollars," he said.

I think my eyes got that big too.

How in the world could HD lenses cost that much?

"I think the reason back then was very, very simple," said Gordon Tubbs, Canon USA's assistant director of the Broadcast and Communications Division. "Nobody had really developed any kind of mass production. We had not developed the technology to build HD lenses that way. HD lenses were hand-made, they took upwards of a year to actually produce."



Randall P. Dark of HD Vision Studios with a Sony HDC-500 camera outfitted with the Canon HV12x5.5 HD lens.

Dave Waddell, Fujinon, Inc. marketing manager agreed. "They were all hand made, and they were 1-inch lenses." Because there were no prior lenses for 1-inch imagers, not only did the optics have to be designed from the ground up, but the mechanics of the lenses couldn't be borrowed from existing zooms.

Tubbs remembered the late Julius Barnathan, then president of broadcast operations and engineering at ABC, famously commenting at the time: "This is all great and good, but who's actually going to pay for all this stuff?"

Craig Johnston

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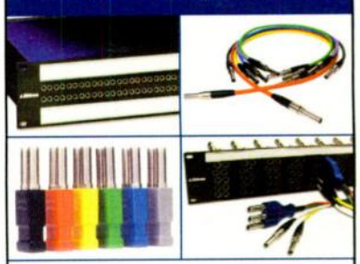

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Converter

CONTINUED FROM PAGE 1

convert digital broadcast signals—hi-def and otherwise—to an analog format, so TVs will continue working after Feb. 17, 2009, when broadcast signals become all digital.

When Congress established that 2009 deadline last year in the Deficit Reduction Act, it directed the NTIA to develop a program for distributing $40 coupons for converter boxes. The law lays out basic parameters: The application period is Jan. 1, 2008 through March 31, 2009. Coupons are limited to two per household. They are to be distributed via U.S. mail, and all coupons must expire three months after issuance. Congress also ruled that coupons apply only to standalone devices that allow analog TVs to display digital signals. A total of $1.5 billion was designated for the effort, including $160 million for administrative costs.

The NTIA was left with figuring out details, including how to determine eligibility. The funding is enough to supply two coupons to around 16.8 million households—roughly the number of American households that rely exclusively on over-the-air TV. The NTIA proposed coupons be available only to those households.

The agency was summarily challenged by the Consumer Union, which said the NTIA didn't have the statutory authority to restrict eligibility. The NAB, Consumer Electronics Association, Association for Maximum Service Television and Association for Public TV Stations also opposed eligibility restrictions.

"The goal of the program is to ensure continuity of service for any unconnected television set, including those that may be in cable or satellite households," the APTS wrote.

Another proposed eligibility criteria was a means test. The NTIA asked if it should distribute coupons only to households with annual income of less than $19,806, the poverty level for a family of four. The TV lobbies once again opposed. In a joint filing, the NAB, MSTV and the CEA said income restrictions would drive people to subscription services.

Two more filers, Garden City Group, a rebate firm in Weston, Fla., and concessions giant Sodexho suggested a means test would cost more than it was worth.

"NTIA should not spend $50 to give away $40 in coupons," GCG wrote.

The NTIA's main impetus for suggesting eligibility limitations was concern about not meeting demand. Solix Inc., a Whippany, N.J. firm that administers public funds, told the NTIA to consider establishing an eligibility threshold after a three-month application period. In doing so, the agency would at least have a clue if demand exceeded the slush fund.

WHAT'S INSIDE

A major concern for the broadcast interests is how well the boxes work. The NTIA proposed using ATSC A/74 Recommended Practice on Receiver Performance. Several filers beseeched the NTIA to go further, including the TV lobby alliance.

"It has... been more than two years since A/74 was published by ATSC," the NAB/CEA/MSTV filing read. "During that period, significant progress has been made... the state-of-the-art has moved forward significantly in some important receiver performance areas."

The group offered specific performance criteria, including improvements on multipath, range of equalizer and signal overload performance.

The media professional division of the AFL-CIO advocated for the performance requirements outlined by NAB/CEA/MSTV, and even the New America Foundation weighed in. The NAF has been clamoring to open taboo TV channels for unlicensed devices, claiming such devices would not interfere with TV signals. The DC think tank asked the NTIA to establish converter specs that would reject interference from unlicensed devices.

Many other parties implored the NTIA to allow electronic program guide, PSIP and smart antenna capabilities. At least one company, DTV chip maker Zoran of Haifa, Israel, said the box should have only basic functionality due to "cost sensitivity." Additional features like an EPG incur royalty fees, the company said.

Other proposed features included downloadable upgrades, NTSC pass-through and power consumption standards. The National Translator Association asked for analog pass-through, since translators are not under the same 2009 deadline as full-power TV stations. The Community Broadcasters Association of Marietta, Ga., made a similar plea, along with Island Broadcasting Co. of Roslyn, N.Y., licensee of five low-power TV stations. LPTVs, like translators, are not subject to the 2009 deadline.

UpdateLogic, the Southborough, Mass. firm that makes ATSC-transmittable software, said the converters ought to be compatible with their technology. PBS subsidiary National Datacast supported downloadable upgrades, as did the NAF.

The Environmental Protection Agency, which is establishing Energy Star requirements for converters, favored an automatic power-down feature. San Jose, Calif. firm Power Integrations offered up a branded algorithm that it says would achieve a highly efficient 740 mW standby mode.

PAPER OR PLASTIC?

Much of the NTIA's proposal focused on the coupons themselves, and how to prevent fraud. Mindful of the debacle that was the federal response to Hurricane Katrina, one NTIA official said, "we don't want anyone telling us we did a heckuva job."

Several filings addressed whether coupons should be paper or plastic.

Sodexho recommended us paper with bar codes, hologra serial numbers, thermo-reactive i or some other counterfoil. It said th would be no way to tie the produc an electronic coupon card.

Sodexho also said counterfeit fr was unlikely given the modest v of the coupons. During the th decades that food stamps were pa Sodexo said counterfeiting was "ne a problem" because the coup denominations didn't exceed $10.

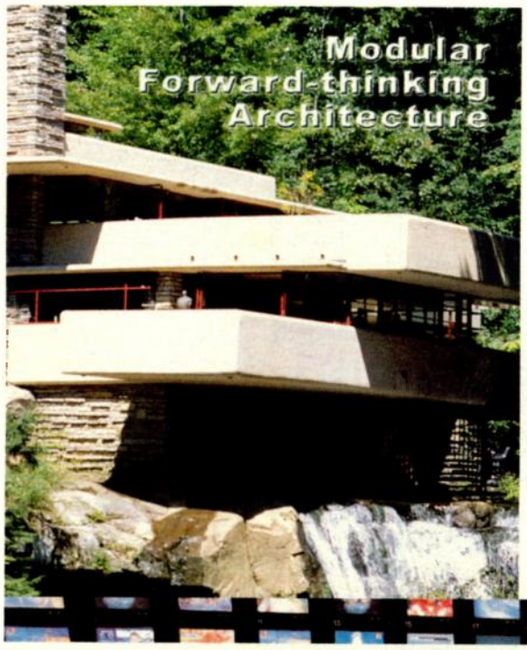
Radio Shack advocated the us electronic coupon cards, which food stamp program now uses.

The Garden City Group said pa may be cheaper initially, but it's m likely to get lost or destroyed than p tic, which people tend to value more.

Best Buy favors cards, but it not that its electronic processing syste currently aren't able to limit them one purchase. Best Buy said it wo require "significant upfront costs" participating retailers to implemen single-purchase coupon card progra and it asked the NTIA to pa necessary upgrades.

The retailer also asked that NTIA require participating stores to upgr between October and January, wh they're swamped for the holidays.

A final rulemaking is expec before the end of the year. ■



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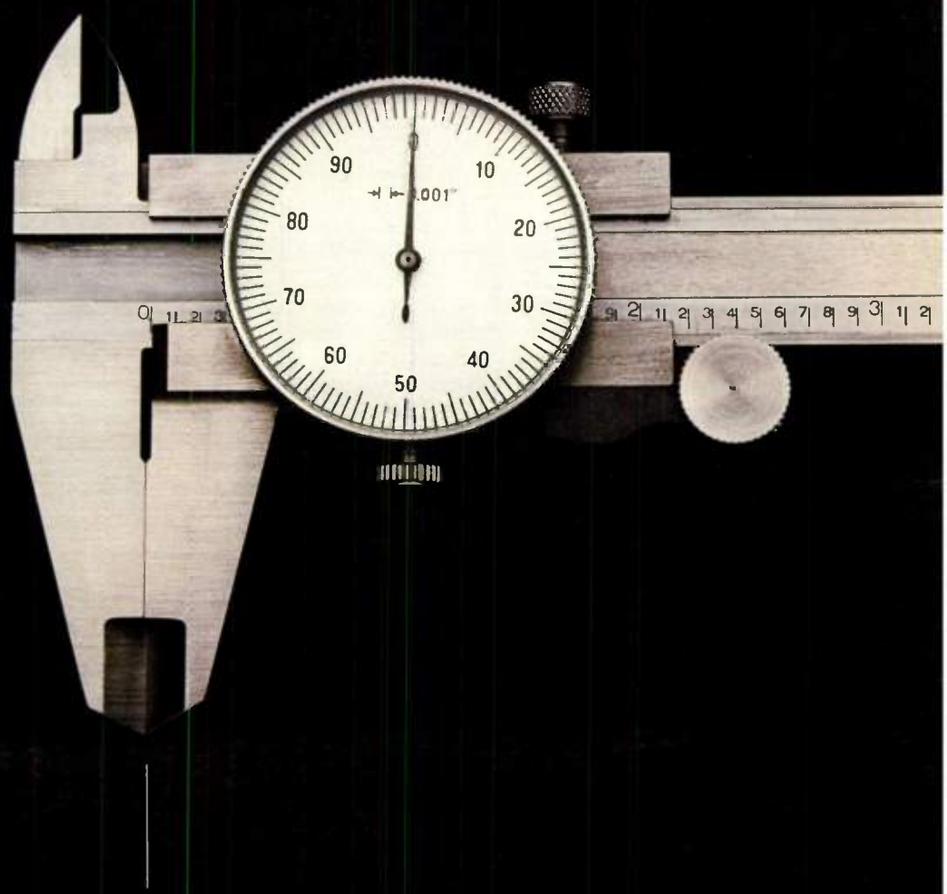

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MEDIA SERVER TECHNOLOGY — Karl Paulsen

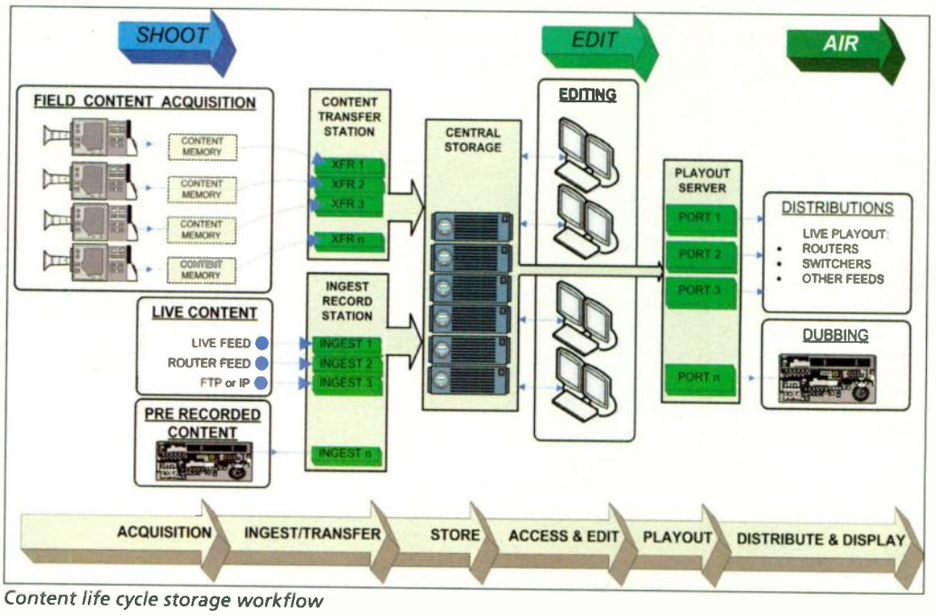
The Content Life Cycle

Media servers, storage and networking technologies for television systems historically follow in the footsteps of IT systems. The latest global revolution in IT storage is now driving content flow for television systems. As such, our industry finds itself continually exploring new dimensions for physical storage and storage management philosophies.

Increasing deployments of server technologies across all aspects of the broadcast business are spurring new growth in how media is captured, transferred, manipulated, played out and stored. Most recently, storage and media management is tasked with addressing the inevitable march toward high-definition programming and content.

HD puts new demands on servers, editing system, storage and network infrastructures. This newest evolution will again change the dynamics of the industry as those early adopters once again become the guinea pigs for workflow and process change.

To validate these up-and-coming solutions, one must understand the workflow and the systems that enable those processes. How content makes its way through a system—referred to as the "content life cycle" is affected by how material is captured, on what media, where it is stored during the production and editorial process, and finally, on to playback and long-term retention.



Content life cycle storage workflow

The content life cycle begins at the moment of image capture and ends when all instances of the content is erased or destroyed (including those database records related to the content). All the places in between contain the variables that make your operations simple or complex.

NEWS MIGRATION

Television news is one particular segment of the media industry that is moving away from videotape capture and on to solid state, removable spinning magnetic disk, or optical media formats. As they do, their storage requirements and associated media management become a little more challenging. The content life cycle must now be modified to handle the random access nature of these field storage devices, altering workflow from field capture to editing to playout.

In the new domain, field-acquired content must move as quickly as possible to the next storage medium, forcing new demands on different resources. One impact is on the storage systems, now tasked with a universal scheme of accessible storage focused on a common centralized storage model.

To news people, turn around is of high importance. Thus, a media transfer mechanism that can ingest, move, catalog and store field-acquired content from "field memory" to the "central store" is essential to avoiding the higher costs of field memory chips or discs. Such transfer systems must be readily available, allow memory to dump to stores in a rapid fashion, and must be of sufficient size and quantity to handle the volumes of content for what is, today, an undefined period of time.

In the historical context of television news, the rapid fire agenda of "shoot-edit-air" puts many complications on the content life cycle. Solid state and direct removable media help make media move faster, but requires another set of intermediate systems to support the stages between shoot and edit.

While prescreening of raw content helps to narrow down what is transferred, it isn't always practical. Pretransfers of raw edit decision lists to the central transfer point, coupled with prescreening, can alleviate some of the transfer bottlenecks, but once that raw content begins its assimilation into the production process, another set of storage and media management requirements takes its place.

Central servers now need to accommodate not only the raw footage, but eventually all the finished stories and substories. Transferring content from a central store to a local workstation is time consuming and impractical. The ultimate goal is to provide sufficient connectivity and bandwidth so as to edit from the central store, online and collaboratively (i.e., multiple editors accessing the same raw content to create two or more stories).

Media management tools required to manipulate content must be intuitive and effective. Content must be

CONTENT, PAGE 41

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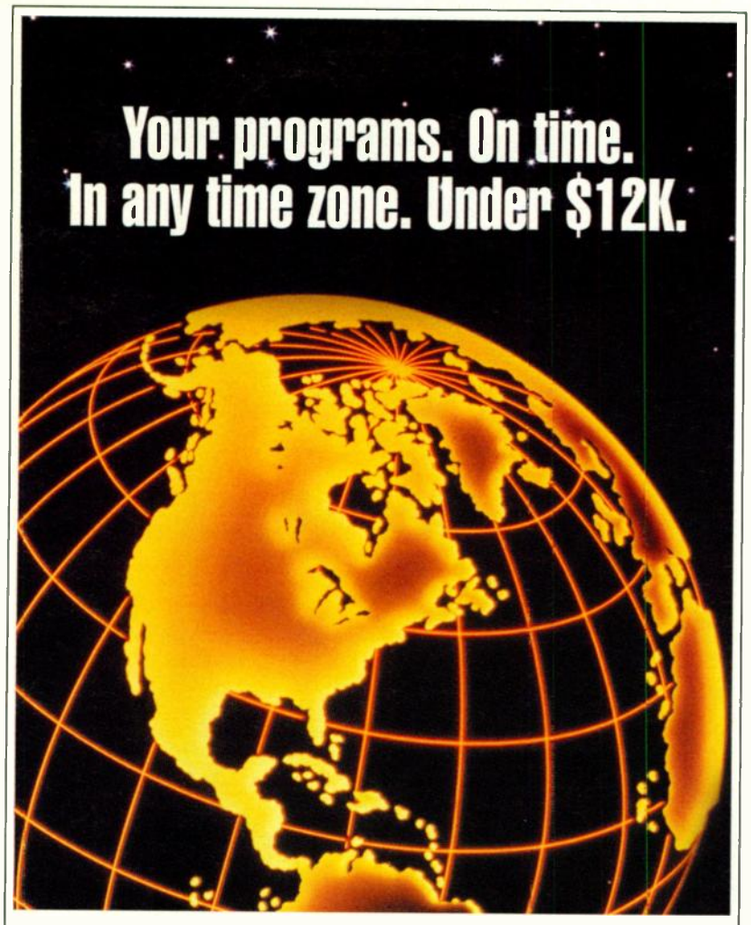

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VIDEO NETWORKING

Wes Simpson

IPTV: A Success Story From Europe

IPTV was a hot topic at IBC this year, and for good reason: service providers are rapidly rolling out IPTV services to consumers all across the continent. Not every venture has been a winner, but there have been a number of successful deployments, and more are on the way.

Graeme Packman, of Understanding & Solutions, a consulting firm in Bedfordshire, England, gave a very interesting presentation on IPTV in Amsterdam, and provided additional data used in preparing this article.

One country where IPTV seems to be taking hold is in France. In the past three years, more than 300,000 subscribers have signed up for IPTV service from Orange (France Telecom).

Alternative ISP Free provides an IPTV service with more than 80 channels in a package that includes Internet access and telephony. Around two-thirds of Free's 1.9 million broadband subscribers are eligible for this package.

Other IPTV providers include alternative operator Neuf Cegetel, which recently acquired AOL France, Telecom Italia subsidiary Alice and T-Online's (Deutsche Telekom) Club Internet.

France has an estimated 25 million television households, with approximately 3 million CATV subscribers and 4 million satellite subscribers (in addition to the 1.5 million subscribers with IPTV service available).

IPTV POOL

According to London consultancy Point-Topic, France had 10 million broadband subscribers as of December 2005, so there are a significant number of potential future IPTV subscribers.

The success of IPTV in France has occurred for a number of reasons, some of which are specific to the French market, and some that may also be true for other locations. Let's take a look at some of the major reasons that I discussed with Mr. Packman.

Due to a very competitive market, the prices for IPTV services are low. Orange/France Telecom's basic IPTV service with more than 40 channels costs just a shade over $20 a month. Free's basic triple-play package that includes high-speed ADSL2+ Internet access, free voice calls to fixed lines in more than 20 countries, and IPTV costs about $38 per month.

VIDEO, SCHMIDEO

At this low price, many Free customers are happy purchasing the package just to get Internet and telephone service, and don't utilize the television services. Incumbent Orange has started to bundle its basic IPTV service, which includes more than 30 channels, free of charge with some of its broadband access offerings.

It always pays to remember that consumers care most about access to content; they don't care too much about how it is delivered.

As mentioned above, the main alternatives to IPTV are CATV and satellite, both of which have penetration far below levels in other countries. In the case of CATV, up to a year ago, there were several cable operators who had not converted the analog base to digital as rapidly as in the United Kingdom without video-on-demand capability.

There have been a number of mergers between CATV operators recently, which should improve the competitiveness of these systems and further push the transition into digital, including the introduction of VOD services. In the case of satellite TV, penetration has been hurt by strict local planning rules that make it impossible for many potential subscribers to mount antennas on their homes. As a result, for many potential viewers, IPTV may be their only way to get digital TV services.

The channel offering of the two large IPTV suppliers is quite extensive. In addition to channels from all over France, both services offer basic-tier

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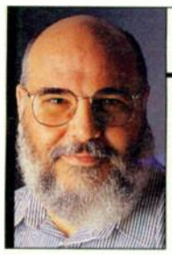

LET THERE BE LIGHTING — Andy Ciddor

Lighting Continuity: Staying On Track

Like scriptwriting, continuity is an art that will be practiced until at least several days after hell freezes over. While we will eventually reach the point where we can build all of the elements for a production inside a computer, the need for a story to tell will never diminish, and the need for that story to unfold logically may even grow in importance.

Continuity is about holding on to our audience's engagement in the flow of our storytelling, despite all of the cinematic devices that we use to compress time, space and plot development in our journey along the story arc.

Storytelling is by no means restricted to the feature film or the drama series. Every news package, community announcement, commercial, program promotion, music video and live cross to the local game, had better be telling a story, or our medium is dead already.

The day is fast approaching when your continuity images can reside in your PDA, smart phone or music/media player.

Most of us have experienced the process of continuity at the hands of people equipped with clipboards, notebook computers and digital cameras, making copious notes at the end of every take, then generously giving everyone the benefit of their obsession for detail at every subsequent setup.

Continuity of position, makeup, hair, costumes, props, sets, prostheses, etc, are the areas most immediately obvious to the viewing public, as evidenced by the fame of the hopping eye-patch and color-changing necktie. However, there are many elements of picture continuity, that while not overly obvious to the casual viewer, will nevertheless have a serious impact on their engagement with the story being told.

Fortunately, most lighting continuity problems are less obvious than in the music clip "You're the One That I Want" from the movie "Grease."

The abrupt and random changes of cloud cover, sun direction, contrast ratio and shadow elevation in this clip serve as an excellent compilation of the pitfalls of shooting an exterior scene out-of-sequence and apparently without concern for continuity. On the other hand, I have been alerted to faked news and documentary pieces over the years, precisely because there was continuity where none should have existed.

As we know from hard-won experience, smooth cutaways and synchronous overlays are just not available in the world of news and documentary

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IPTV

CONTINUED FROM PAGE 32

international programming from a number of other countries in Europe and the Middle East.

In addition, Orange/France Telecom offers more than 200 premium channels. Both operators have also partnered with media group Canal+ to offer premium content. While cost and selection may be paramount, HD content and VOD also may drive subscribers to IPTV.

The HD broadcast market in France is less developed than in the U.S. market. IPTV service providers in France are positioning to capture HD business when it emerges by deploying HD capable set-tops today.

In France, VOD also is not common, and IPTV providers are in practicality the first providers to offer VOD.

Other countries in Europe offer different pictures for IPTV. For example, the United Kingdom, a country with roughly the same number of television households as France, has twice as many digital satellite subscribers (over 7 million). NTL/Telewest operates CATV systems that pass half the homes in the United Kingdom and have 3.3 million subscribers.

Overall, the penetration of digital TV services in the United Kingdom is almost 70 percent of viewers, a much higher ratio than in France or many other countries in Europe.

As a result of these and other factors, the penetration of IPTV in the United Kingdom is much lower—only 30,000 subscribers as of a year ago, according to an article in The Register. U.K. levels are expected to stay below levels in France for several years at least.

The IPTV situation in the United States is also very different. With 110 million television households, IPTV has yet to make a significant dent—less than 0.5 percent of the overall market. The largest company pushing IPTV today, AT&T, has officially rolled out its IPTV service only in San Antonio so far. Another major U.S. carrier, Verizon, isn't using IPTV for its FiOS TV service—they are delivering a broadband (CATV style) video service over optical fiber.

One factor slowing IPTV rollout in the U.S. is that many DSL lines in the country span greater distances and use lower speed technology that is not well-suited for IPTV. Another factor is that more than half the U.S. broadband data users receive service from CATV companies, who have little incentive to roll out IPTV service to compete with their digital cable offerings.

VIABLE DELIVERY

IPTV is a viable new way to deliver content to viewers that, with the right conditions, can be successful in the marketplace. However, it always pays to remember that consumers care most about access to content; they don't care too much about how it is delivered.

Studies by Mr. Packman have shown that the dominant factor driving viewers to digital video technology is to increase their range of content. This is as true for IPTV as it is for previous digital video technologies.

Thanks to Graeme Packman for sharing his valuable data and insights. For more information on Understanding & Solutions please visit *www.uands.com*.

Wes Simpson can be reached at wes.simpson@gmail.com.

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Lighting

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actuality.

When it comes to camera position and framing, there are well-established rules of thumb to help us make decisions about camera moves and shot sequences. That artificial line through the scene that limits the position of the next shot may only exist to be crossed by creative directors, but it really does minimize the viewers' confusion when we are trying to hold their involvement in our story.

There are similar lines in every shot sequence, where cheating the positions of light sources between shots can lessen the impact of the angle change, despite such moves being a direct contradiction of the behavior of light in the real world. Let's face it—deep down, we all know that nothing looks less real on camera than the real world.

LIGHTING STRIKES AGAIN

Lighting continuity is by no means a problem limited to single-camera production. Even when we are working in multicam and actually shooting the same material simultaneously from several angles, there's still no guarantee that our pictures will cut together well, or tell the right story.

A slight change of angle between shots can place the talent against a totally different background or turn a flattering keylight into a source of brooding shadows.

One solution to the keylight problem—abolishing them—is seen today on an increasing number of productions. I have commented in the past on the disappearance of the keylight, the source of the shadows that give the talent three-dimensional properties in our two-dimensional medium.

As the baby boomer generation grows older, many seem to be hanging on desperately to their on-air roles while remaining in denial of the effects of gravity and good living on increasingly aging skin. These valuable talents and their obsequious producers are bullying lighting directors and cinematographers into reducing key/fill ratios, dropping the angles of the light sources, and wherever possible eliminating shadows completely, in a vain attempt to deny the passing of time. Not only does flat, characterless lighting absolve the producer and director from having to plan the shots and camera angles for their productions, it also panders to the vanity of the talent: a brilliant win-win strategy.

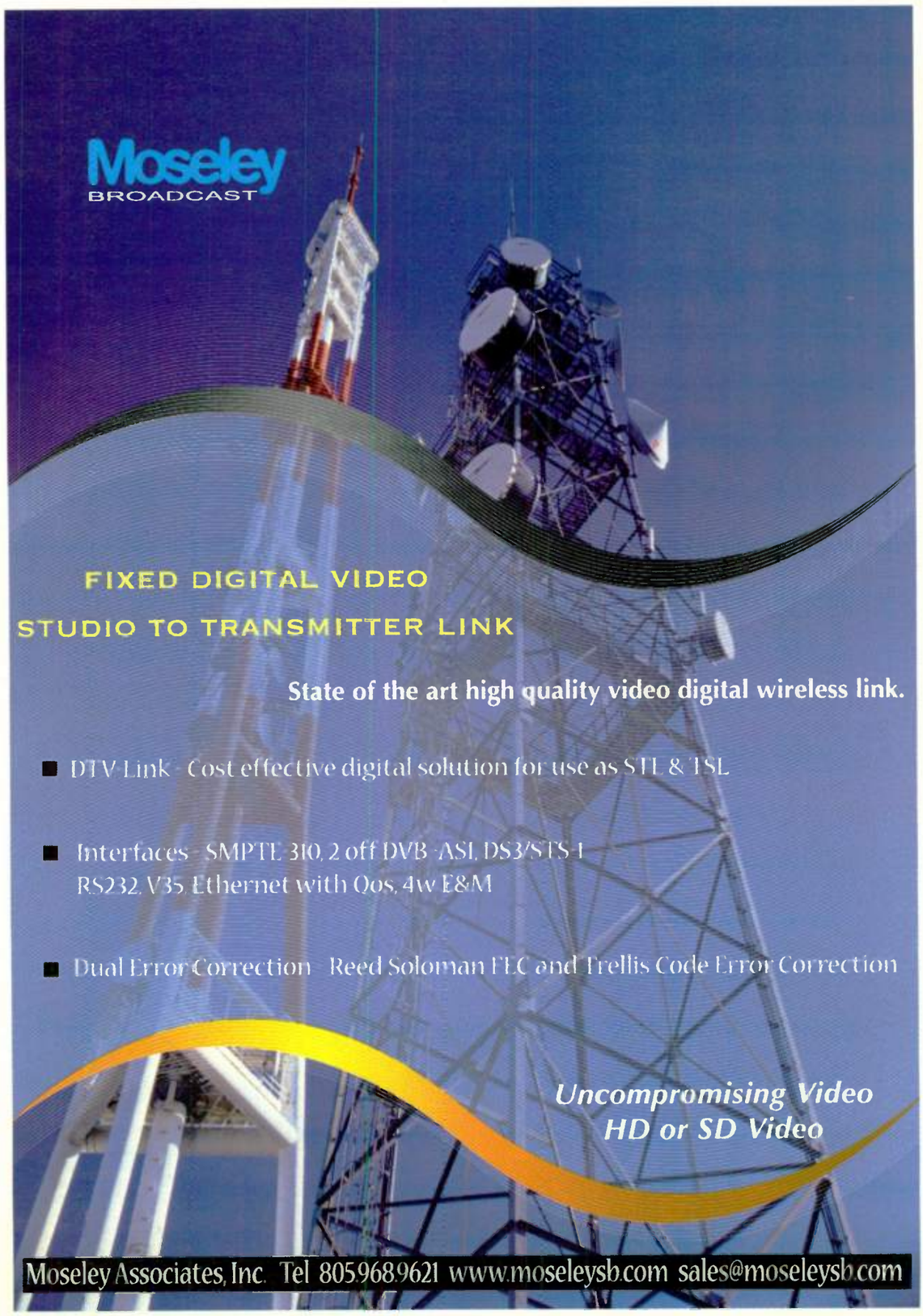
Avoiding such problems merely requires the application of careful production planning and coordination. If the locations of the cameras, talent, and scenic elements are known before we light (rather than when we see the picture on the output monitor), there is every likelihood that we can create a narrative flow of pictures that will neither disorient nor confuse our viewers.

Some continuity requirements result from the conditions that arise as the production unfolds. Matching the seasonal, location, time of day, weather and architectural factors between our pictures requires both a good eye and a good memory. However, with our ability to easily obtain previously shot material and the insignificant cost of shooting a million digital stills of every setup, the record-keeping side of the process is getting easier every week.

While the current iPod's 320x240 display at 64 K colors isn't quite there yet, the day is fast approaching when your continuity images can reside in your PDA, smart phone or music/media player. The good eye comes from carefully distilling the essence of the lighting in one shot then transferring that to the next one.

Lighting continuity comes down to observing and taking account of the established exposure, contrast ratio, color temperature, shadow quality and angle of illumination as we make our pictures. That doesn't necessarily mean matching in every detail, or even matching at all. If our pictures *feel* that they belong together, then we're making our contribution to telling the story.

Andy Ciddor has been involved in lighting for more than three decades as a practitioner, teacher and writer. You can reach him via e-mail c/o ***TV Technology.***



World Radio History

RF TECHNOLOGY

Doug Lung

China's New DTV Standard and DOCRs

RF technology was well represented at this year's 56th annual IEEE Broadcast Symposium. This month, I'll look at two of the many topics discussed at the symposium—the new DTV standard in China, and digital on-channel repeater technology.

More than 10 years ago, the FCC adopted the ATSC standard for terrestrial digital TV. The DVB-T standard was adopted in 1997. If we had the opportunity to create a new terrestrial DTV standard, what would it look like?

At the IEEE 2006, a paper by Jian Song and other engineers working on the project in the Electronic Engineering Department at Tsinghua University, described the Chinese CDMB-T system. It is quite different than either ATSC, or COFDM-based standards such as DVB-T.

This new DTV standard uses advanced forward error correction techniques, can use either multiple or single carrier transmission modes, has a robust frame header with a known PN (pseudorandom noise) sequence and, for multiple carrier implementations, uses TDS-OFDM (time-domain synchronous orthogonal frequency division multiplexing). Frame timing is based on calendar days and minutes.

Although CDMB-T supports modulation constellations ranging from 4QAM through 64QAM, the most robust mode—4QAM—is always used for transmitting the frame header. Performance of the standard is excellent. In addition to the different modulation methods, it allows choosing different code rates and data rates depending on the payload data rate.

The Oriental Pearl TV Tower in Shanghai

Laboratory testing at a code rate of 0.4 with a frame header PN sequence length of 420 symbols, using multiple (3,780) carriers showed a receiving sensitivity of –97 dBm with a carrier-to-noise ratio of only 1.9 dB!

At this coding rate, system payload data rate was approximately 5 Mbps. At the other end of the scale, again using multiple carriers, but with a code rate of 0.8 and a frame header PN sequence length of 945 symbols, the maximum data rate is over 28 Mbps. Receive sensitivity drops to –79 dBm with a carrier-to-noise ratio of 19.8 dB.

These measurements are for an 8 MHz terrestrial channel. Although the paper does not provide any information on performance in a 6 MHz channel, it is reasonable to assume that payload data rate would be less than 75 percent of the 8 MHz data rate, provided the frame header size wasn't changed.

Use of outer BCH (Bose, Ray-Chaudhuri, Hocquenghem) coding and inner low-density parity check, or LDPC coding is a major contributor to the performance of CDMB-T.

CDMB-T includes another mode, 4QAM-NR, which was not discussed in detail in the paper, using 4QAM modulation and NR (Nordstrom-Robinson) coding.

China has filed for patents on the system and many have been granted. Three inventions are fundamental to the CDMB-T system: TDS-OFDM technology; the protection methods for the frame header and body; and a frame structure synchronous to real time, to facilitate automatic wake-up and power saving.

Although European Union countries have settled on DVB-T and the United States on ATSC, it will be interesting to see how many countries outside China adopt this standard.

Although European Union countries have settled on DVB-T and the United States on ATSC, it will be interesting to see how many countries outside China adopt this standard.

Given the performance and flexibility of the standard, I expect to see at least some countries consider it, especially if the patent licensing fees are competitive. For more information on the coding methods used in CDMB-T, do a Google search on "LDPC coding," "BCH coding" and "Nordstrom-Robinson coding."

DIGITAL ON-CHANNEL REPEATERS

While a single-channel distributed transmission system offers the most flexibility and the best performance, it requires distributing programming to each site through a microwave or fiber connection. Digital on-channel repeaters, or DOCRs, appear to be much simpler, since they receive the primary station off-air and retransmit it on the same channel, eliminating the need for the microwave or fiber connections.

However, two factors add complexity. Since timing can't be changed, delay through the DOCR has to be kept to a minimum. Even then, some older ATSC receivers are likely to have

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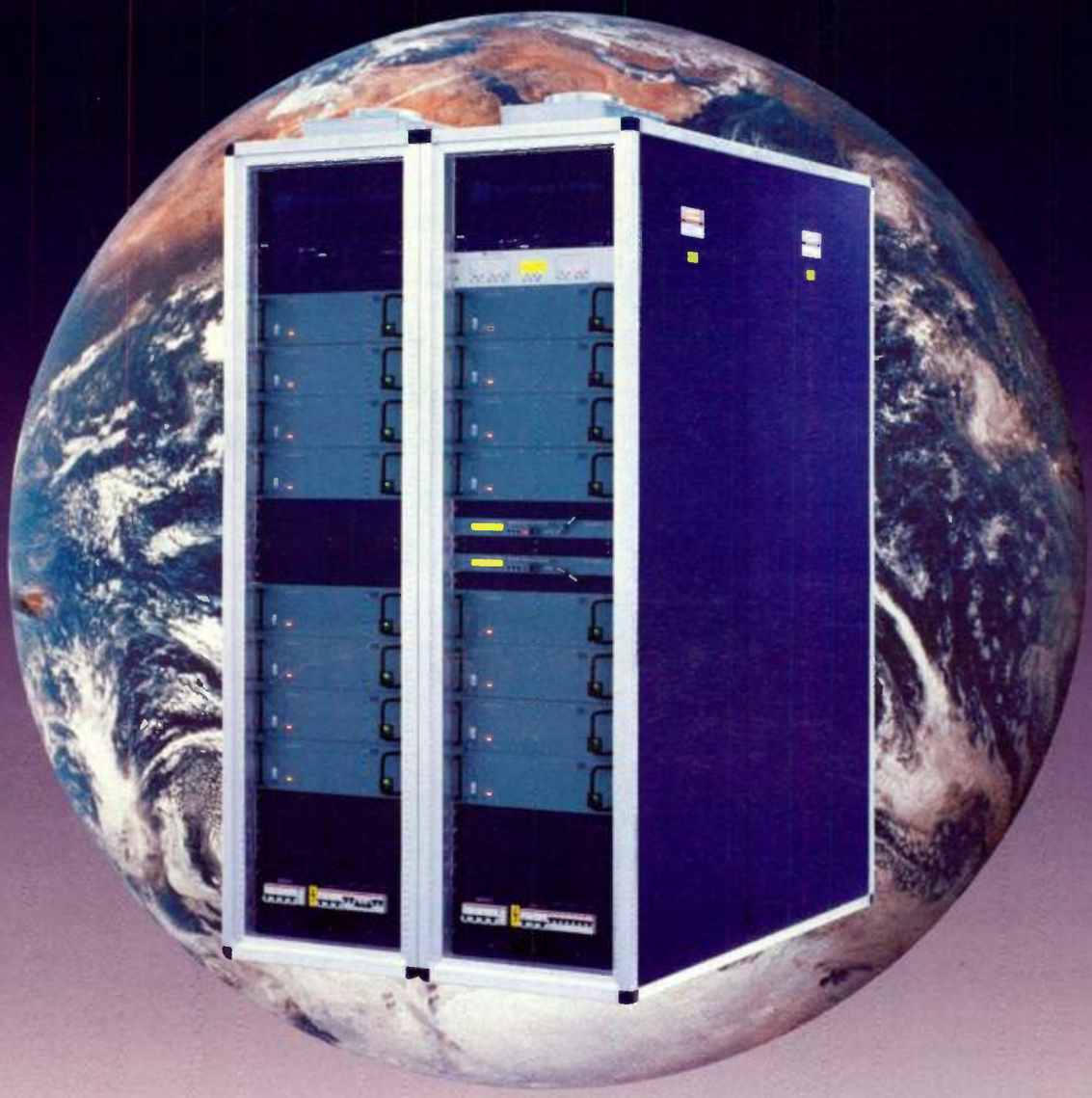

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DOCR

CONTINUED FROM PAGE 36

problems if the main transmitter creates a "pre-echo" to the DOCR output that's outside the range of the adaptive equalizer.

The second complication is that the output of the DOCR tends to interfere with reception since it's on the same channel as the received signal. Papers at this year's symposium offered solutions to these problems.

Kok-Keong Loo presented a paper he wrote with Karim Nasr and others at Brunel University's School of Engineering and Design describing the performance of an echo cancellation system for on-channel repeaters. The echo canceller inserts a training sequence in the received DTV signal. This known training sequence is used by a channel estimator connected to the output of the receiver's low-noise amplifier to generate taps for an FIR filter, which then removes the loopback signal generated by the DOCR from the primary station's signal that's amplified and provided to the antenna.

While the system was designed and tested for DVB-T and DVB-H networks, it should be able to be adapted for ATSC. In a DVB-T system, the guard interval duration sets the maximum processing time and therefore the number of taps possible on the FIR filter. This may not be as much of an issue for ATSC implementations, assuming the use of fifth-generation receiver chipsets.

DELAY SPREAD

The paper has a table showing the delay spread in microseconds for different areas. They range from 0.110 µs for rural areas, to 0.932 µs in typical urban, 2.47 µs in "bad urban" areas and finally, the worst case, hilly terrain with a 6.22 µs delay spread.

As delay spread increased, more taps are needed to handle the echoes. For an 8,000-carrier COFDM system, the maximum processing time can be as much as 8 µs, allowing use of 80 taps at a 10 MHz sampling rate for cancellation. For COFDM systems using 2,000 carriers, the maximum allowable delay is around 2 µs. Even with this constraint, the technique can achieve echo cancellation above 20 dB for all but the bad urban and hilly environments.

According to the paper, this system has been simulated but not yet implemented in hardware.

One technology that has been implemented in hardware is the equalized DOCR developed by the Korean Broadcasting System and ETRI. This DOCR includes digital signal processing technology that removes RF loopback signal. It also corrects linear and nonlinear distortions, improving the output SNR (signal-to-noise) ratio.

Young-Woo Suh presented a paper he wrote with other engineers from KBS and ETRI describing "Field Test Results of Digital On-Channel Repeaters in the DTV Transmission Network in Korea." Suh explained that repeaters are essential for the implementation of DTV in Korea, as the country currently has 20 transmitter stations and more than 300 analog TV repeaters.

The DOCRs designed by KBS and ETRI now allow two modes. Mode 1 includes the circuitry needed to cancel RF-coupled signals and correct received channel impairments as well as distortions (linear and nonlinear) in the DOCR high-power amplifier. This mode is suitable for high-power systems and those with transmit/receive isolation below 70 dB. It is capable of transmitting signals with signal-to-noise ratios greater than 30 dB, but delay can be as much as 5.7 microseconds. It allows higher power and wider coverage, but requires repeaters that are more complex and costly than the mode 2 DOCR.

The mode 2 DOCR uses a low-pass filter to reduce adjacent channel interference and a linearity corrector to remove amplifier distortions, but includes no equalization circuitry to cancel the RF loop-back signal. SNR is typically less than 20 dB, but delay is under 3.9 µs using a low-pass filter with 256 taps. This mode is suitable for low power, small coverage areas where low delay is needed. It also is less complex and, as a result, less expensive.

How well do the Korean DOCRs perform? As expected, in most of the tests, the ability of the receiver to handle pre-echoes (the echo arrives before the main signal) was critical. This meant fifth-generation receivers, which handle pre-echoes over the same range as post-echoes, were required to take full advantage of the DOCR.

In the second phase of testing at Suwon, South Korea in 2005, a transmitter output power of 20 watts was used, while there was minor improvement when second generation (1999) DTV receivers were used.

Adding the DOCR provided only minor improvement with the second generation (1999) DTV receiver—out of 24 sites, eight had coverage with the DOCR on, one more than with the DOCR off. The fifth generation (2004) receiver provided better reception with or without the DOCR. With the DOCR off, it worked at all but four of the sites. With the DOCR turned on, all sites had reception.

For both receivers, ease of reception as measured by antenna pointing angles improved with the addition of the DOCR. Similar improvements were noticed during testing at the KwangMyung site.

This test compared performance of third- and fifth-generation ATSC tuners with the DOCR on and off. The improvement in this test was greater with the third-generation receiver, which had successful reception at 19 of the 26 sites with the DOCR off, and 24 of the 26 with the DOCR on, than with the fifth-generation receiver, which had reception at all but two of the sites even with the DOCR off, and worked at all 26 sites with the DOCR on.

The study concluded a DOCR system was effective in improving coverage, not only by increasing the number of sites with successful reception, but by significantly improving the ease of reception as measured by an increase in reception angle from tens of degrees to almost 360 degrees when the DOCR was switched on.

If you agree with me that providing good reception with indoor antennas and portable devices, especially in urban areas, will be essential for the success of over-the-air HDTV, in many markets DOCRs or distributed transmission systems will be needed to fill in the shadows. Engineering these systems to reduce interference to older DTV receivers, however, will not be easy.

As always, comments and questions are welcome. E-mail me at dlung@transmitter.com.

If you agree with me that providing good reception with indoor antennas and portable devices, especially in urban areas, will be essential for the success of over-the-air HDTV, in many markets DOCRs or distributed transmission systems will be needed to fill in the shadows.

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NEWSROOM TECHNOLOGY **Harlan Neugeboren**

The News Professional Case for Going to CES

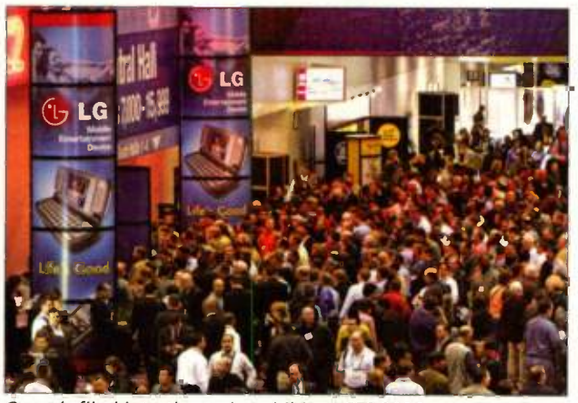
I know that budgets are tight and we all have enough to do in our busy schedules and convincing management to go to yet another tradeshow may be impossible, but the Consumer Electronics Show is probably the one show besides NAB that every news professional needs to attend.

Seeing what the vendors are pushing as the next consumer platform can provide invaluable insight into what devices and platforms viewers will use to get content. Also, some of the technology may be useful in producing news.

IPTV

IPTV is probably the most misunderstood term in our industry. Simply put, any A/V content delivered via the IP protocol is IPTV... Windows Media streaming is via IP and is the basis for the new Microsoft IPTV platform.

Last year at CES, Microsoft showcased the new IPTV platforms that it will be rolling out with AT&T; and Microsoft Foundation Edition, the guide for the current Verizon FiOS rollout. The Microsoft IPTV suite contains a program guide, channel building tools, VOD tools and interactive application tools.



Crowds filed into the main exhibit at CES 2006.

In the Yahoo tent outside, Yahoo showed its next-generation television platform based on Yahoo Go, which creates a unified look across the Web, mobile devices and TV. Some of the platform is based on the Yahoo Widgets, little desktop applications that are very easy to use, and have a bold graphical look.

Why care about these platforms you may ask? Because they will be delivering content to your customers. Each of these platforms has interactive components, and understanding how these work, and the possibilities for delivering interactive news content, is very important. News, traffic, weather, sports scores and closing information work very well on interactive platforms and they give you the ability to be more local if you know what ZIP code the set-tops are in. They offer new advertising and revenue opportunities.

If the number of video iPods is any indication of how small a screen viewers are willing to use in exchange for the freedom to view things when and where they want, then all of us should spend some time wandering the aisles of CES to look at the multitudes of portable media devices.

PIONEER, PAGE 42

Seeing what the vendors are pushing as the next consumer platform can provide invaluable insight into what devices and platforms viewers will use to get content.

World Radio History

Content

CONTINUED FROM PAGE 30

available to everyone, so networking becomes a critical factor because at rush hour, you cannot afford to have the servers, storage silos and the network slow to a crawl.

ALMOST TAPELESS

Faith and trust in disk-based storage platforms, and their associated networks, still forces organizations to offload to videotape for airplay, backup or protection. At peak times, overloading the server responsible for play-out with editors rushing to complete the stories that air in the next five minutes can be disastrous. Hence, finished stories are either cached to another server for play-out, or copied to videotape and rushed to the dusty (or is it trusty) old videotape transport.

Content must be available to everyone, so networking becomes a critical factor because at rush hour you cannot afford to have the servers, storage silos and the network slow to a crawl.

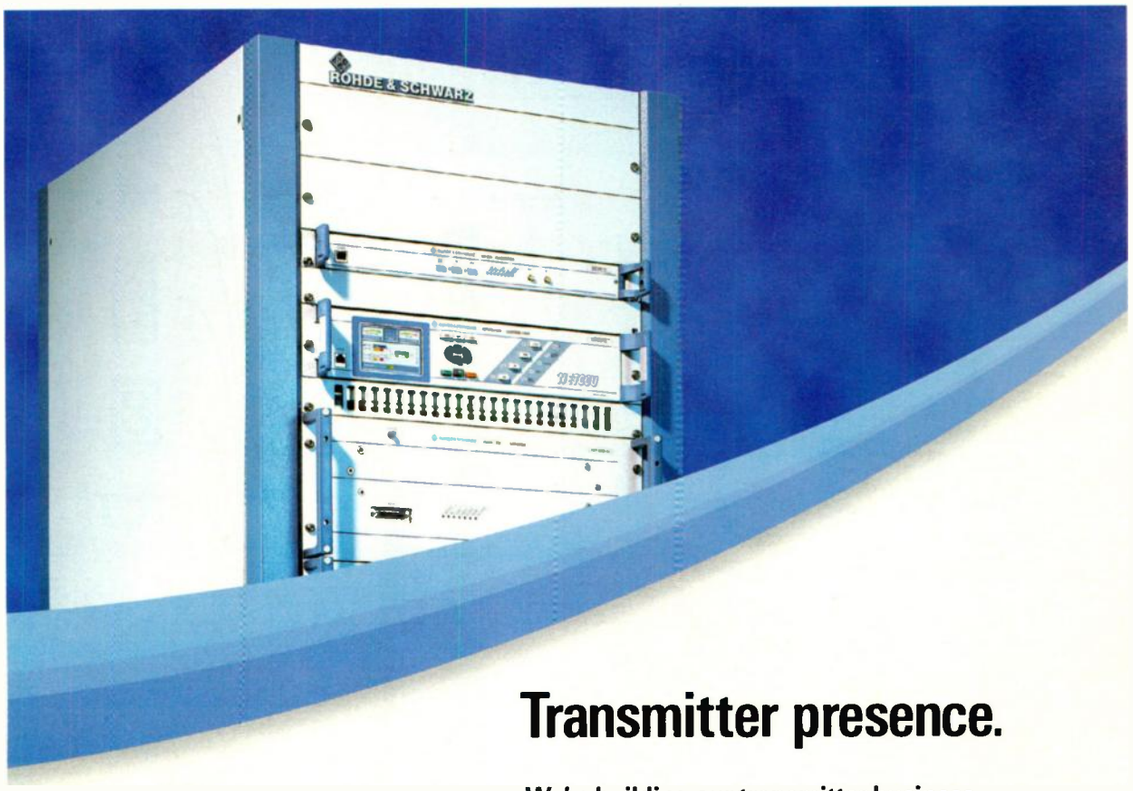
At the other end of the spectrum, on top of storage capacity and media movement issues, is the management of backup and protection procedures. The practices for addressing what content is backed up, where and what it is backed up to, and for how long it is retained seems to have no consistency from one organization to another.

In the content life cycle, managing completed stories so that content is retained for the inevitable return of that same subject is part of the process called "archiving." As television journalism invariably creates some of the largest volumes of individual sets of content, each with their own merit to the organization at an often intangible perspective, this archive process is becoming an essential element for daily operations.

Editorial storage requirements grow in response to increased crews shooting more material for new and different shows. Re-editing of stories for different purposes further gobbles up storage and network bandwidth. At a daily operations level, raw footage and finished stories are sometimes managed solely upon the physical amount of available space on the servers. Once that storage reaches capacity, news departments return to the old standby—videotape—which allows them to offload material and make space for the next sets of stories and raw material. Then the cycle starts again.

New systems in the marketplace alleviate the dependency on legacy technologies to satisfy long term storage requirements. In our next installment we will look at some practical methods for retention of content at a global level for the facility. These new bridges between storage systems, including news and play to air, are helping make the content life cycle more manageable.

Karl Paulsen is chief technology officer for AZCAR. He is a Fellow in the SMPTE and a SBE Life Certified Professional Broadcast Engineer. Contact him at karl.paulsen@azcar.com.



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Pioneer

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Microsoft had a whole section of its booth dedicated to certifying devices for Windows Media Player. The company also showed connectivity between its Media Center application and these devices. With Media Center, a viewer can record a particular program and then download it to a portable device.

iTunes has made deals with many program suppliers to allow users to download their favorite shows. Users can also choose from a large selection of Podcasts.

So why should engineering, operations and programming people care? Because the iPod has shown that if you give users what they want the way they want it, they will watch it. Why not give viewers the ability to download specific stories or special segments? It's fairly easy to do and will show your viewers that you are aware of the trends and are working to meet them. This could potentially open new revenue opportunities if these segments are sponsored.

MEDIA CENTERS

Microsoft recently released the Media Center Edition of its operating system, which allows users to centrally store all of their music, photos and videos and serve them to extender devices connected to a television or stereo. It also provides PVR functionality, a program guide and excellent search capabilities.

Apple has its Front Row application, and it recently announced the ITV, which will connect to any Mac and allow users to view media from that computer on the TV.

There are external devices that add PVR functionality to any Mac, and there are a few that look like the Mac Mini and are designed to sit right below the Mini.

WIRELESS

The London subway bombings showed that viewers just want information in whatever form they can get it. Therefore, low bit-rate MPEG will do in a pinch... At last year's CES, every major cell phone maker and wireless provider was represented, and there were a number of phones that allowed a user to edit video.

The quality of the cameras in these devices is growing rapidly. Three megapixels for stills and one for video is pretty standard. Also, Final Cut Pro and Apple support 3GP, one of the most common compression methods used for cell phone video. Shoot on a cell phone and edit on a Macbook... a pretty low-cost ENG kit.

The are also quite a number of wireless broadband cards that will plug into a laptop and give you rates up to 1 mbps for uploads. This is on the new Sprint Powervision network.

Windows Media at 1 megabit looks pretty amazing.

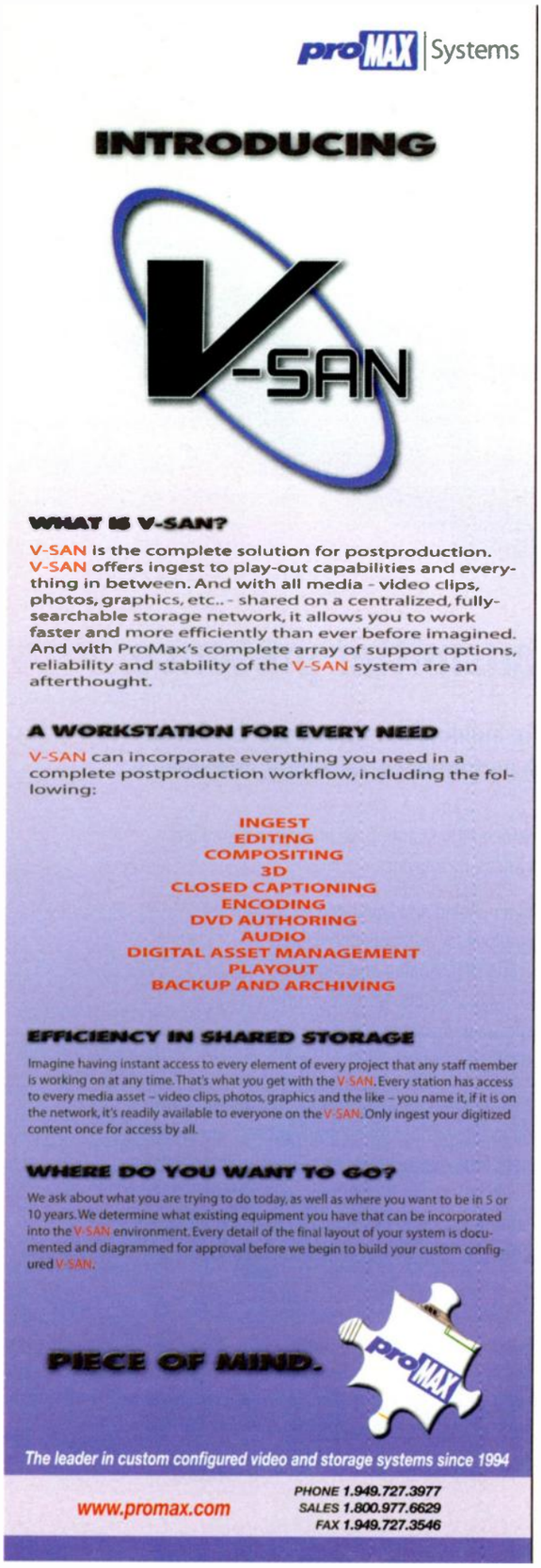
While I am not advocating these tools for everyday use, you should certainly consider adding them to your content gathering toolkit. As competition increases, you will need every tool available to produce cost-effective content that will retain viewers.

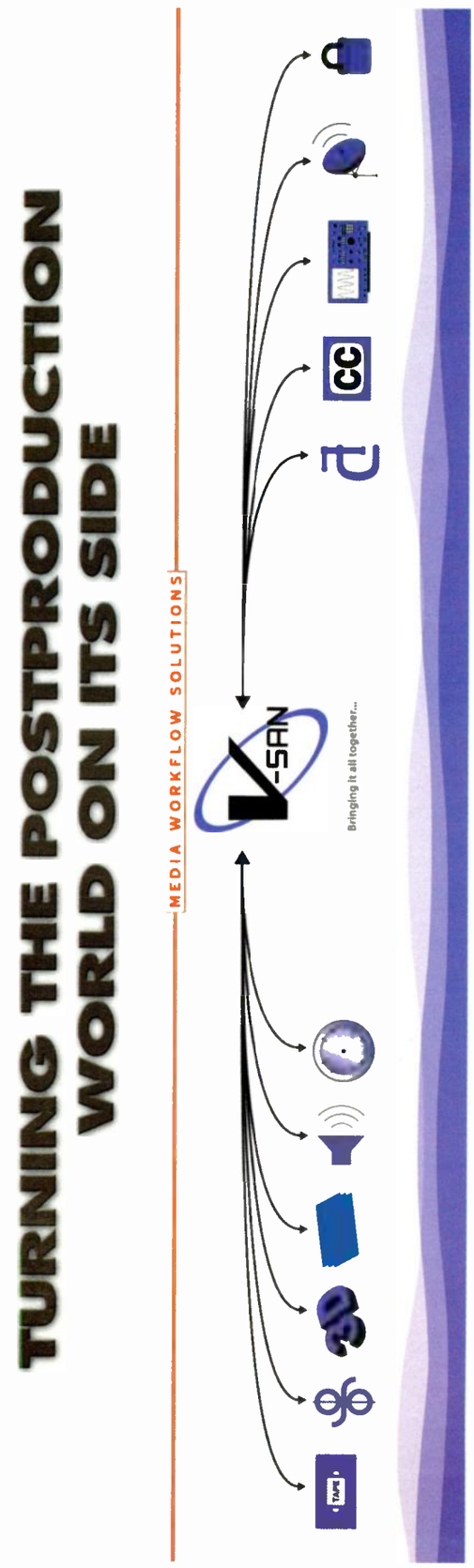
CONSUMER BEHAVIOR

Careful examination of the offerings in the consumer electronics marketplace will provide great insights into how viewers consume media. By understanding how consumers use the devices, we all will be better able to develop and implement technologies that will support the distribution of programming to these platforms.

The days of a viewer sitting in front of their television to watch the 5, 6 and 11 o'clock newscasts are fewer and fewer. Those of us who accept this and develop ways to deliver programming when, where and how the consumer wants to consume it will go far.

Harlan Neugeboren is CEO of The Workflow & Technology Group. He can be reached at Harlan@wftgroup.com.





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INSIDE AUDIO | Dave Moulton

As The Spud Turns: More Confessions

Our story to date... last month I described my well-meaning efforts to upgrade my living room TV into a small, pleasant home theater.

At the end of that column, I intimated that I had more to say about what I found. In spite of a substantial budget and the assistance of some well-qualified professionals, the system does not quite work as advertised and it is unlikely to fully do so without a major, expensive revision (almost pitching everything and starting over).

Viewed in that light, our TV production/distribution/delivery system ain't quite (A) what we would like it to be, (B) what we say it is, or (C) what it oughtta be. And we've all got to share responsibility for this.

PROBLEMS I'M NOTICING

The basic core of the problem goes like this: although everything works together sort of, nothing works entirely correctly, and the system really doesn't work together all that well.

While there may be periods of really nice HD video and decent 5.1 Dolby Digital audio, this is most definitely *not* a high-definition experience.

While there may be periods of really nice HD video and decent 5.1 Dolby Digital audio, this is most definitely *not* a high-definition experience. It isn't that seamless, smooth, compelling and effortless enjoyment of video that the producer intended us to enjoy (and that we've been promised). Instead, it is a clunky, slow, uncertain experience and the mechanics of it seem to demand constant intervention.

Further, as we attempt to integrate elements of the system, we lose many of the individual features and benefits from various components of the system. For example, Bang & Olufsen has an excellent screen-stretching algorithm that is almost invisible, as well as quite convincing.

However, in order to receive HD from DirecTV, I had to abandon that quite clever benefit and revert to DirecTV's screen stretcher, which makes everyone look as if they were finalists in a Boston Baked Bean's-eating contest! So much for that enhancement. I'm back to a clunky 4:3 aspect ratio for most stuff. Yecchh!!

No manufacturer makes a complete system (from the TV camera and

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microphones to the home screen and loudspeakers) except possibly Sony.

Mostly, manufacturers make, or try to make, products that deal with one or more parts of the process and, theoretically, fit into and enhance "the system."

It is particularly to the manufacturers' benefit (profitwise, which is in fact a big deal), to enhance the system. This leads manufacturers to strive for excellence and to differentiate their products from those made by others, which are presumably less excellent. This is all sweetly reasonable.

The problem arises, however, when such differentiation interferes with smooth or correct operation of the system. Two badnesses accrue: the first has to do with the manufacturer appropriating language to describe features of the system, so that Dialnorm becomes something like "SuperEnhanced Intelligent Level Sense®," confronting the end user with jargonal incoherence and preventing her or him from determining what is going on.

A worse badness occurs when said manufacturer decides to add extra enhancements and features. Scientific-Atlanta decided, for instance, to add an extra audio compression option on their set-top boxes, in addition to or contravention of the Dolby metadata standards. What does it mean? What does it do? Who knows? It's a mystery setting.

As I noted above, manufacturers don't do this out of spite or customer hatred. All the ones I've worked with seem to genuinely care about making better, more effective products. And given their expertise in their particular niche in the system, they notice things where they may genuinely make improvements.

Consider Scientific-Atlanta's extra compression setting, for instance, or B&O's stretched screen. It is reasonable to assume that they both do good things and make a positive contribution to the outcome of the system (which I tend to think of as end-user satisfaction).

Why should they be constrained? Why shouldn't they be allowed to try to make the system better?

PITY THE POOR PROVIDER

The service providers are in a similar fix. They exist in that tender region between the rubber and the road. They get big bundles of signals from a diverse bunch of sources and then distribute said bundles to their subscribers. They get paid by their subscribers, (that'd be me) for doing this.

Therefore, it is in their interest to please their subscribers. And if something is wrong, they are the ones who receive the complaints, regardless of who is actually responsible for said wrongness. Does loudness variation between channels come to mind?

At the same time, service providers are well-advised to do as little tampering as possible with suppliers' signals. Producers (that'd also be me) have our opinions about how things should look and sound, and we do not take kindly to others gratuitously reworking our efforts to make them better. We tend to think our productions are perfect already and should just be left alone!

My personal experience with service providers hasn't been all that hot, and I get the sense that they are still working on obtaining marketshare and getting their infrastructures to work reasonably reliably, if cheaply.

They don't seem particularly sharp on customer relations, customer satisfaction or signal quality management. Unfortunately, their operations have been sufficiently opaque to me that I can't really figure out whether the problem lies at the management or operations level, or what combination of the two is involved.

It does, however, seem like a no-brainer to me to bring channel-to-channel audio levels and picture color to a reasonable level of consistency, and I confess I cannot understand why they don't do it as a matter of course. It ain't rocket science and it ain't expensive.

Nonetheless, the service providers are stuck between program sources of wildly varying level and quality and subscribers with wildly variable installations, expectations and states of mind. There is, in fact, no reasonable way they can satisfy everybody.

WHAT DOES IT MEAN?

For very good reasons, manufacturers make gear sufficiently idiosyncratic that it doesn't necessarily work very well with other manufacturers' gear, or fit in the system all that well. Unintended consequences abound. At the same time, service providers are dealt a fairly shabby deck of signals they are expected to make into really nice signals for their subscribers, while not, ah, changing them from what the producer ostensibly wanted. How are they supposed to do that? It's a puzzler!

In any case, the result is a moderately dysfunctional system that cannot reasonably be regarded as high definition.

More needs to be said. Next month, we will learn to also pity the poor broadcaster (that'd be you!) and the poor couch potatoes (that'd be me!). Then we'll consider what we might do in a more perfect world.

Thanks for listening!

Dave Moulton is a semiprofessional couch potato, who gets baked on the weekends! You can complain to him about anything at his Web site, www.moultonlabs.com.

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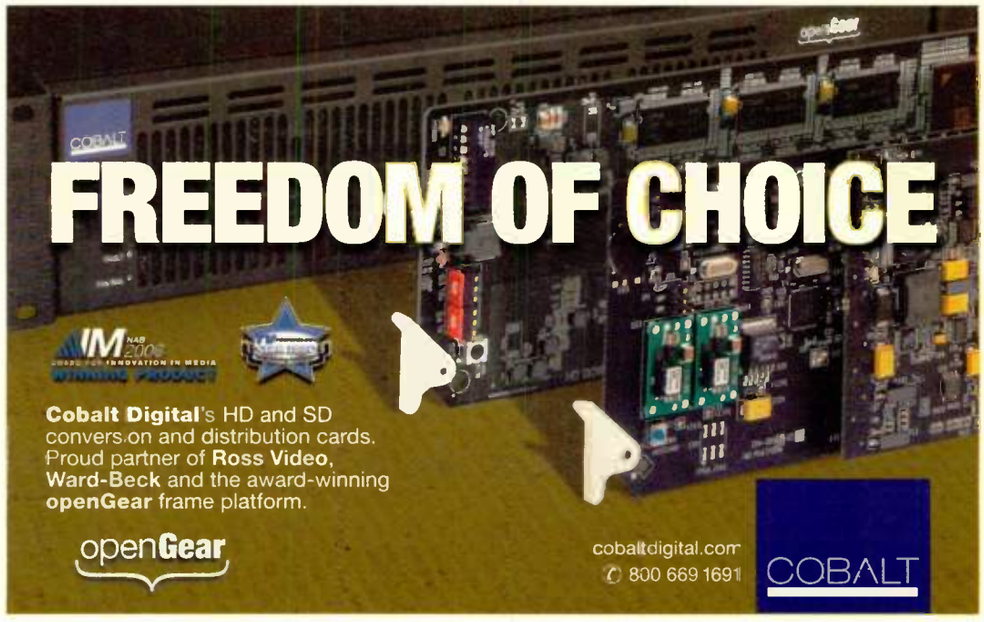

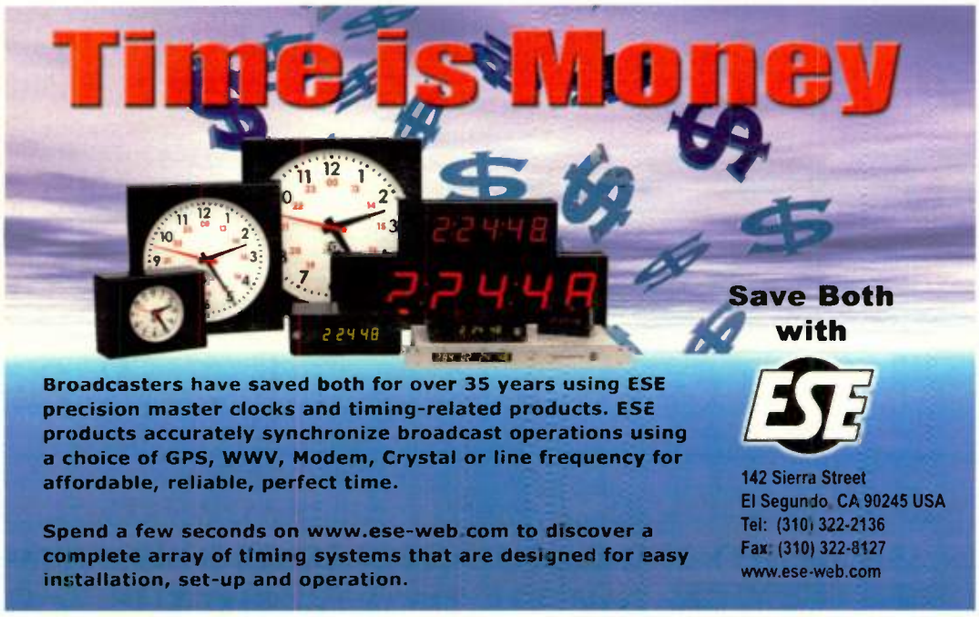

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VIDEO/IT CABLE TRANSPORT

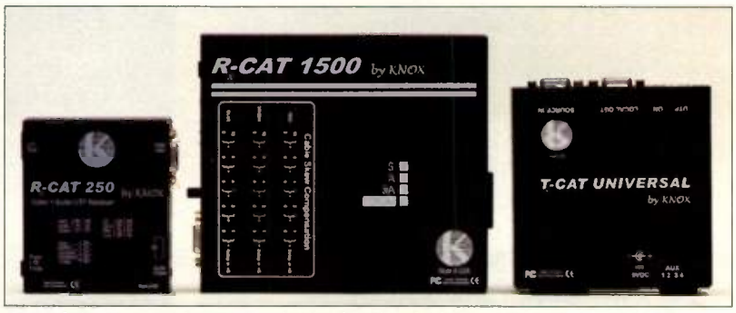
Knox Delivers Quality Video Over CAT-5

by Joey Gill

As broadcast converges with IT, the equipment associated with each industry is starting to resemble a hybrid of the two. It is now common for computers to handle multimedia, and for broadcast equipment to be controlled and managed by a PC. To take this trend even further, many tools that were once specifically used for one trade can now be used in many industries. Cabling is no exception.

Anyone who has ever tried to distribute composite video and analog audio over distances that exceed 150 feet will know that the signals will suffer some degradation. As the distance increases even further, the video and audio can suffer to an extent that they are unusable.

Cable designers have been experimenting with sending high-frequency signals over UTP (unshielded twisted pair) and STP (shielded twisted pair) cables for generations. The cable technology has advanced to a point where the process has gained worldwide acceptance. In addition to cable design, innovative equalizing and processing technology has also contributed to the success of the TP technology. CAT-5 (category 5) cable is certainly one of the more popular success stories. Virtually all new construction in the United States today contains some CAT-5 cabling, including government, business and homes.



Part of the Knox Video Technologies family of CAT-5 audio/video transport devices

Recognizing the success of this cable standard, Knox Video Industries has developed a signal distribution process utilizing CAT-5 cable for many types of video and audio. Using the latest technology, CAT-5 cable does not share the limitations that exist with coaxial cable, with regard to video signals. Distribution distances of up to 1,500 feet are possible using technology employed by Knox.

For this review, Knox provided three test units: the T-Cat Universal Transmitter, the R-Cat 500 Receiver and the R-Cat 1500 Receiver. Knox requires that all CAT-5 cabling follow the TIA-EIA T568B wiring specifications (a copy is included with each unit).

FEATURES

The T-Cat Universal Transmitter can transmit the following formats over a CAT-5 cable:

- RGBHV video
- RGBHV video and stereo audio
- RGBHV video and simplex Uni serial option
- YPrPb, Y/C, or composite video and stereo audio
- YPrPb, Y/C, or composite video and simplex Uni serial
- Composite video and stereo audio

A series of jumper connectors inside the unit allows many different configurations to be set. The proper jumper positions for the different formats are laid out in a very simple table in the users manual. Connectivity is accomplished using the four-position "Phoenix" connector, the single RJ-45 connector, the two HD15F connectors and the 3.5 mm power inlet.

The unit's dimensions are: 1.2-by-4.2-by-4.3 inches. It weighs in at 0.8 pounds. All of the units come with an external wall-type power supply that provides 5 watts at 5 VDC. In addition, all of the units tested had a steel enclosure, and rackmounting brackets are available as an option.

The distance that the T-CAT Universal Transmitter can be used depends on which series of Knox receiver is selected. All units tested listed an operational temperature range of between 32 and 104 degrees F. Obviously, these devices are designed to be used indoors.

The R-CAT500 receiver is primarily for distribution distances of 500 feet or less. It supports VGA, SVGA, XGA, XGA-2, RGBHV, RGB, composite, S-Video and component modules. The two-channel audio output is 600 ohm unbalanced. Jumper connectors are present inside the unit to allow different configurations, depending on the format desired and the options purchased. The dimensions are 1.2-by-5.6-by-6.2 inches and it weighs 1.4 pounds. There are two RJ-45 connectors, a single HD15F connector, the DB9M connector and the 3.5 mm power inlet. Skew compensation is adjustable for red, green, and blue, and an overall equalization adjustment is also provided.

The R-CAT1500 Receiver is for receiving signals at distances of 1,500 feet or less.

It supports the same formats as the RCAT500 and connections are the same, depending on the options purchased. The unit's dimensions are: 1.2-by-5.6-by-6.2 inches. Weighing in at 1.4 pounds, it is the largest of the three units tested. The R-CAT1500 was

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shipped with the optional Akucomp, which provides up to 32 ns. of delay in the red, green, or blue channels to compensate for unequal cable run lengths. As with the R-CAT500, an overall equalization adjustment is provided.

IN USE

When the three units I tested arrived, I was pleasantly surprised at the small size of the box, and how small the individual units were. A wall plug power unit was supplied with each.

The only operating manual supplied was for the R-CAT500; however, Knox Video's Web site has all manuals online for easy access. Once I downloaded manuals for the other units, I found that I needed to set internal jumpers for the type of signal I wished to transmit before proceeding. To ease myself into this project, I decided to use my laptop's VGA output as a source, and to feed the signal through 100 feet of CAT-5e to the receiver, and to display the signal on a 15-inch computer monitor.

I connected the CAT-5e network cable between the T-CAT Universal and the R-CAT500 and inserted the power cord into each unit. I connected the VGA signal to the transmitter, turned on the monitor and then connected the monitor's 15-pin cable to the receiver. I had no display, although moments later, I turned the "skew compensation" knob and the signal appeared on the display. Pretty easy! The quality was excellent, as I could not discern the transmitted computer display from the original.

My next thought was to check the quality over a longer length of cable.

I connected a piece of network cable about 500 feet long between the T-CAT Universal and the R-CAT1500. Once again, I had to adjust the "distance compensation" knob before the picture appeared on the screen. As before, the quality was excellent.

After proving that both units worked well with VGA, I decided to try composite video and stereo audio. For testing purposes, I used a 250-foot length of cable feeding the R-CAT500. This part of the project necessitated finding some additional cabling, as all video inputs to the unit are via the 15-pin connector. I located a 15-pin male cable with BNC breakout connectors, connected the NTSC test signal and reconfigured the jumpers in the transmit unit.

I tried to send composite video into the transmitter, and expected to see the signal on the VGA monitor connected to the receiver. That didn't work, so I called the Knox tech support line. With their help I was able to understand what I'd done wrong. With the pin-out information provided, I constructed another breakout cable allowing the R-CAT500 receiver to connect to a regular composite NTSC video monitor.

After connecting cables and configuring units, I fed an NTSC composite signal to the BNC connector on the transmitter's plug and was pleased to see that this configuration worked nicely There was no visible degradation of video quality.

The next test was to check audio quality. I connected an unbalanced stereo audio signal to the T-CAT Universal's 15-pin connector, and connected an amplifier and speakers to the R-CAT500. The audio quality was excellent. As an additional test, I decided to check the frequency response of the system. Using an NTI "Minirator MR1" test generator, I inserted pink noise into the unbalanced left input, at –20 db and connected a companion NTI "Minilizer ML1" audio analyzer to the left channel output of the R-CAT500.

The analyzer showed that the audio frequency response was flat (within 1 db) from around 20 Hz up to 20 kHz. A quick test of the right channel yielded the same results. I listened for crosstalk in each channel, but heard none.

Quite impressive; although if this technology can deliver high quality analog video, then the audio quality should be equally good

SUMMARY

In my broadcasting career, I've had several projects where I could have used the Knox CAT-5 series. I can imagine many applications for this technology. Overall, the concept is quite innovative and practical. The unit's manufacture appears to be solid, and they're professionally assembled. In addition, the support personnel are responsive and most helpful. These are fine products and Knox appears to be a solid company.

FAST FACTS

Application

Distribution of various types of audio/video over long distances via CAT-5 cable

Key Features

Supports many video formats, ease of operation, scalability

Price

T-CAT Universal, $375; R-CAT500, $525; R-CAT1500, $1,450; plug-in skew option for the R-CAT1500, $449

Contact

Knox Video Technologies
301-840-5805
www.knoxvideo.com

Joey Gill is chief engineer at television station WPSD in Paducah, Ky. He has been with the station for 25 years and has worked in broadcasting since 1977. He may be contacted at respond2jgill @yahoo.com.

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VIDEO CAPTURE CARD

AJA Video Kona 3 Version 2 Capture Card

by Michael Hanish

Quite possibly the Porsche of Macintosh video capture cards, AJA's new Kona 3 Version 2 promises and delivers a level of quality, flexibility, connectivity, and features to satisfy even the most rigorous broadcast and digital cinema applications at an accessible price. The Kona 3 is at the top of a line of superb video I/O cards from AJA Video for both Windows and Macintosh, one of which will undoubtedly meet the needs of any situation and any I/O configuration.

FAST FACTS

Application
Video capture for Macintosh computers

Key Features
Up/down/cross conversion, scaling

Price
$2,990

Contact
AJA Video Systems
530-274-2048
www.aja.com

AJA's new Kona 3 Version 2 capture card

FEATURES

The Kona 3 is a PCI-E card, designed for the Mac G5 and Mac Pro towers. In terms of input and output, it features SD and HD SDI, and dual link HD SDI digital video and eight channels of 96 KHz 24-bit AES and 16-channel embedded digital audio, RS-422 machine control and analog component video output for monitoring purposes. I/O is handled by an attached snake, or through an optional breakout box, which adds analog line level audio output for monitoring. HD component and SD component/composite analog outputs are 12-bit for extremely high quality conversion.

The most significant features of the Kona 3 Version 2 don't have to do with I/O. The board is a hardware-based processing powerhouse, taking care of up/down/cross format conversion and scaling (real-time and hardware based), live HD/SD keying, and hardware acceleration for DVCProHD, HDV and Final Cut Pro's Dynamic RT (real time) Extreme effects. In addition, this newest revision of the Kona 3 adds support for 2K digital cinema resolution files. While only a small percentage of users may need to take advantage of this feature set, its inclusion opens the way for much more affordable digital intermediate and digital cinema play-out.

Basically, this feature set allows 2K telecine files to be played out of the Kona at 2K resolution, with full control over output gamma and even the ability to define and choose a custom look-up table; furthermore, on ingest, 2K DPX and 2K QuickTime reference files are generated, facilitating both an easy interface with other 2K products as well as a simple DI pipeline and easy playout of multi-format edited material. The latest version of the software, Version 3.1, is a Universal Binary (requiring QuickTime 7.1, OS X 10.4, and Final Cut Pro 5.1) and adds a limiter functionality to the setup control panel, limiting video levels to broadcast-legal chrominance and luminance values.

While the Kona's main attractions are hardware, it takes solid control software to make the board such a supremely functional package. The Kona control application is an easy one-stop shop for settings, conversion, scaling, keying, setup and other functionalities. The control panel provides a graphical representation of signal flow through the card, showing currently selected values, with single screen, tabbed panels to adjust all parameters.

A look at the range of some of the controls will give an idea of the Kona's extreme flexibility. For example, the Format tab controls the contents, frame size and frame rate of the buffer at the center of the Kona's processing engine. Supported formats include everything from 525i/29.97 and 625i/25 to 1080p/59.94 and 2K1556/24.

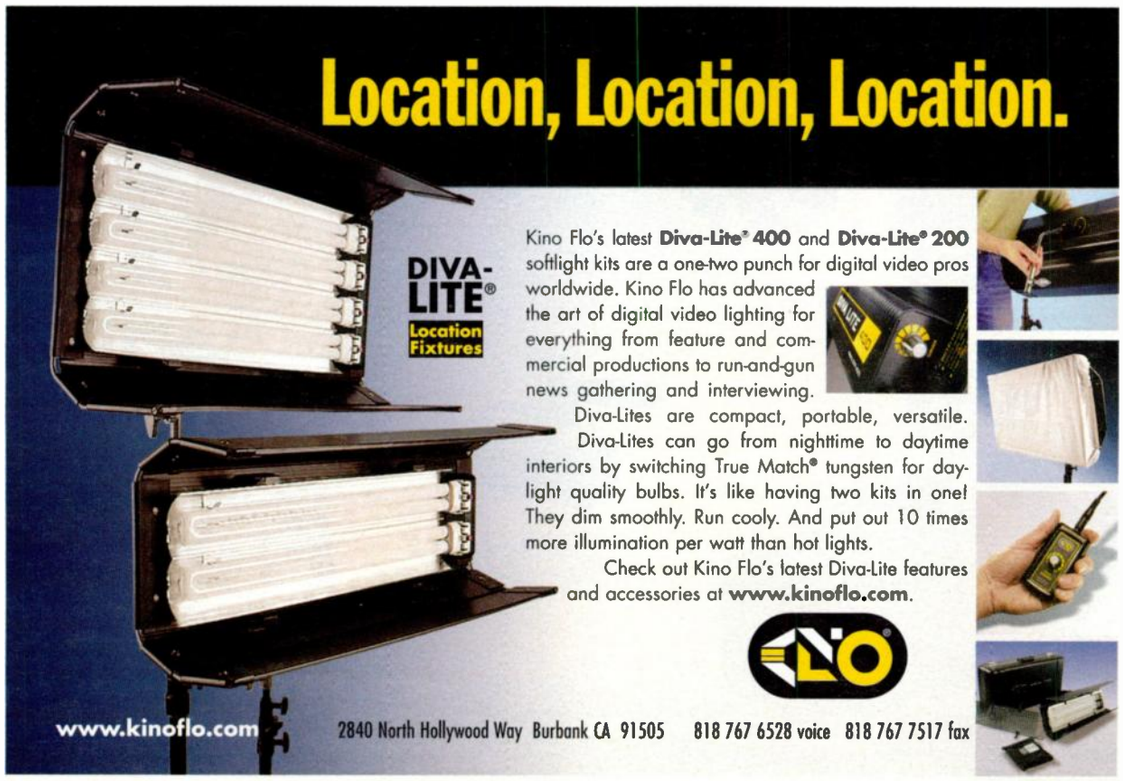
The Kona provides for a primary format, AKA native, and a secondary or converted format, which can be of a same or different resolution. The Kona automatically places the needed up, down, or cross converter in the signal path, and since all conversions are done in hardware, and in real time, the process is transparent, immediate and render-free.

IN USE

Because of its design, integrating and using the Kona in a studio is pretty close to transparent as well. Installation in my G5 took only moments—hooking up the well-marked I/O cables took only a few more moments.

AJA was kind enough to provide me with a tiny HD analog component to HD SDI converter (HD-10A) for purposes of this review and for input to the SDI only board. I connected the RS-422 cable to my deck, hooked up a Flying Cow AD/DA converter to handle audio I/O with the Kona's AES-EBU ports, and set up the analog component output for monitoring on my broadcast quality monitor. After that, all controls resided in the Kona Control and the operation of the Kona board was transparent.

Changes to format, resolution, out-



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put, scaling, cropping were only a click away, with the new parameters taking effect instantly. I spent quite a while trying a variety of up and down conversions, and couldn't spot any image or motion issues.

I tried a number of actions in FCP that would normally require time-consuming rendering, including playing back HDV and DVCProHD material, and found that, as advertised, the Kona's hardware scaler takes on the task, making more layers possible without rendering and freeing up the G5's processor for more real-time effects.

Real-time keying, also made possible by Kona's hardware, is nothing short of miraculous. A bug or ID, for example, can be keyed live over the contents of Kona's frame buffer, or over live video coming into the system, or over a matte, or vice versa, all with no rendering. Along the same lines, I found that the same hardware engine enables timecode burn-in without rendering new media.

One major workflow issue for many people is the ability to preview work being done (other than the editing program) to a broadcast quality monitor. The Kona Control panel has a clever way to deal with this issue: it tells you what process or application is in charge, and has control over the Kona's output.

The highest priority is Final Cut Pro, followed by other QuickTime applications (After Effects, Motion, combustion, etc.). The second priority is the Mac desktop, with the Kona board creating a second (or third or even fourth) graphic desktop, to which windows can be dragged for preview.

The Control panel allows users to establish how the Kona board behaves when no specific application has control. It can display the last frame from the last application that had control of the board, or pass through a signal that might be present at the board's input, or any of a variety of test signals (bars, multiburst, line sweep and the like), or even a selected graphic file or video black.

In addition, Kona TV, an included utility for playing QuickTime movies directly to the Kona video output, was a quick way to put clips "on-air" without having to launch Final Cut Pro, create a sequence, etc.

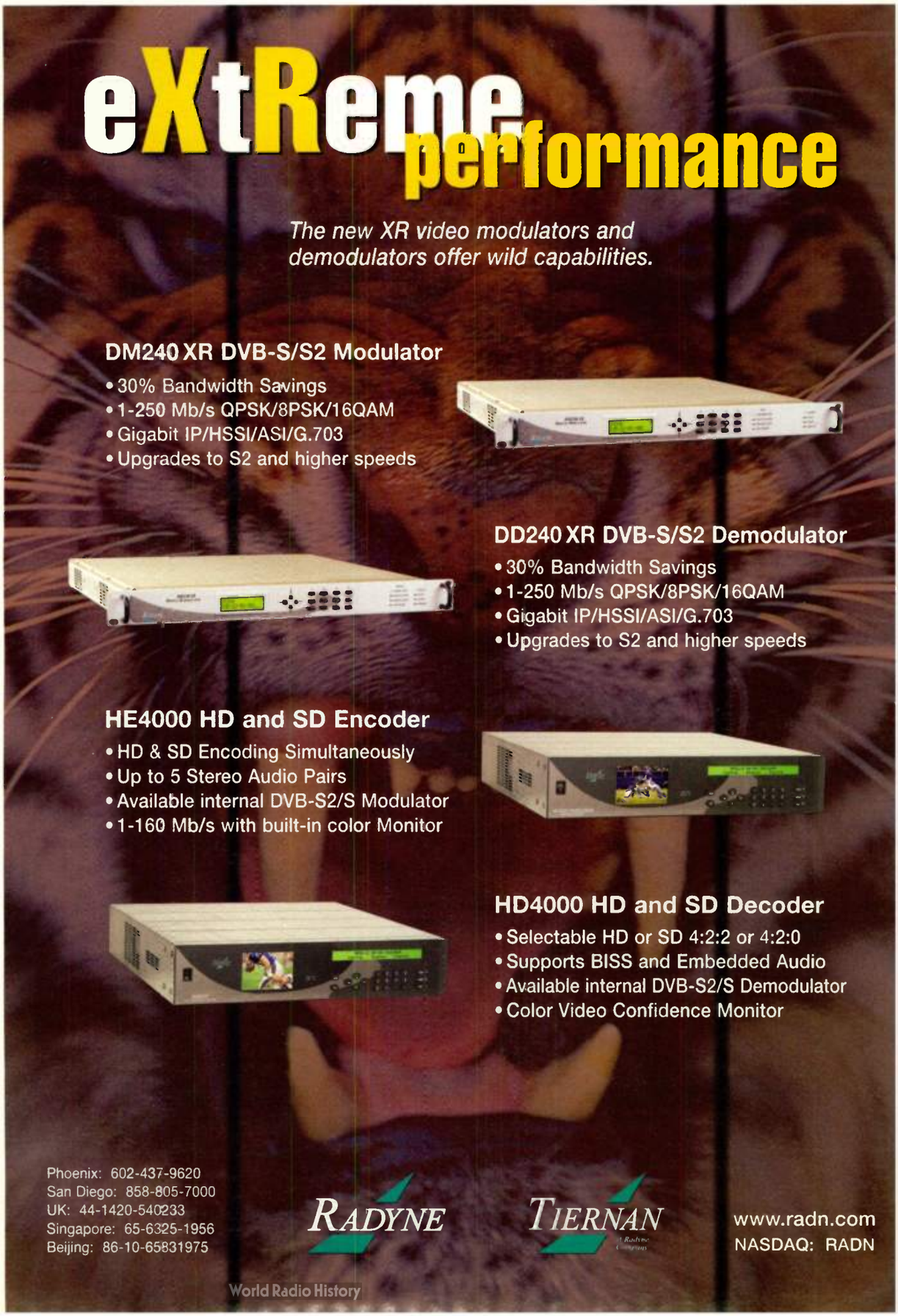
SUMMARY

It was a pleasure to work the Kona 3 into my studio and workflow. The board's output was beautiful, flawless and faithful to input, even with scaling and/or conversion. All of this reminded me that AJA's roots (since 1992) are in making very high quality hardware video converters—AD, DA, scalers—a fact that has had a very positive influence on design philosophy for the Kona card series.

The fact that so much is done in hardware makes the Kona 3 board an incredibly effective addition and advantage for any editing or effects room. The cards become a great supplement to the considerable processing power of today's 64-bit desktop computers, freeing up CPUs to concentrate on more vital tasks. The control software made using the Kona a breeze, no matter the task.

It's worth noting that recently Media100 (for their HD systems), Autodesk (for their high- end Fire, Smoke, Flame, Inferno and other systems) and Avid (for their high-end HD system) all chose AJA boards as OEM components. Windows users will find a parallel line of boards developed for their platform. The bottom line is that anyone seeking to revamp, expand, or just build an editing or effects workstation should give the Kona 3 board a significant evaluation. It provides high performance, and it's cost effective, flexible, easy to use and integrates into any environment.

Michael Hanish runs Free Lunch, a video/audio/multimedia production house near Guilford, Vt. He may be contacted at mhanish@sover.net.



EYE ON EQUIPMENT

Hybrid ENG Vehicles Offer Advantages

by Richard Quiroga

SAN ANTONIO, TEXAS

"Roll out the satellite truck, we've got breaking news!" Those words usually are followed by "But how long will it take to get there and where can we park?" The big satellite trucks were not known for their speed or grace, but were known for getting the job done and being a very expensive specialized tool in your bag of newsgathering tricks.

With formats changing, cameras getting smaller, news departments getting larger and budgets changing like crazy, it can be difficult to justify the expense of a big satellite truck today. Now with the growing popularity of the "hybrid" satellite/ENG truck, more can be done for less. Don't get me wrong, I miss the big truck, but I love the practicality of a hybrid. I put my station's hybrid through Hurricane Katrina last year and we made it out and got the job done.

PAYLOAD RESTRICTIONS

Thinking back, I know if we had a big truck, we could not have reached the areas we did because of fallen power lines, trees and road conditions. Sleeping in your truck for a week allows you to really get to know how a truck should be put together and to make it comfortable and practical for your needs and the needs of your station.

The biggest issue we faced and continue to face is room and payload restrictions. The trucks are heavy and need to be built and packed smart. What does this mean to you as a potential end user?

Things do appear to be changing, according to Steve Williamson with Frontline Communications in Clearwater, Fla.

"In years past, the Frontline NT-7 was the dominant platform for the satellite newsgathering business," he said. "Now, due to lower capital and operating costs combined with advances in DSNG technology that allow more equipment and capabilities to be used in a smaller vehicle, the trend is to use the Sprinter platform for ENG/DSNG and SNV [satellite newsgathering van], both for television station customers and many uplink service customers."

Thomas Jennings, director of sales for Wolf Coach in Auburn, Mass. concurs.

"Wolf Coach has been watching the desire for large trucks diminish over the last several years in favor of hybrid platforms under 10,000 pounds."

Customers at Gerling and Associates in Sunbury, Ohio are also using the Sprinter platform, according to company president Fred Gerling.

"There is a move to smaller SNG trucks, using mostly the Sprinter platform," Gerling said.

G&A is in the process of working a trade-in for a larger 24-foot truck with a 2.4 M dish for two Sprinters with 1.2 M dishes.

"The move is on," Gerling said.

Smaller vehicles mean cost savings and more flexibility for drivers as well, according to Ron Crockett, director of sales and marketing for Shook Mobile Technology in San Antonio, Texas.

"The news industry has definitely shifted from full size satellite uplinks to dual-purpose van-based systems," he said. "These trucks are built on either the Ford E350 or Sprinter 3500 chassis and include both terrestrial M/W and digital Ku band uplinks. The primary reasoning is that the small units are more economical to purchase, cost effective to operate and they can be driven by practically anyone at the station. No commercial driver license is required."

WOAI-TV's new downsized ENG/DSNG van proves that sometimes less can do more.

The transition to COFDM and HD newsgathering are playing a key factor, as news directors, chief engineers and general managers across the country plan for next year's operating budget. Staying ahead of the competition is also important.

"As Wolf moves to the future, we are actively pursuing both HD and IP technologies which will enhance user interfaces, remote controllability and data connectivity never before seen in ENG platforms," Jennings said. "We are also evaluating several power options to replace conventional generators and are drawing off the strengths of L3 [parent company of Wolf Coach] to implement true commercial power solutions instead of using unreliable RV generators.

"The time has come to make the next great leap in ENG/hybrid platforms. Technology is getting lighter, smaller and more powerful. The platforms need to adapt to the changing landscape and become more agile, less expensive and more intuitive to use."

DODGE OR FORD?

The Sprinter series from Dodge is among the most popular platforms right now. It offers a high roof, more than 470 cubic feet of interior volume and Sprinter's common rail direct injection (CDI) turbo diesel engine. Frontline Communications offers the DSNG Sprinter with more than 9,900 pounds of GVWR and a host of options. Shook Mobile Technologies offers the AS13 in a variety of packages.

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LCD VIDEO MONITOR

CoolTouch RX-563AL LCD Color Monitor

by Joey Gill

One of the constants in both DTV and analog TV worlds is the need to view a picture. Although CRT displays are still widely accepted and are very common in the professional video world, other technologies are emerging and gaining wide acceptance. LCD monitors are competing heavily for leadership in display technology, trying to displace CRTs. LCD technology has improved greatly over the last decade, and the displays continue to improve.

One manufacturer who is successfully developing and marketing high quality LCD monitor solutions is CoolTouch Monitors in Los Gatos, Calif.

FEATURES

The CoolTouch monitor shipped to me for evaluation was an RX-563AL. It is a rack-mountable, triple display, 5.6-inch color NTSC device. The unit weighed in at about five pounds, and is 18.5-by-5.1-by 2.1 inches. The actual screen size is 4.54-by-3.44 inches. Screen type is TFT-LCD (thin film transistor, liquid crystal display).

The aspect ratio is 4:3, and the dot pitch is 0.116-by-0.348 mm. The unit is shipped with a 12 VDC power supply that provides three amps. The monitor is available in red, gold, blue, silver and black and accepts composite NTSC and PAL video, with auto-recognition. Each display has two video inputs, but only a single audio input. This is not mono, just one channel of audio available with each screen. According to the manufacturer, the audio monitor is only intended to be for confidence purposes and as such is provided with very limited quality. CoolTouch indicates that later models will enjoy enhanced audio features.

There are three screens, with operating controls below each. The controls include a power switch, an input selecor, a menu button and up and down scroll-type buttons. There's also a small speaker opening.

The CoolTouch RX-563AL three-unit LCD video monitor

FAST FACTS

Application
Video and audio confidence monitoring in limited space and other areas

Key Features
Compact design, supports multiple video formats, ease of operation, latest LCD technology

Price
As tested, $1,499; $1,349 without loop-through

Contact
CoolTouch Monitors LLC
310-923-1354
www.cooltouchmonitors.com

On the rear of the unit you will find the power connector, four input and output BNC connectors for each screen (channels A and B, plus loop-through), a toggle switch to select internal 75-ohm termination for each of the video inputs, an 1/8-inch mini audio jack for each monitor and very good labeling for each connector, switch and jack.

Viewing angle has always been one of the limitations of LCD technology; however, the CoolTouch unit appears to be as good as any I've seen. The viewing angle for the top is 30 degrees, and the viewing angle for the bottom is 10 degrees. Left to right acceptable viewing is 90 degrees. To aid in connection with limited viewing angles, some manufacturers have added mechanisms that allow their displays to tilt up and down.

The CoolTouch unit has a very slick mechanism that allows users to easily adjust the display's tilt in the rack. However, there are no buttons to push or screws to loosen to change the angle. The monitor will stay where you put it due to the "ball-detent" system designed into it. The unit's workmanship appears to be top quality. The anodized finish is very appealing; the power connector screws on for security; and the overall metal fit and finish are outstanding.

IN USE

The RX-563AL came packaged in a very nice shipping container, with a solid packing structure.

I set the unit up on my workbench, connected the power supply and supplied NTSC signals to each of the three monitor inputs. The 75-ohm terminating switches worked perfectly, allowing either loop-out or termination of the signal at each on the monitor inputs. When I pressed the power switch, the monitors immediately displayed the sources that feeding each. The video quality was very acceptable, with the displays bright and vibrant. With the high-contrast display, detail did not appear to suffer, although these are not sold as high-resolution monitors.

With all three monitors in operation, the power supply ran at a comfortable temperature and showed no signs of overheating.

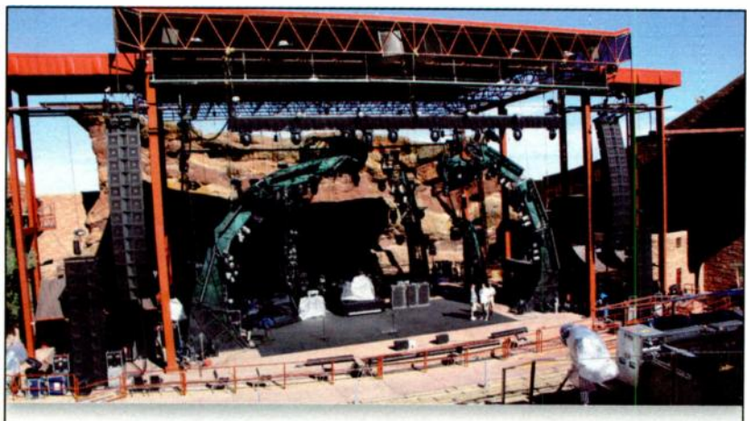
The display is equipped with ventilation holes in the top and bottom of the enclosure and after some hours of operation you can feel some heat being vented through the top. In a clever design move, the top and bottom of the chassis is beveled to allow close mounting without restricting air flow needed for proper cooling. I would still exercise caution with regard to mounting, so as not to restrict air flow, however.

The input selector switch easily toggles between the A and the B sources available to each display. There's even an on-screen display indicating which input is selected.

The menu button provides scrolling through brightness, contrast, chroma and hue adjustments. After selecting which variable to adjust, you just press the up or down buttons, indicated by up and down arrows. The up and down buttons default to volume controls when menu selections aren't being used.

As there's only one audio input per display screen, the audio source heard is the same source whether you select either the A or B input. I used my station's regular audio feed as an audio source during the evaluation of the RX-563AL. Just as CoolTouch indi-

COOLTOUCH, PAGE 58



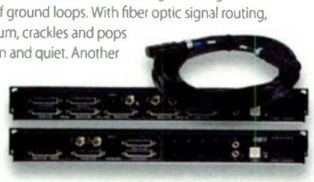
LightViper In The Real World

Katrina Relief Concert • Red Rocks Amphitheater, CO • Production by HD Roadie, LLC

September 2005: Hours after Hurricane Katrina ravaged the Gulf Coast, a benefit concert was scheduled into Red Rocks to provide much needed funds for the victims of America's worst natural disaster. One of the world's top bands was enlisted and the event was recorded in HD. LightViper over-nighted two VIS-4832 bi-directional fiber-optic AES-3 digital audio snake systems (64-channels) to production company HD Roadie, LLC.

Jim Wolande, Chief Operating Officer, HD Roadie, LLC: "The LightViper performed flawlessly. All our cameras are on fiber so why not all the audio? It takes only a fraction of the normal time allotted to deploy the fiber audio runs. To me, that's as significant as the performance benefits. I can't imagine doing these large, high profile assignments any other way now. I'm very happy with the LightViper technology."

Mike Czaszwicz, Audio Engineer, HD Roadie, LLC: "One of the big advantages of the LightViper is the complete elimination of ground loops. With fiber optic signal routing, the sound is completely isolated from hum, crackles and pops too. This gig's sound was extremely clean and quiet. Another huge advantage to using the 'Viper' system is how easy and fast it was to run 1,200 feet of multi-channel cable up to the stage. I can't begin to tell you how good that is when you're huffing and puffing at 6,000 feet!"



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ENG

CONTINUED FROM PAGE 52

Do your homework to make sure the Sprinter or the also ever-popular Ford E350 hybrids, similar to what I currently work out of, meet the growing demands to do more for less, but keeping safety, reliability and budget restraints on the top of your list.

Take notes, study the trucks on the market and don't be afraid to get the input from your staff; after all this will be their new home away from home.

Getting your staff involved will allow you to build a solid truck that is loaded with the broadcast equipment, cable reels, communication packages and other necessities to cover news or other broadcast applications. The manufacturers are doing their part by using lighter material.

Frontline, for example, installs automotive material versus carpet inside for the wall coverings and LCD monitors to save weight and space, which is now key. Wolf Coach uses lightweight aluminum alloys, titanium and carbon fiber as well as several fiberglass and plastic composites.

ALWAYS PLAN AHEAD

When building out a hybrid, make sure your equipment list has everything you will and think you will need so your generator can be fitted accordingly. Getting the super-sized generator that can power a small city is no longer an option, especially if you plan to carry fuel, cable reels and your luggage.

Height restriction is something we currently face with our larger SNV and ENG trucks, clearing power lines and other obstacles. But with the changing technology and the advent of COFDM, having that 42-foot mast is not always an option and could be one piece of equipment you may no longer need. Frontline recently delivered its next generation ENG/350—combo vehicles with ENG/DSNG, with a combined weight of 8,400 pounds.

"It was the lightest combo van we've ever produced," said Williamson. "Those vans did not have a mast. The parabolic antenna, the microwave antenna and the pan and tilt were mounted on top of the rooftop a/c platform. They're in the field and doing fine today."

Changes like that really can make a difference, especially with the handling and safety of the truck.

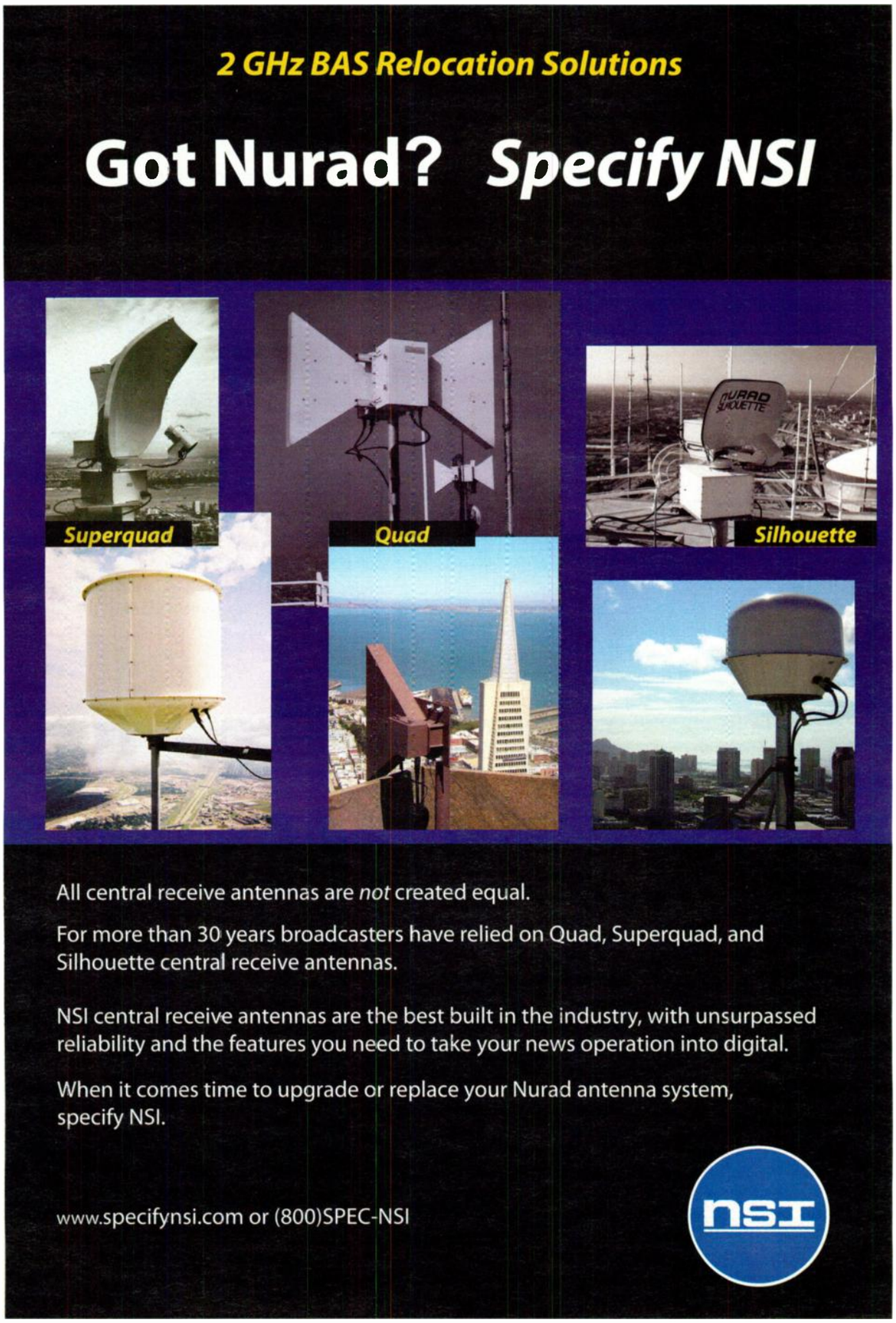
CLOSER IN

Other hybrid advantages include the ability to get closer to the action. Being able to pull up to your location closer than before and not have to run a mile of cable or pull that special parking permit or even having to turn around when you come to a dead end, makes it worthwhile. Using a smaller package has advantages and so do the more traditional larger trucks, but ultimately, your question should be, "What is going to work for me and my operators in the field?"

With an increasing number of manufacturers building these next generation trucks, more and more are going to hit the road. The lower cost of hybrids allows smaller market stations to service a larger coverage area that may not have been an option before. How many times have you been faced with one truck and need to be live at two different spots that are non-microwave accessible?

The bottom line: Will this new truck get the job done for your station and will it meet your day-in and day-out needs? It always brings a smile to my face when I pull up to a scene and the other guys are there with their big SNG truck and I'm there with my ENG/SNV hybrid. But I really smile when I am able to set up faster, pack up faster, go further and deliver amazing video back to the viewer at home.

Richard Quiroga is manager of news operations for Clear Channel's WOAI-TV in San Antonio, Texas.



World Radio History

DIGITAL SIGNAGE

Chyron ChyTV Plus Information Display

by Stephen Murphy

In 2004, the venerable broadcast television graphics system developer, Chyron Corp., broadened its market with the introduction of the ChyTV digital signage system. ChyTV provides standalone dynamic graphics and information display with live video keying/pass-through, and is intended for use on single or multi-unit TV display systems such as those found in governmental facilities, office buildings and commercial establishments.

The ChyTV system consists of a standalone hardware unit that can be programmed, scheduled and updated via computer using included software. Last year, Chyron significantly updated the original composite video-only, molded-plastic ChyTV hardware unit with the new metal-encased, rack-mountable ChyTV Plus system. The new unit provides a number of professional-level video and computer interface features. Included with both hardware versions is the latest release of the ChyTV Tools creation and scheduling software (Version 3.x), which adds a significant number of new creation and scheduling enhancements.

FAST FACTS

Application
Digital signage graphics

Key Features
Rack-mountable, BNC connectors, accepts composite and component video, USB/Ethernet connections

Price
$1,995

Contact
Chyron Corp.
631-845-2000
www.chyron.com

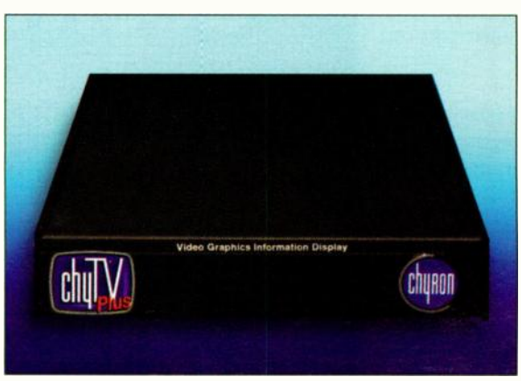
FEATURES

The ChyTV Plus hardware box features a light steel chassis that can sit on a desktop (or a set top), or can be mounted in a standard equipment rack using optional hardware. All audio, video and computer connectors are mounted on the rear of the single rack-space, half-width unit.

Unlike the original ChyTV hardware unit, which has only composite video in/out (on RCA connectors), the ChyTV Plus model boasts composite and component video I/O (all on BNC connectors) and adds S-Video I/O. ChyTV Plus also includes both USB 1.1 and 10/100 Ethernet connections (the original ChyTV is either/or) and adds 9-pin serial control and a GPI interface. The remaining connectors found on the back panel are the stereo audio I/O (RCA) and a power receptacle for connecting the included line-lump style A/C adapter.

The front panel of the unit features a rocker-style power switch and an adjacent three-LED display. The upper LED, confusingly labeled "IN," simply indicates that an A/C adapter is in fact, connected. The second LED, labeled "ON," indicates the status of the power switch, while the last LED, labeled "ACT" indicates when there is read/write activity to/from the memory card inserted in the front-panel Compact Flash slot.

Note that the ChyTV Plus unit uses a specially formatted Compact Flash card for non-volatile storage of system and user files. The system will not function without a card inserted. One CF card is included with the unit, and additional standard CF cards can be formatted for ChyTV by the user.



The Chyron ChyTV Plus digital signage/display unit

The ChyTV Tools software is the interface hub of the ChyTV Plus system. From the application, the user can launch an HTML editor or Microsoft PowerPoint for page creation, manage audio and visual assets, create playlists and page scheduling and transfer playlists and files to/from multiple ChyTV hardware units.

Users can also manage hardware settings of all attached ChyTV units, including video output settings (such as format, NTSC/PAL, brightness and color balance); video input settings (composite/component/S-Video/auto detect, saturation, contrast and hue); and IP addresses.

ChyTV Tools will automatically import and convert PowerPoint slides and HTML pages for use with ChyTV systems. For editing, pages are reopened in their native format in the appropriate external editor, and re-imported/converted when saved.

IN USE

The ChyTV Plus software requires a PC-compatible computer running either Windows 2000 or XP and a 32-bit graphics card. Installation of the system was easy and essentially uneventful—install the software from the CD, connect the hardware unit via a USB cable and turn on, install through the "New Hardware Found" interface. Note that the ChyTV Tools software requires Microsoft .Net 1.1 to be installed.

I fed the hardware box with a variety of sources during the course of the review, including a GPI-controllable composite MPEG player, live TV and corporate promos and other programming through the component output of a DVD player. For display, I used a 50-inch Panasonic plasma monitor, a 45-inch Panasonic LCD monitor and a variety of CRT TVs. The visual image was very good in all cases and I noticed very little degradation of the video throughput. The ChyTV programming can be bypassed (thus defaulting to full-screen video and audio throughput) via the audio, component and S/Composite "bypass" switches. One thing to note is that the unit has a louder-than-expected variable speed fan, the proximity to which over long periods can be quite irritating—equipment room mounting is highly recommended!

World Radio History

Though Chyron announced Version 3.3 of the software in June, the latest version available for download as of September 2006 is Version 3.1.2 (the same version that came on the shipped CD). Some of the improvements and enhancements expected in Version 3.3 can be found in a 3.2 beta release available for download.

After using Version 3.1.2 for some time, I installed the beta release, which contained some significant interface enhancements (such as resizable dividers between sections) and many additional options and choices in the settings and page creation dialogs. I also experienced several lock-ups and other strange behaviors in the earlier version that were not present in the beta release—hopefully the official release of the new software is imminent, as it provided an entirely more enjoyable and bug-free experience.

In general, I was impressed by the ChyTools application. I was able to navigate through nearly all of the page creation, scheduling and uploading processes without cracking the manual, thanks to a highly intuitive icon system, organized screen layout, and an exceptionally easy settings interface. The interface is divided horizontally into two sections, with the local (offline) file listings and scheduling interface above and the hardware unit's (online) respective listings below.

One of the things that I liked most was an incredibly helpful PowerPoint add-on called ChyTV Elements. When a new PP page is created (or an existing page is edited) from within the ChyTV application, PowerPoint is automatically opened, as is the ChyTV Elements interface. Essentially a floating sidebar, the Elements interface displays a button for each of the elements (background, logo etc.) and embedded tags (GPI calls, Active Data references etc.) that one can use on a ChyTV page.

With the Elements interface, new ChyTV-formatted page creation within PowerPoint is a breeze. Buttons included on the Elements interface include Create New Page (which offers a set of basic layouts, which, when one is chosen, open up a variety of predesigned templates), Set Background (color or image file), Video Window (adds video throughput window), Graphics, Crawl, Audio, Text Effect, Clock, Active Data, Logo, FlipBook (animations), and Save/Convert.

Playlist creation and scheduling is drag-and-drop, with the available pages in the project on the left side of the window and the playlist-in-progress on the right. Once pages are placed into the playlist, transitions, display times and scheduling (include/exclude pages based on time and date ranges, specific times and days of the week).

There are a few items that could be improved with the interface, most notably with file handling. The most egregious is the fact that all the elements referenced on a page (image and audio files for instance) need to be manually placed into respective subfolders a few levels into the overall project folder.

As an example, if you use the Elements interface to locate and choose a sound effect or image file from your hard drive to include on a page, you still have to manually locate the file (using My Computer etc.), copy it, open up the Program Files folder on your C: drive, go into the ChyTV Folder and another three or four subfolder branches later, paste the object into a respective Audio or Graphics folder within the current project folder. The fact that it has an interface to find and add a file to a page, yet doesn't do the routine work to place a copy of the item in your project is somewhat baffling.

The ability to easily copy an existing page from one project to another (without having to lookup the names of the files referenced by the page, find them across three or four different subfolders in the old project and place them within their respective subfolders in the new project) would be most welcome. I would also like to see more options regarding audio transitions, such as smooth fades and crossfades. As it is, I experienced pops when files ended or looped (files that otherwise play without pops and loop perfectly).

Working on pages for a 16:9 display proved to be possible, but cumbersome in that all creation work for that format had to be in anticipation of the stretching that would occur on the NTSC output of the hardware box. I wouldn't be surprised if Chyron is working on an HD, 16:9 native version, as this is quickly becoming the prevalent commercially installed display format.

SUMMARY

The ChyTV digital signage/display system provides a number of unique programming and creation features, and the upcoming release of Version 3.3 software promises some significant enhancements to its already intuitive interface. The addition of component and S-Video connectors, plus the inclusion of USB, Ethernet, serial and GPI interfaces makes ChyTV Plus system appropriate for a wide variety of professional applications.

Stephen Murphy is a technical engineer at the National Press Club's Broadcast Operations Center, and an independent video editor/audio engineer with more than 20 years of broadcast and production experience.

World Radio History

CoolTouch

CONTINUED FROM PAGE 54

cates, the audio quality is just about adequate to ensure confidence that audio is indeed present.

By using a tone generator, I determined that the frequency response ranged from about 300 Hz to 10 kHz. Admittedly, this response test was done by ear and has limited technical merit. In addition to the limited response, the volume level was somewhat low. However, both response and volume appear adequate for typical applications of these types of monitors.

SUMMARY

Overall, the RX-563AL is a very appealing unit. I cannot say enough about the design and manufacture of the chassis, not to mention the fact that it makes a pretty nice picture as well. For most applications, the audio application included would be a welcomed addition where space is a concern. The physical space limitations of a compact monitor are going to limit the quality of audio you can expect from such a unit, as there's no room for big speakers on any video monitor in this size range. The audio feature is not an option, and is included with all CoolTouch monitors. I think CoolTouch has done an outstanding job with the design, layout and manufacture of this product and I'm looking forward to the release of more CoolTouch products in the future.

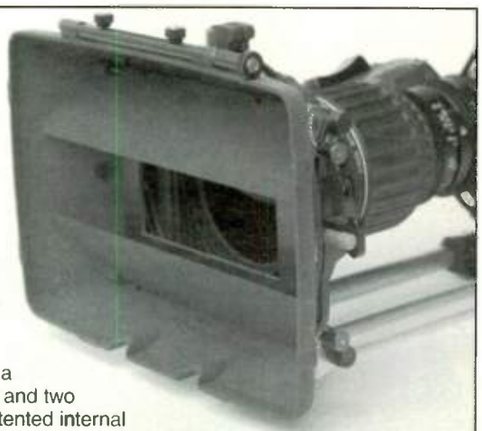
Currently, CoolTouch is working toward producing units that will accept SD and HD SDI and that will support "in-picture" audio level metering and can provide "tally" inputs for customers needing this feature.

Joey Gill is chief engineer at television station WPSD in Paducah, Ky. He has been with the station for 25 years and has worked in broadcasting since 1977. He may be contacted at respond2jgill@yahoo.com.

PRODUCTS & SERVICES
SHOWCASE

Go Wide.

The new MB-350 wide angle mattebox from Vocas features two *independently* rotating filter trays and one non-rotatable horizontal tray. It can accept an additional 4x5.6" filter in the hood for a total of four stages! This fourth stage can also be used with a variety 4:3 or 16:9 mattes.



For lenses wider than 5.0mm the mattebox can use a 4.5x4.5" rotatable filter or one 4x4 non-rotatable filter and two horizontal filters. The patented internal eyebrow system allows the user to adjust the matte or mask to the zoom position of the lens. The MB-350 can be used as a clip-on mattebox or may require the MBS-100 support and bars adapter for use with standard 15mm rails.

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The **Model SDI-900*** is an all digital **Color Corrector/Video Processor** that directly interfaces with the 4:2:2 video at 270 Mbs. (Optional analog inputs and outputs are also available). It features individual control of Red, Blue, Green gains and setups, luminance brightness, high frequency response and gamma. There is no need to navigate a menu, all controls are independent and instantly responsive. The **Model SDI-900*** comes in several versions for additional features. It can have up to 400 memory presets, as well as up to 9 dBs of ramdom noise reduction. Noise reduction is automatic or manual. It's ideal for matching any video feed to any display characteristics and for video pre-processing to maximize compression efficiency. Priced from $1350.

The **Model SDI-313** is a **Universal Transcoder** that converts any analog video format (525/625 lines 50/60 fields/sec) to SDI as well as to any other analog format having the same scanning rates. It also converts a SDI input to any corresponding analog format. List price $1495.

The **Model SDI-333** is a **Universal Analog to SDI Converter.** It converts any analog format (NTSC or PAL scan rates) to SDI. List price $895.

Other SDI products from Xintekvideo include the **SDI-1 SDI to NTSC Converter** ($295), the **SDI-3 Analog to SDI Converter** ($345), the **SDI-10 Noise Reducer** ($1295), the **SDI-110 Professional SDI to Analog Converter** ($895), the **SDI-310 NTSC to SDI Converter** ($995), the **SDI-330 Components to SDI Converter/Noise Reducer** ($1395), the **VP-3000 Pre-Compression Processor with SDI output** ($2995).

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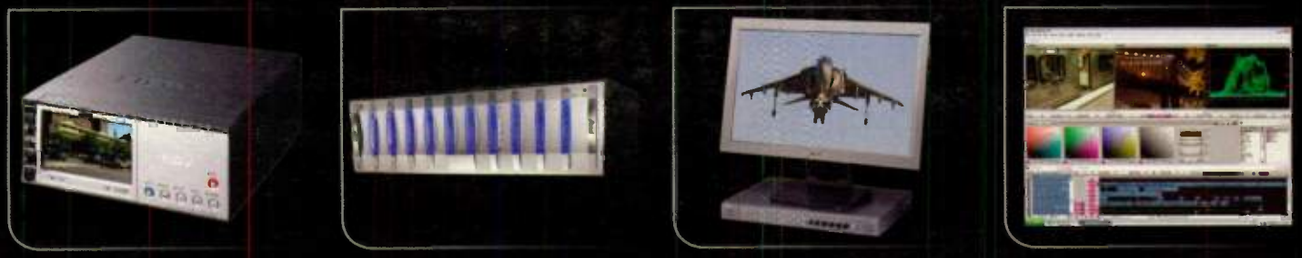

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LED LIGHTING

Gekko K-Lite Portable Daylight Source

by Carl Mrozek

When shooting in HDV, it is absolutely critical to have adequate light, day or night. For many EFP situations, the lighting kit is much the same as for production in any other format. For ENG-style on-camera lighting, however, there is a wrinkle—it simply isn't feasible to tap the standard 7.4 V camcorder batteries to also power a small on-camera light.

Moreover, many lights designed for 2/3-inch and even 1/2-inch CCD cameras make things too top heavy when used with the hotshoe. A lightweight light is necessary to maintain proper camera balance and overall mobility while shooting. LED lighting is one new solution that delivers plenty of foot candles per amp hour of battery life.

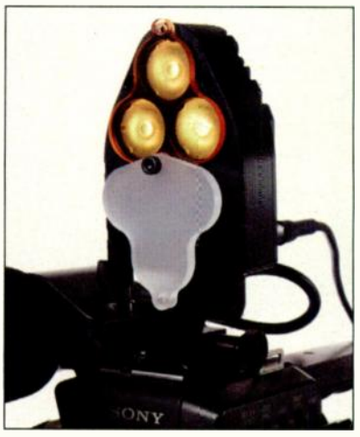
FEATURES

The K-Lite, a camera-mounted LED light, manufactured by Gekko Technology in Kenilworth, U.K. and distributed in North America by VF Gadgets has several impressive features: intensity, coolness, compactness, ruggedness, 6,000 K color temperature and color correction filters.

The K-Lite is a mere four inches high, two inches across and barely an inch deep. It resembles a Christmas-tree-like cell phone, with the three LEDs forming a triangle at its apex.

Two bell-shaped optical filters can be flipped up separately or together to cover the LEDs. One of these is a diffusion filter that cuts light transmission by half. The other is a Mired Shift +81 color conversion filter (Cinegel No. 3408: Roscosun 1/2 CTO) that converts 5,500 K daylight to 3,800 K. It's recommended for use when partial correction is desired, or when daylight is below 4,500 K. It is optically clear with 73 percent transmission.

Both filters are deep-dyed so that they'll work perfectly even if scratched, and both are bolted firmly to the K-Lite to keep them from accidentally slipping, but not so tightly that they can't be readily flipped into use or out of the way.



The Gekko K-Lite LED light source is both compact and easy on batteries.

The K-Lite body pivots 90 degrees forwards and backwards on a short horizontal shaft that swivels on a hinge molded atop its base. The base itself slides snugly into a hotshoe. It can also be mounted to an upright post via a 1/4-inch hole through the base and secured by a hefty thumbscrew. The unit is controlled by a toggle switch on the back left corner, opposite a round dimmer control. This dimmer varies light intensity from zero to 99 percent of full output.

Power is supplied via a port below the power switch, which connects via cable to multiple possible power sources. The K-Lite was designed to function in both the 12 V video and 24 V film worlds, so it works with power sources ranging from 12 to 30 V. A simple, yet elegant, solution is an upconvertor that boosts a single 7.4 V battery to 12 V.

Gekko also makes the 3 DV battery belt which holds three batteries and yields 22.2 V. Any size 7.4 V lithium ion batteries can be used. Battery receptacles are wired in series, hence each must hold a battery, or the circuit is incomplete. With mid-sized or smaller batteries, there is enough space inside the pack to store the compact K-Lite as well.

IN USE

For this review, I received the K-Lite plus the 3 DV battery belt, but no batteries. Luckily I had some Sony NP series lithium ion batteries and a charger. I plugged the power cable into the K-Lite via the Lemo plug and plugged the 4-pin XLR end into 3 DV pack power cable after inserting two fully charged NP batteries.

To my chagrin, nothing happened. However, when I inserted another battery into the open receptacle, the K-Lite lit up and gave me a solid beam of light. I easily adjusted the beam intensity from barely visible to maximum brightness with two fingers. There was ample drag on the dimmer control to prevent accidental changes.

At the same time it rotated easily, but slowly, in both directions, much like the pan axis on a fluid head, with the drag notched up for slow, smooth pans. Another safety feature is the tiny toggle-style power switch, which barely protrudes, making it tough to accidentally trip in handling the light, especially with the power cable plugged in just below it. Moreover, the switch toggled readily, but stiffly between on and off, and readily locked into either position.

The K-Lite slid easily into the hotshoe of the Canon XL H1 and I was able to secure it with a turn of the fastening screw. I was then able to tilt the K-Lite fully 90 degrees forwards and backwards to vary the amount and arc of light on the subject. Unfortunately, the K-Lite does not pivot in the horizontal plane, so the subject should ideally be directly in front of the camera to receive full benefit of the light.

I slipped a thick leather belt into the 3 DV battery pack and strapped it on. Its weight with three medium to large NP series lithium ion batteries was negligible. The main issue was with the power cable dangling from the light. The cable is thin but occasionally interfered when I needed to grab a fast shot.

The K-Lite illuminates quite impressively at full intensity. It draws barely 8 watts, yet the illumination is roughly equivalent to a 30 W tungsten lamp. This is adequate for interviews without supplemental light, even when using the color conversion filter (which reduces illumination by 27 percent).

From my perspective, the foremost application of the native 6,000 K, K-Lite is to supplement ambient daylight lighting. In fact, when operating at full output, the illumination level was sufficient to allow good depth of field when mixed with ambient daylight spilling in through two windows on the dark side

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World Radio History

Gekko

CONTINUED FROM PAGE 60

of a house in late afternoon.

I mounted the K-Lite on the Canon XL H1 and shot a series of scenes indoors where the ambient daylight entering through a bay window several feet away could best be described as dull. My subjects included my brown, beige and white husky, a colorful oriental rug, some landscapes hung on the wall and a mounted partridge. I shot all of these with the camcorder in the auto-balance mode, to enable fast comparisons. In all scenes, the ambient lighting consisted of dull indirect daylight coming through partly curtained windows.

Most of the scenes looked dull or dingy without supplemental lighting. Hence, I compared how they looked with supplemental frontal lighting from the K-Lite, using different filters (or none at all) and with the dimmer set at around 75 percent. At that setting, the actual output was 7.7 watts, slightly less than the illumination from a 30 W tungsten camera light.

Virtually all of the scenes looked acceptable for broadcast with or without filters. Those shot without a filter were distinctly cooler in the highlights, with a slight blue tone overall, but with natural looking colors throughout. The diffusion filter dulled highlights and softened the overall picture, but the color tone remained natural-looking.

As expected, the scene warmed up considerably when switching to the 81-color compensating filter. What I didn't anticipate in several shots was the "film look" that I got when using both the diffusion and color comp filters. In each instance the dual filter combo yielded the warmest, most pleasing look, which I would describe as quite cinematic.

There was a slight, but distinct difference when combining the diffusion and color compensating filters, versus using the color comp filter only, which I would best describe as a softer cinematic look. Quite likely this was a result of a lower *f*-stop, necessitated by the 50 percent reduction in illumination caused by the diffusion filter. Nevertheless, all four options (no filter, color comp only, diffusion, and color comp plus diffusion) yielded well-lit single subjects at relatively close range.

Another experiment dealing with battery life produced some interesting results. I set the dimmer at 50 percent, thus drawing some 6 W from the 3 DV battery belt equipped with three medium-sized NP series camera batteries. These have average capacities of 2.5 hours with a 7.4 V camcorder. Assuming that their individual capacities were additive, they should have been able to power the K-Lite for around seven hours, at the 6 W setting. Based on experience, this seemed improbable, so I put the device to the test. I wanted to simulate typical on/off patterns of use, but was concerned about possible overheating, so the longest continuous period it was used was about two and a half hours. I powered it up and down several times with the batteries in the 3 DV belt. When I totaled the run times before the light shut down, battery life exceeded seven hours—more than enough for a typical day's shooting.

The K-Lite's low current draw shows that a standard NP lithium ion battery or two could provide enough power for typical assignments by using the on-camera power boosters. These Gekko unregulated power units (models LPB and LJB) convert the 7.4 volts from a single NP to the minimum 12 V required by the K-Lite. Unfortunately, neither unit was available for this review.

SUMMARY

Gekko Technology's camera-mounted LED K-Lite is an ultracompact, durable and easily powered sun gun, which delivers white light equivalent to 6,000 K sunlight very efficiently and without generating excessive heat.

The device's light weight makes it a perfect portable lighting solution for today's smaller CCD HD camcorders, as well as for full-sized broadcast cameras. It's compact, yet ruggedly built and ideal for a wide range of pro applications. Moreover, the ability to operate from 12 to 30 volts and the use of several standard connectors provides great flexibility.

Carl Mrozek operates Eagle Eye Media, based in Buffalo, N.Y., which specializes in wildlife and outdoor subjects. Contact him at eagleye@localnet.net.

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14	Autumn Wave LLC	www.autumnwave.comm	36	Marshall Electronics	www.lcdracks.com
5	Avid Technology	www.avid.com	2	Miranda Technologies	www.miranda.com
33	B&H Pro Audio	www.bhproaudio.com	15	Modulation Sciences	www.modsci.com
59	B&H Pro Audio	www.bhproaudio.com	35	Moseley Associates	www.moseleysb.com
27	Bittree, Inc.	www.bittree.com	24	Network Electronics ASA	www.network-electronics.com
57	Broadcast Microwave Services	www.bms-inc.com	55	NSI	www.specifynsi.com
48	Canare Corp of America	www.canare.com	53	Nucomm, Inc.	www.nucomm.com
46	CGS Infographics Automation	www.cgsautomation.com	42	ProMax Systems, Inc.	www.promax.com
47	Cobalt Digital	www.cobaltdigital.com	58	ProSource/BMI	www.prosourceBMI.com
46	Compuvideo Co., Ltd.	www.compuvideo.com	51	Radyne	www.radn.com
31	DAWNco	www.dawnco.com	46	RF Central LLC	www.rfcentral.com
37	DMT USA, Inc.	www.dmtonline.us	58	RF Central LLC	www.rfcentral.com
40	Electronics Research, Inc.	www.eriinc.com	66	Riedel Communications	www.riedel.net
46	Electronika International	www.electronikaine.com	47	RK Enterprises	www.rkenterprises.tv
18	Ensemble Designs	www.ensembledesigns.com	41	Rohde & Schwarz	www.rohde-schwarz.com
47	ESE	www.ese-web.com	17	Sony Broadcast & Professional Group	www.sony.com
67	Evertz Microsystems Ltd.	www.evertz.com	10-11	Sony Broadcast & Professional Group	www.sony.com
54	Fiber Plex	www.lightviper.com	8	StreamBox	www.streambox.com
49	Frezzolini Electronics	www.frezzi.com	12	Studio Technologies	www.studio-tech.com
52	Hamlet Video International Ltd.	www.hamlet.us.com	19	Telecast Fiber Systems, Inc.	www.telecast-fiber.com
68	Harris Broadcast Communications Division	www.harris.com	16	Telemetrics Inc.	www.telemetricsinc.com
60	IDX System Technology	www.idx.tv	13	Thomson/Grass Valley	www.thomsongrassvalley.com
43	Ikegami	www.ikegami.com	20	Thomson/Grass Valley	www.thomsongrassvalley.com
56	Iowa Public TV/Iowa DTV Symposium	www.iptv.org/dtv	7	Troll Technology	www.trollsystems.com
46	JK Audio	www.jkaudio.com	28	VCI	www.vcisolutions.com
34	K5600, Inc.	www.k5600.com	47	Videoframe, Inc.	www.videoframesystems.com
50	Kino Flo Inc.	www.kinoflo.com	30	Will-Burt Co.	www.willburt.com
21	Leader Instruments	www.LeaderUSA.com	58	Xintekvideo, Inc.	www.xintekvideo.com

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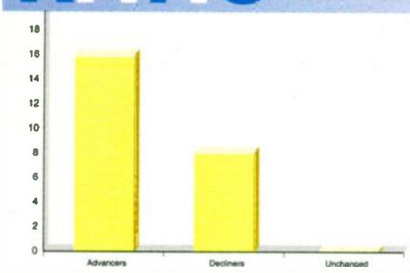

TOP ADVANCERS BROADCAST STOCKS
(Sept. 29 - Oct. 20)

Meredith	+5.86%
Sinclair	+5.35%

TOP DECLINERS BROADCAST STOCKS
(Sept. 29 - Oct. 20)

Nexstar	-6.58%
Ion Media	-3.70%

TOP ADVANCERS TV TECH STOCKS
(Sept. 29 - Oct. 20)

Ciprico	+22.67%
Avid	+8.70%

TOP DECLINERS TV TECH STOCKS
(Sept. 29 - Oct. 20)

SeaChange	-3.04%
Harris	-2.47%

To have your company listed, contact Melissa Sullivan at msullivan@imaspub.com.

TV Tech STOCKS as of October 20

Company Name	52-Week Range	Sept. 29	Oct. 20	% Change
Avid	32.05 - 59.10	36.42	39.59	8.70%
Belden	18.87 - 41.70	38.23	39.77	4.03%
Ciprico	3.68 - 6.84	4.50	5.52	22.67%
Harmonic	3.79 - 7.75	7.36	7.66	4.08%
Harris	37.55 - 49.78	44.49	43.39	-2.47%
LSI Logic	7.41 - 11.81	8.22	8.44	2.68%
Scopus	3.05 - 8.35	3.59	3.64	1.39%
SeaChange	5.81 - 9.89	8.89	8.62	-3.04%
Tektronix	22.64 - 36.89	28.93	30.87	6.71%

Broadcast STOCKS as of October 20

Company Name	52-Week Range	Sept. 29	Oct. 20	% Change
Acme	3.50 - 5.99	5.25	5.18	-1.33%
Belo	14.93 - 23.35	15.81	16.65	5.31%
Entravision	6.59 - 9.18	7.44	7.36	-1.08%
Fisher	38.89 - 49.89	41.55	42.94	3.35%
Gray	5.15 - 10.36	6.41	6.33	-1.25%
Hearst Argyle	19.97 - 24.64	22.95	23.54	2.57%
Nexstar	3.65 - 6.20	3.95	3.69	-6.58%
Lin TV	6.12 - 13.38	7.78	8.08	3.86%
Ion Media	0.37 - 1.15	0.81	0.78	-3.70%
Sinclair	7.18 - 10.07	7.85	8.27	5.35%
Univision	23.78 - 36.67	34.34	35.00	1.92%
Young	1.70 - 3.91	2.30	2.33	1.30%
Tribune	27.09 - 34.28	32.72	32.31	-1.25%
Meredith	45.04 - 56.83	49.33	52.22	5.86%
EW Scripps	40.86 - 51.09	47.93	48.95	2.13%

Crown Castle to Acquire Global Signal

HOUSTON

Crown Castle International Corp., a leading provider of towers to the communications industry, is purchasing Global Signal Inc., a Sarasota, Fla.-based competitor in the tower business, for approximately $4 billion. The transaction makes Crown Castle the nation's largest tower company serving the cellular telephone industry in the top 100 U.S. markets.

Global Signal shareholders will receive 1.61 Crown Castle shares or $55.95 in cash for each Global Signal share. A termination fee of $139 million was set if the deal falls through. The company expects the merger to be completed in Q1 2007.

Prior to the deal, Crown Castle owned, leased or managed more than 11,000 towers in the U.S.; more than 750 are broadcast tower sites. The acquisition will bring the company's total tower portfolio to more than 24,000 wireless sites; 16,240 of those in the top 100 markets. The average price per tower in the transaction is about $542,000, according to Bloomberg.

"The complementary nature of our U.S. portfolios will result in a high-quality, diversified customer base, with 76 percent of site rental revenues from the four largest U.S. wireless carriers," said John P. Kelly, Crown Castle's CEO.

In its most recent quarter, Crown Castle reported sales of $193.8 million, an increase of 13 percent from $168.2 million a year ago. Rental revenue from U.S. sites was up $20.4 million to $154.5 million, compared to $134.1 million in the same quarter in 2005. The company's net loss was down to $13.3 million, or 9 cents a share, compared with a net loss of $225.8 million, or $1.08 a share, a year ago. For Global Signal, revenues increased $44.9 million to $122.5 million for the second quarter, 2006. Net loss was $17.0 million, up from $9.4 million for the same quarter a year ago.

Vitec Buys Autoscript

LONDON

The Vitec Group, a U.K.-based provider of broadcast equipment and services, has agreed to acquire the issued share capital of ALC Broadcast Ltd., the holding company for Broadcast Developments Ltd. and the Autoscript teleprompting businesses (Autoscript Ltd., BDL Autoscript USA Inc., and Autoscript Hire Ltd.).

Autoscript is one of the leading providers of teleprompting hardware and software to the broadcast industry, with subsidiaries in the U.S. and U.K. Vitec acts as distributor for Autoscript in Germany and Italy. The two companies co-developed a Voice-Plus Voice Recognition teleprompting system, which was introduced at NAB2006.

Gareth Rhys Williams, chief executive of Vitec said, "Autoscript is a growing business that we know well which, together with our existing brands, will enhance our position as a leading supplier to the broadcast and video industry."

Sales of Autoscript in the year ended Dec. 31, 2005 were $6.5 million. The acquisition is expected to slightly enhance earnings FY 2007. Vitec said the acquisition would be funded from existing resources.

Michael Accardi, president of Autoscript USA Inc., said the company doesn't anticipate any facility closings or personnel changes.

"We are excited about entering into this agreement and believe that Vitec Group will further strengthen our worldwide position and help us to continue to develop as the leading teleprompting company," said Accardi.

The companies expect the deal to be completed by the end of the year.

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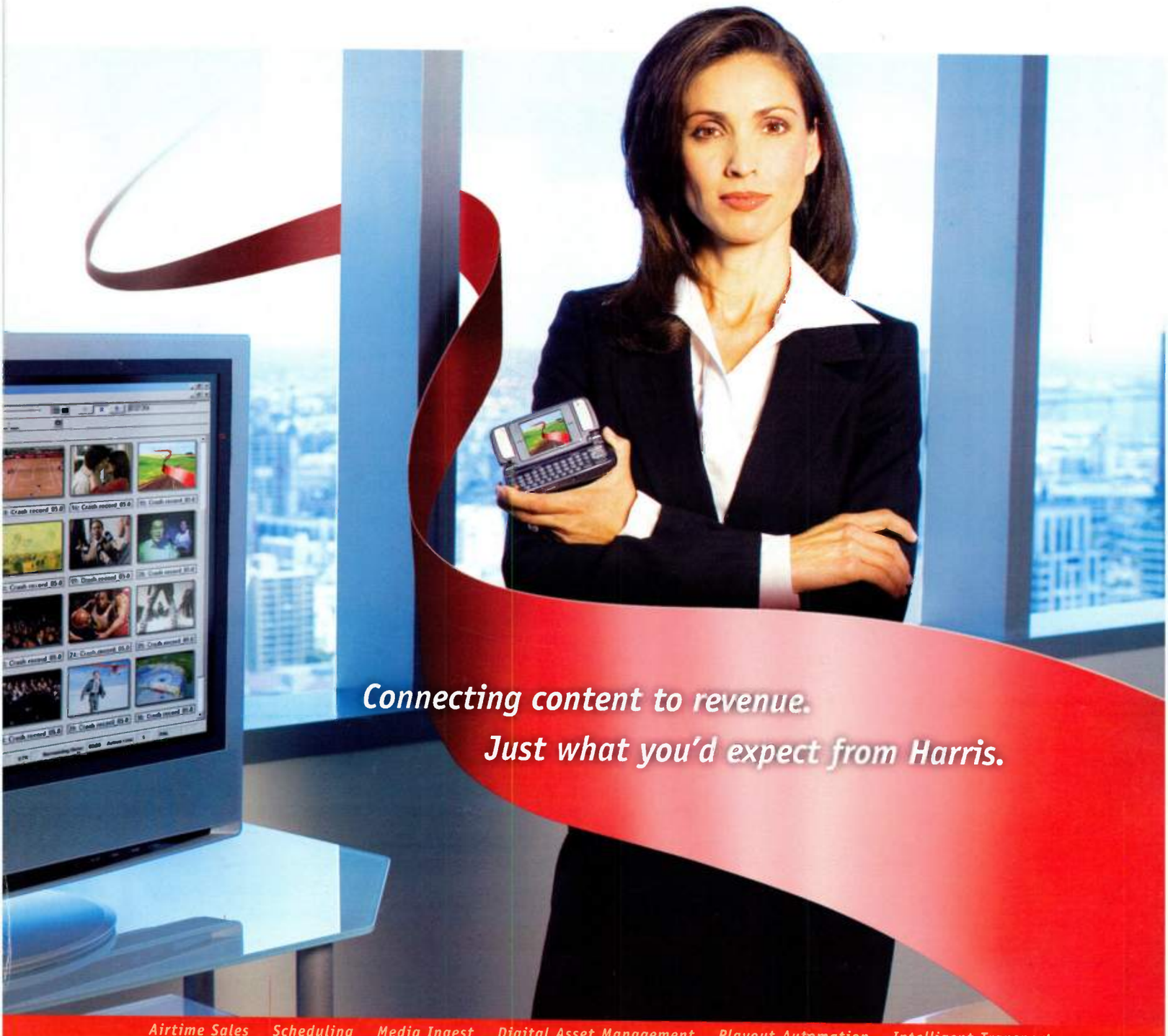

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