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WHAT'S INSIDE

Dueling DTV Bills

Lawmakers vie to end analog TV

by Deborah D. McAdams

WASHINGTON

Ending analog television is becoming the Holy Grail of secondary issues on Capitol Hill. In between judicial appointments, John Bolton, the Patriot Act and the "memo," lawmakers jockeyed to introduce DTV bills.

In the House, draft legislation for a Dec. 31, 2008 date continued to circulate while Sen. John McCain (R-Ariz.) recycled his SAVE LIVES Act, which calls for the analog broadcast spectrum to be *available* as of Jan. 1, 2009. Meanwhile, Senate Commerce Committee Chairman Ted Stevens (R-Alaska) was expected to unveil a DTV bill of his own.

McCain, who has long vilified the broadcast industry, reintroduced SAVE LIVES at a press conference where he linked broadcasters to 9/11 casualties. Because broadcasters failed to turn over their transition spectrum according to schedule, first responders had inadequate communication links on that day, he said.

"Firefighters inside the towers were unable to get transmissions to evacuate the building," McCain said.

In his statement on the Senate floor, he was far more conciliatory.

"I continue to believe that broadcast television is a powerful communications tool and important information source for citi-

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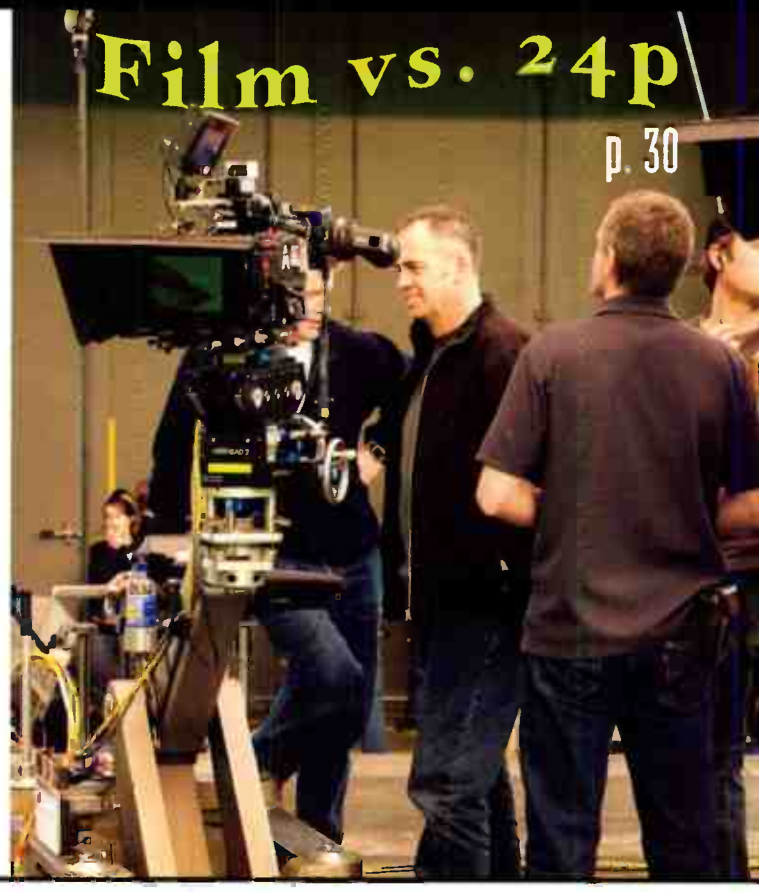

IPTV Atop SuperComm Agenda

Telcos challenge cable on franchise regulations

by Gary Arlen

CHICAGO

Charles Dolan, smiling despite his mega-million losses at the recently shuttered Voom direct broadcast satellite venture, was studying the Internet Protocol Television exhibit at the Scientific-Atlanta booth within the sprawling SuperComm tradeshow in early June.

Ivan Seidenberg, Verizon chairman

"I'm trying to figure out IPTV," the Cablevision Systems mogul said.

In his quest, Dolan was joined by many of the more than 30,000 other SuperComm attendees. IPTV—the competitive video component of the telephone industry's "triple play" (bundled with voice and high-speed data delivery)—was a pervasive factor in dozens of exhibits and countless SuperComm speeches.

For example, Verizon Chairman Ivan Seidenberg, during a briefing after his keynote address, concentrated on his company's video agenda, including a feisty competitive stance against cable TV.

Verizon will carry "significantly more HDTV channels and integrate [services] of TV and PC within a short period of time," Seidenberg said, offering no details about such services. He pointed to the planned video-on-demand channels as delivering "additional gaming and information services."

'INSURGENT' TELCOS

As did many other telephone industry executives here, Seidenberg focused on the regulatory hurdles facing IPTV and telco's moves into video delivery—especially in the wake of a recent Texas regulatory set-back for them. (The state denied Verizon and SBC's quest for a statewide franchise, rather than the locality-based franchises required of cable systems).

Seidenberg characterized as "bizarre" the demands that tele-

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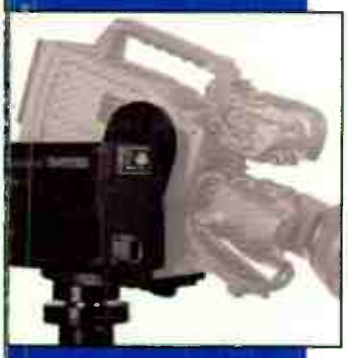

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Digital Rainbow

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Net Soup

FiOS, Verizon's new fiber-to-the-home network, is where Internet rubber meets the television road. Its success—or failure—stands to have huge implications for the direction of American communications throughout the remainder of the decade.... PAGE 29

Karl Paulsen

Media Server Technology

Fibre Channel data rates are about to double—again. This 10-year-old server and storage technology has grown from 1 Gbps to 2 Gbps, and now products are available that bridge the 4 Gbps domain. The impact of these advances on media server storage... PAGE 32

Jerry Whitaker

ATSC Update

The ATSC has begun work on defining the basic parameters for digital electronic newsgathering (D-ENG) communications systems. This work is being done in the Specialist Group on Digital ENG Communications (TSG/S3), under the leadership of Dane Ericksen... PAGE 34

FROM THE EDITOR

The Quest for a Converter Box

Congress and the FCC are moving forward with proposals to formalize a deadline for the analog shutoff that centers around a 2008-2009 time period. Broadcasters are justifiably concerned that regulators will ignore the "85 percent" rule that, up until now, helped ensure that consumers would not be left in the dark when analog broadcasts end. They also don't have much confidence in the consumer electronics industry to provide the converters needed to help viewers transition to a DTV future.

These concerns have led NAB and MSTV to pursue the development of a low-cost digital-to-analog converter box for over-the-air DTV reception. The two organizations hope to have a working prototype available by the end of the year, and anticipate that this prototype will be the working model for future converters.

"A workable, low-cost converter box is vital to the success of the digital transition," said NAB president/CEO Eddie Fritts. MSTV President David Donovan adds that while low cost is important, the converter boxes "must be consumer-friendly and, most importantly, they must work well. Otherwise consumers are likely to reject them."

The proposal comes amid the likely prospect that current pending DTV legislation will include setting aside federal funds to provide low-cost converters to qualified consumers who can't afford the cost of a converter box once analog broadcasts end. Despite the predictable howls from an uninformed general press claiming "broadcast welfare!", the evidence is overwhelming that a solution needs to be found—soon. This is a good first step.

Proposals are now being accepted by MSTV until July 22; the RFP is available by contacting Victor Tawil of MSTV at *vtawil@mstv.org*.

Tom Butts
Editor
tbutts@imaspub.com

Correction

On p. 146 of the May 25, 2005 issue, it was erroneously reported that Thales Broadcast displayed its DCX Millennium transmitter. The transmitter was actually the DCX Paragon MSDC-IOT, which lowers cost of ownership through the use of Thales' patented Soft Arc technology. Thales also displayed its Ultimate/Optimum solid-state liquid-cooled transmitter, which features an architecture that is upgradeable from NTSC to DTV.

The company also demonstrated its SmartCast Mobility end-to-end solution for delivering video content via the DVB-H standard.

LETTERS

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

Compression Artifacts

Dear Mario:

Regarding your Feb. 16 article ("Numbers Fingers, Toes and Quality"), thanks again for the perspective. I don't know if you've ever tried to watch DirecTV, Dish network, or Comcast Digital cable, but if you have, you may have wanted to quit producing television. Why care what your image looks like when it's going to be horribly mutilated by massive compression artifacts? Compression artifacts in non-broadcast TV pictures are so out of control right now I can hardly believe this can be called "progress". Even analog cable has a ton of noticeable compression artifacts just from the digital transmission to the carrier... and then that "digital quality picture" from the digital provider has compression artifacts on top of compression artifacts.

But hey, at least they can offer 100 pay per view movies at a time, right? How is it that we're supposed to care about HD when SD is getting worse and worse and nobody cares about that?

James Norbeck
Brightwood, Ore.

Mario replies:

Amen!

Your pal,
Mario

Who Cares? We Do!

Dear Mario:

I'm writing in response to your Jan. 19 column ("Survey Says: We Don't Care About HDTV").

One thing you failed to grasp is that while approximately 43 percent of people still intend to probably buy another SD TV, it doesn't mean these people do not intend to or have not already purchased an HDTV.

I am a person that intends to purchase another SD TV in the future (one to replace the 15 year-old set in my bedroom.) But I'm also the owner of two HDTVs (in my living room and study.)

My father is an owner of an HDTV. He'll probably stick with the one in his living room but if the SD CRT goes out in his bedroom I doubt he's going to spend $1K for a direct view CRT HDTV and he 'shirley' isn't going to put a RPTV in his bedroom.

I'd say you missed the fact that while much of the public intends to purchase another SD TV before it's all said and done, that many of these same people are also embracing HDTV.

Chad Courtney
Stafford, Texas

Mario replies:

Hey, congratulations on your purchases.

Let me put this another way: From the beginning of time to the end of 2004, factories sent only about 10 million HDTV displays to the U.S. Since you've got two of them (and so do a bunch of other HD enthusiasts), and since a bunch of them are still in stores, and some are in TV stations or studios, just what percentage of American homes do you think has HD nine years after the first U.S. digital-TV broadcast stations went on the air?

The HD-heavy Voom satellite service went out of business. Sure, there are some HD enthusiasts; Voom had about 25,000 subscribers. But, if everyone loved HD as much as you, don't you think they could have had a business?

Your pal,
Mario

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Bills

CONTINUED FROM PAGE 1

zens," he said. "I know that on 9/11, I learned about the attack on the Twin Towers and the Pentagon like most Americans—by watching television. Therefore, this bill seeks to not only protect citizens' safety, but also the distribution of broadcast television."

SAVE LIVES ("Spectrum Availability for Emergency-Response and Law-Enforcement To Improve Vital Emergency Services") was introduced in the 108th Congress where it was quickly derailed.

The new version, S.1237, includes DTV provisions covering public education, warning labels and digital-to-analog converter subsidies.

The House draft, which had yet to achieve bill status at press time, made no mention of providing a subsidy for converters, an issue that divided members of the House Commerce Committee.

"It's unacceptable that we have no plan to remedy consumers," said Ed Markey, (D-Mass.) at a committee hearing on the draft.

Joe Barton, (R.-Texas), committee chairman, said he would support a limited subsidy, while Cliff Stearns, (R-Fla.), said he was "not convinced a subsidy is necessary."

BUDGETING FOR BOXES

McCain's bill includes a converter subsidy of around $463 million—the amount necessary to cover the 9.3 million households that do not exceed twice the poverty level, according to the Government Accounting Office.

The original version of the bill set aside $1 billion for converter-box subsidies from spectrum auction proceeds—the subject of wildly fluctuating projections.

Aside from the uncertainty of how much money spectrum auctions will raise, no one knows for sure how many people rely exclusively on over-the-air television, or how many of them will have digital TV receivers by 2009.

At a hearing on the house draft bill, Consumer Electronics Association chief Gary Shapiro testified that "including set-top boxes, by 2009 we will have sold 97 million DTV tuners, and we estimate that over-the-air tuners will be found in 86 percent of American homes."

Two weeks after the hearing, the FCC goosed the dissemination of digital broadcast (ATSC) tuners by making manufacturers put them in TVs sooner than previously required.

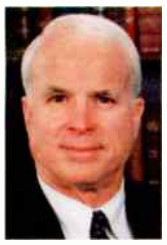
All large and mid-sized TVs shipped for sale in the United States will have to include ATSC circuitry by March 1, 2006.

(The tuner requirement does not apply to products that are "monitor only;" but to TVs that otherwise have analog broadcast reception capability.)

The FCC's original tuner mandate required that half of 25- to 35-inch sets include tuners by July 1; and that 100 percent have them by July 1, 2006.

The CEA asked to have the halfway point dropped in exchange for moving up the 100-percent deadline by four months. Instead, the FCC kept the 50-percent deadline *and* moved the 100-percent date up four months.

The commission also opened a Further Notice of Proposed Rulemaking to move the final deadline for smaller sets—13 inches and larger—up by six months, from July 1, 2007, to Dec. 31, 2006. The notice also asked for comments about whether a tuner requirement should be extended to sets with screens smaller than 13 inches.



"I know that on 9/11, I learned about the attack on the Twin Towers and the Pentagon like most Americans—by watching television."

—Sen. John McCain's statement on the Senate floor, after connecting broadcasters to 9/11 fatalities during a press conference

CONSEQUENTIAL COSTS

The CEA wanted the halfway point on mid-sized sets ditched because it said the ATSC price premium drove away retailers, who are not subject to the FCC rule. The cost of putting ATSC circuitry into a TV set is around $80 to $100, which translates into about $300 retail, according to an analysis of current market prices.

A $300 price differential for sets that look identical has led to a strong market for analog TVs, which outsell the digital/direct-view LCD/plasma category by about 4 to 1.

As of July 1, 2004, half of sets 36 inches and larger had to include ATSC reception. Eight months later, ATSC-capable sets in that size category comprised less than one-third of what reached showroom floors, according to a survey of ads in major metropolitan newspapers tracked by New York-based TV expert Mark Schubin.

From March 28 through June 3, of 1,237 ads for TVs 36 inches and larger, 387—31 percent—included ATSC tuners.

Those larger sets account for about 18 percent of sales to dealers, while the mid-sized category accounts for about 40 percent. Thus, CEA members fear being left with warehouses full of mid-sized ATSC sets.

At least one consumer electronics manufacturer embraced the FCC action. TTE, the TV-making joint venture of Thomson and Chinese appliance giant TCL Corp., is in the process of rolling out a line of low-priced ($400) standard-def DTVs. Greg Bosler, executive vice president of the TTE North America Profit Center, said TTE was "eager" to complete the DTV transition and sell more of the cheaper sets. A $300 27-inch model, demonstrated on Capitol Hill in May, is due to hit the market later this year.

RESPONSE

The NAB was quite keen on the tuner decision, having endured a recent barrage of CEA flack over just how many households rely on broadcast television. In turn, NAB members have persistently complained that it's wrong to force an analog shut-off when manufacturers continue to flood the market with analog TVs, regardless of how many Americans rely on broadcast television.

"We salute Chairman Martin and other FCC commissioners for accelerating the original tuner schedule," said NAB President and CEO Eddie Fritts, "and we strongly support the proposal to move up DTV tuner compliance for smaller TV sets."

Fritts also issued a gingerly worded statement following McCain's scathing press conference.

"As former Homeland Security Director Tom Ridge has noted, local television stations provide a lifeline service during terrorist attacks, hurricanes, tornadoes and other natural disasters," he said. "We are committed to completing the digital transition in a timely fashion including return of analog spectrum, and will work with Congress to ensure that millions of consumers are not left stranded by a premature end to analog broadcasting."

POLITICS PENDING

The antagonism between the NAB and McCain intensified last year when SAVE LIVES got shot down in the final hours of the Senate. The bill was essentially dismantled by an amendment from Sen. Conrad Burns (R-Mont.) that allowed the FCC to waive the deadline "to the extent necessary to avoid consumer disruption."

Chairman Stevens, who succeeded McCain as head of the Commerce Committee, supported the Burns amendment, as did Sen. Daniel Inouye, (D-Hawaii), who is now co-chairman.

Stevens was also the special guest at a mid-June fund-raiser for Burns, a former broadcaster who has often defended the industry on Capitol Hill. At press time, Stevens was expected to unveil his own analog deadline bill at any time, prompting reporters at McCain's press conference to ask why he simply didn't wait for that bill.

"Just because I'm not chairman of the Senate Commerce Committee doesn't mean I won't act," McCain said. ■

Charles "Chuck" Sherman Dead at 71

Former NAB Executive Vice President of Television Dr. Charles E. Sherman died on June 18 in Philadelphia after a long illness. He was 71. Services were held at the Levine and Sons Memorial Chapel outside of Philadelphia, and interment was at Shalom Memorial Park in Philadelphia.

Dr. Sherman began his affiliation with NAB in 1988 after a distinguished career in broadcasting that included service as general manager of WHOI-TV, Peoria, Ill. and WTRF-TV, Wheeling, W.V. He was past president of the Broadcast Education Association. Prior to entering the television business, Sherman's career was in academics. He was professor and associate chairman of the Department of Communication Arts at the University of Wisconsin-Madison and professor and chairman at the Department of Telecommunications at Indiana University.

At NAB, Dr. Sherman was Executive Vice President, Television until 2002 and served as President of the NAB Educational Foundation (NABEF) until 2004. He was credited with establishing numerous initiatives including the Service to America Summit that recognizes outstanding public service contributions of local radio and television stations. He founded the "100 Plus" conference that focuses on small and medium market television. Under his leadership, NABEF instituted the Broadcast Leadership Training program that provides advanced training of minorities and women in senior broadcast management. It was his vision that forged a partnership with Howard University in Washington, DC in establishing the NAB/Howard University Media Sales Institute.

In 2003 the NAB established a national award entitled the "Chuck Sherman Television Leadership Award" which recognizes leadership, service and commitment to local television in medium and smaller markets.

Dr. Sherman is survived by his wife Elaine, two sons and a daughter, and four grandchildren.

"Chuck Sherman was 'Mr. Television' at NAB for nearly 15 years," said NAB President and CEO Eddie Fritts. "The NAB family extends our condolences to Elaine and entire Sherman family."

Contributions in remembrance can be made to the Charles and Elaine Sherman Lectureship Series at Temple University.

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Helge Blucher
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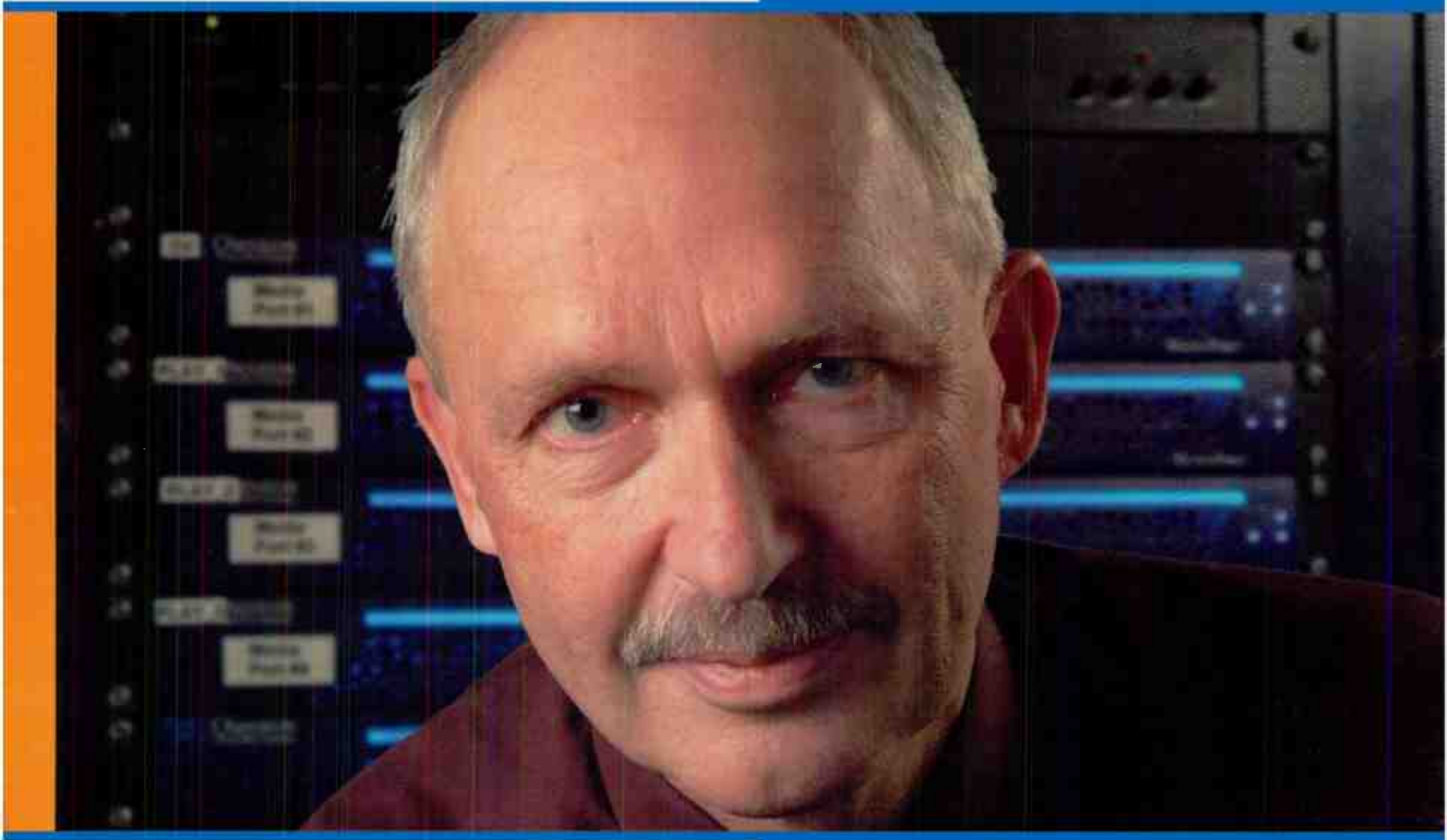

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TV Signals Used for Geo-Positioning

Rosum technology uses TV RF as alternative to GPS

by Mary C. Gruszka

REDWOOD CITY, CALIF.

TV signals can go where no GPS transmission has gone before, like inside buildings or deep into urban geography. And that makes them attractive for terrestrial-based radio location-positioning systems, as an alternative to GPS or complementary to the satellite based system.

At least two entities, Rosum Corp. of Redwood City, Calif., and Communications Research Centre Canada (CRC), of Ottawa, Ontario, have been investigating methods to take advantage of the existing cadre of thousands of TV transmissions.

Rosum already has radio positioning infrastructure in four metropolitan areas: San Francisco and the Bay Area, Washington, D.C., parts of Virginia and Maryland, greater New York City (the five boroughs, parts of Connecticut and New Jersey), and Sacramento, Calif.

"This covers about 11 percent of the country," said Jon Metzler, director of business development for Rosum.

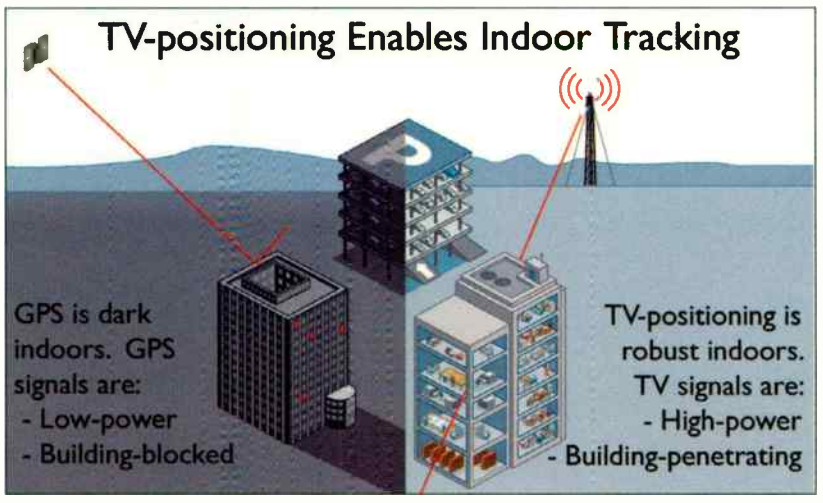
PUTTING THEORY INTO PRACTICE

So far the installations have been used for demonstrations, but the technology will soon find a practical application, incorporated into Trimble's newest version of its TrimTrac locator system. Trimble, a Sunnyvale Calif.-based company that has produced a variety of GPS based products for more than 20 years, will add radio positioning via TV signals to its GPS tracking system for enterprise-wide automobile fleets.

"The Trimble system will be a hybrid of TV and GPS. They are very complementary," Metzler said. "Our system will help Trimble extend its reach to parking lots, chop shops, and the like, since GPS doesn't work inside."

The Rosum system employs a distance measuring technique known as "multilateration," where signals from three or more transmitter sites, with known fixed coordinates, are measured by a remote device (the device being tracked). Distances to each transmitter site are then calculated, simultaneous equations are solved, and the location of the remote device is then determined. (The Rosum system, technically speaking, does not use triangulation where angles, rather than distances, to transmission sources are determined.)

The receiving device, as installed in a car, for example, is pre-programmed to sequentially scan for a certain set of unique frequencies appropriate for the city of operation. Looking at multiple TV signals ensures redundancy in cases of multipath, or if some of the expected signals are not present at all.



Rosum technology uses the robust high-power advantages of television broadcast signals to overcome the disadvantages of GPS.

"For digital, we are looking for the field segment sync signal, and for analog we are looking for the ghost cancelling reference," Metzler said. "We don't demodulate the signal. We don't care what is on the broadcast. Because we aren't demodulating the picture, we can dig below power levels you'd need to see a picture."

The information gathered at the receiver is not actually processed in the receiver. Rather it is sent via a wireless connection to the Internet to a server that performs the necessary calculations to determine time of travel of each signal, and then the corresponding distance. Stored in the server are the coordinates for each transmission site.

"We clock at what time the signal left the transmitter and clock at what time the signal arrived at the receiver in the mobile device," Metzler said.

What Metzler would not reveal was just how Rosum calculates this signal travel time, saying that's the "special sauce" or trade secret of its system. If that's all the system did, it would not be very accurate because TV signals are not locked to a known time reference. That's why the current, or "phase one" implementation of the Rosum system includes additional receivers at fixed locations which are timed to GPS. "The receivers are small PCs about the size of a construction lunchbox," Metzler said. "Each has two antennas, one for TV and one for GPS."

The receivers are strategically located in each coverage area. "There are three monitors in Washington, D.C., and four in New York," Metzler said. The receivers scan the same frequencies as the mobile device and forward that data, as well as the GPS time stamps of when the signals were actually received, to the server. The server uses this information to calculate the timing offset used to make corrections in calculated transmission travel time of signals received by the mobile device.

Results of tests performed by Rosum indicate that radio location via TV meets or exceeds the FCC benchmark for location tracking for cell phones, i.e. 50 meters, 67 percent of the time, according to Metzler.

For the Trimble project, Rosum is providing a module for the Trimble TrimTrac receiver. The Trimble device is about the size of a large PDA, and is non-evasively installed in the glove compartment of a car. Also included from Rosum are the monitors, server, and other hardware and software, and the "know-how," as Metzler put it.

Phase One "is useful for systems for today, but it's not necessarily what could be used in the future," Metzler said.

ON TO PHASE TWO

In what Rosum refers to as "Phase Two," the monitor would be eliminated if a stable clock reference was added to each TV transmission. Metzler estimated that the cost per transmitter would be around $5,000, and that the clock signal would have no effect on the broadcast content.

But who would pay? "We'll look for homeland security to pay for it," Metzler said. He added that this amount would be less than the annual maintenance cost of the GPS system.

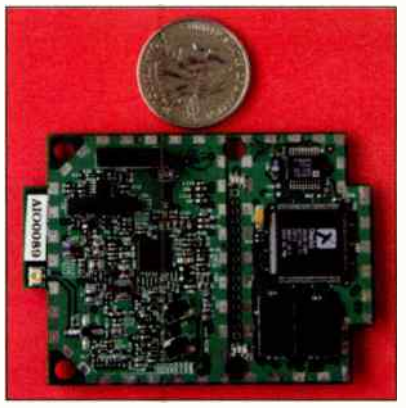
Another emerging technology could also be used to provide a stable reference, the RF watermark or transmitter ID signal making its way through the ATSC standardization process. (Candidate Standard CS/110A for the identification and synchronization of distributed TV transmitters).

The RF watermark was originally developed for synchronizing multiple 8-VSB transmitters, and identifying a particular transmission. It is a low-bitrate spread spectrum signal that is more robust than DTV, according to Yiyan Wu of the Communications Research Centre Canada. "This data is good for emergency alert systems," Wu said. "Even in places that can't receive a DTV signal, it can still receive the transmitter ID sequence. The RF watermark can provide the same function as the DTV field sync [in the Rosum system]. These are complementary to each other."

Wu added that transmitter manufacturers are starting to build systems that can insert the transmitter ID sequence. Wu has met with executives from Rosum.

Dr. Jim Omura, chief scientist at Rosum, had this to say about the RF watermark: "Part of this system includes the embedded pseudorandom noise sequences that are ideal for the robust unique identification of TV transmitters and for sending low rate data that is extremely reliable and can be received at extremely low signal levels. These embedded pseudorandom noise sequences can be employed in both geolocation using ambient TV signals and by Rosum's self-contained positioning system, resulting in a very robust position location system."

Yet another enhancement to the system would be possible when analog TV channels are retired and made available for other uses. One of these uses could



The Rosum TV-GPS chip

be supplemental transmitters, which Rosum calls "Pseudo-TV Transmitters," to achieve greater positional accuracy. These transmitters could produce a regular TV signal or a specialized signal at lower power. Metzler said that the specialized signal could be tailored to be resistant to jamming, something that GPS is susceptible to, and be applied to targeted areas, like spot coverage of a specific building.

But that is in the future. For the present, Rosum has responded to the Presidential Decision Directive of Dec. 8, 2004 regarding U.S. Space-based Positioning, Navigation and Timing Policy that "establishes guidance and implementation actions for space-based positioning, navigation, and timing programs, augmentations, and activities for U.S. national and homeland security, civil, scientific, and commercial purposes."

"Who will be the champion on the behalf of the government?" Metzler asked rhetorically. Rosum is putting forth itself and its technology to be just that. ■

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And Then There Were Four

Competition heats up in robotics

by Craig Johnston

SEATTLE

In studio robotics' first heyday, nearly two decades ago, there were four major players: Radamec, Telemetrics, TSM and Vinten. But through consolidation, only two of those companies survived: Vinten Radamec and Telemetrics.

At NAB2005, two more companies stepped boldly into the studio robotic product segment, Frezzi and Shotoku. The two companies' robotic efforts involve people with roots in the former TSM and Radamec companies, respectively.

So there used to be four robotic companies, and there are four again. What's changed?

Back then, "everything was done on the basis of special projects, one at a time," said James Crawford, president and CEO of Frezzolini Electronics (Frezzi) in Hawthorne, N.J. "You're developing it and you're pushing it through, and then they charge big bucks for that."

MORE CHOICES

"What I think we're witnessing in the marketplace is an increase in competition, which is therefore going to provide broadcasters with significantly more choices than they've had in recent years," said Mike Wolfe, managing director of Shotoku Ltd., a new entry into the robotics field.

"Inevitably the competition does tend to bring the prices down and increases

The new line of robotics gear from Shotoku includes the TG-17 pan/tilt head, which supports up to 33 pounds.

the flexibility in the facilities that are offered in these systems and in any systems." An economics professor couldn't have put it any better.

The economics professor would explain that one-off solutions are inherently expensive, where mass production brings certain economies.

Vinten Radamec, for instance, looks to bring its robotic and manual studio pedestal and head manufacturing closer together.

"We see a benefit from using some of the components and some of the fundamental technology in the robotics range that will help to bring the cost down," said Martin Philp, product marketing manager at Vinten Radamec.

"A lot of the electronics we're designing, use, where possible, off-the-shelf printed circuit cards," said Shotoku's Wolfe. He pointed to lower pricing and the availability of spares worldwide.

Telemetrics Vice President Antony Cuomo pointed out that a fundamental change in the cost of cameras and lenses themselves may portend more affordable robotics.

"The pressure to reduce pricing for camera robotics and remote control systems has been directly tied to the reduction in camera prices," he said. "As cameras and lenses become less expensive, pressure has increased to offer control systems for similar low prices."

The new Pilot Video Panel from Frezzi includes a 6-inch, color-active touch panel with a video display, a proportional tilt/pan/zoom joystick and focus, iris and speed controls.

UNTOUCHED BY HUMAN HANDS

Hand-in-hand has been the introduction of box cameras and lenses not intended for use by an individual, local operator, as well as low-weight teleprompters. "As a result, camera robotics systems can now also be scaled down since they do not have to contend with extreme payloads," said Cuomo.

Designing modular systems that allow the customer to buy precisely what he needs is also a path to affordable systems, said Philp of Vinten Radamec. "Do you either need a head on a tripod, in

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phone companies should seek franchises in areas where "we're the third or fourth provider" of video services—especially since signals will travel via upgraded Verizon infrastructure in existing local networks. But Seidenberg reaffirmed that Verizon will pay comparable franchise fees to local governments.

"Cable companies see us as an insurgent," he said. "It's in their interest to slow us down. In the long term, the market causes industries to converge."

His comments about convergence presaged frequent references to the telephone industry's eagerness to develop multiple services—with IPTV spotlighted as one way to bring digital videoconferencing to business. Seidenberg alluded to "3D advertising" as one of the video features that IPTV will enable—again without details.

FCC Chairman Kevin Martin, in an on-stage discussion with the presidents of the two associations that own SuperComm, also acknowledged the franchise factors.

"I'm sympathetic to the concerns being raised," Martin said, adding that he liked "the prospects of having additional competition."

"We need to reexamine the fundamentals," Martin said, referring to "the silo approach" for regulating various platforms. "At some time, we'll have to take that on."

As for the DTV transition, Martin said that the FCC will execute Congress' demands, focusing on the "hard date" for

FCC Chairman Kevin Martin promoted his philosophy of a "level playing field" for telecommunications services at SuperComm2005.

turning off analog broadcasting.

In particular, he cited "one value of a hard date" is that it will "drive down the prices of boxes." Martin said "minimal consumer disruption is the most important thing." Asked about what he hopes his legacy will be, Martin said, "We created a level playing field for these services."

Martin also observed that his visit to the SuperComm exhibition floor "looked a lot more like CES" (the Consumer Electronics Show), noting in particular "seamless roaming," a reference to a Motorola exhibit that demonstrated how a handheld RFID (radio frequency identification) card could allow viewers or listeners to enable their favorite content to "follow" them as they move between rooms in a house, to their vehicles via various playback devices.

THE MOBILE EXPERIENCE

Motorola, like Scientific-Atlanta a major supplier to the cable TV industry, joined dozens of vendors in showcasing their IPTV and converged technology platforms.

"The business model is still to be worked out," Dan Moloney, president of Motorola Connected Home Solutions group, said after demonstrating the interconnectivity. "Our number one objective is to get communications to help the mobile experience."

Motorola unveiled several IPTV set-top boxes, including HDTV versions and devices that include digital video recorders. Prices are expected to be under $350.

Scientific-Atlanta's booth offered a line of IP set-tops, which can handle both standard definition as well as HDTV plus on-demand services, games and Web-based applications. S-A emphasized that all of its equipment is NTSC-and PAL-compatible and can support multiple standards, including MPEG-2, AVC and VC1.

Thomson extended its IPTV set-top box line-up to include an HDTV unit (model RCA IP1100), although pricing has not yet been set. Keith Wehmeyer, general manager-IP Video, North America for Thomson, said that "just getting set top boxes cheaper "would be helped by standards." He pointed to the cable and satellite broadcasting industries, each of which has exploited consistent digital technology to grow.

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"We could be doing that same thing," Wehmeyer said, urging that some group—he suggested the Consumer Electronics Association or the DSL Forum (a consortium of more than 200 DSL-related manufacturers and organizations)—"develop consistency." He suggested that the technology companies then "take that capability and integrate it into TV sets."

Elsewhere on the SuperComm tech floor, vendors such as Westell, Ericsson, Siemens and UTStarcom cast their set-top boxes in the role of media centers.

More than 30,000 attendees checked out the latest in IPTV and related telco gear at SuperComm in Chicago.

For example, high-end versions of the UTStarcom "Media Console" can handle Gig-E PON for delivery of up to 100 channels. Westell's "Media Gateway" integrates a broadband wireless gateway and cordless telephony with a multimedia engine and a color LCD touchscreen into a desktop device.

Kasenna introduced its PortalTV feature, a customizable turnkey application suite for delivering entertainment services. PortalTV offers a Web services-based delivery platform from which telephone companies and other carriers can use to brand and customize their services.

Kasenna's IPTV application suite was on display at several booths, including the IBM exhibit, where it was part of that company's media server, the IBM Websphere Application Server for Telecom (WAST).

SeaChange International extended its IP Video offerings with the introduction of its Multiverse Suite, an application platform that enables broadband network operators to create video services that can reach TV sets, PCs and mobile devices. The SeaChange Multiverse Suite features open application programming interfaces, using a variety of programming languages (C, HTML, JavaScript and DVD).

CAUTIONARY NOTES

The avalanche of IPTV promises at SuperComm was tempered with warnings about the timetable for introductions.

For example, Carl Russo, president of Calix, a technology platform provider, cautioned that competitive video bundles "need to reflect changes in consumer behavior, [including] more choices, more on-demand and more interactivity."

"The choice of whether or not to offer video services and the selection of underlying access technologies are largely independent decisions," Russo said in his luncheon remarks to an IP Video conference under the SuperComm umbrella. He referred to the various architectures of FTTP, FTTC, FTTN (fiber to the premises, curb or node) and pointed out that "properly engineered, IP-based video services will operate over any copper, fiber or even wireless networks." He stressed that "successful service providers [should] focus heavily on the consumer experience."

Russo's remarks fit into the ambitious but cautious milieu of SuperComm vendors and speakers. Despite the high-profile IPTV announcements from SBC and Verizon, vendors acknowledged that most of their focus for now is on "tier two and tier three" telephone companies, the smaller, regional companies that are often more aggressive in their video objectives.

"Telcos have to solve network issues, build up their capacity," said Thomson's Wehmeyer. He also cited fundamental infrastructure issues—such as remote management and diagnostics—that are essential to the video agenda, and which will require substantial "OpEx" (operating expense) commitments. ■

A Decade of Change in News Tech

The newsroom revolution turns 10

by Claudia Kienzle

HAMILTON, N.J.

In the last decade, TV newsrooms have witnessed more technological change than ever before. Instead of an inefficient, linear, tape-based workflow, newsroom technology has evolved to the point where it is now possible to configure an all-digital, tapeless, streamlined workflow where media assets are kept in digital form from acquisition, browsing, and editing, to play-out to air and archive.

Today, most TV stations in the United States have adopted the cornerstone of this technological revolution—the Newsroom Computer System (NRCS)—which supports every aspect of the news production process, including assigning stories, writing copy, tracking progress, organizing newscast rundowns, and more.

While most stations are now using either an NRCS from Avid or The Associated Press, as well as nonlinear editing systems, vendors we spoke with estimated that only 20 percent of stations have adopted a fully tapeless news production workflow, which would allow them to acquire, ingest, browse, search, share, and manage digital media throughout the process.

But, they add that the industry is finally poised for dramatic growth because many of the obstacles to widespread adoption have been removed. Besides the advent of affordable disk-based camera technology (such as Panasonic DVCPRO P2 and Sony XDCAM), there are now industry standards promoting interoperability between third party devices for greater flexibility.

BREAKING GROUND

"In the mid-1990s, stations were very concerned that codecs were closed and solutions too proprietary. Since then, there's been an explosion of open standard protocols, such as DV for video, and MOS which ties together third-party devices that users might like to configure," said David Schleifer, vice president of broadcast and workgroups for Avid Technology. Initiated by the AP, MOS, or (Media Object Server) was developed in cooperation with Avid and other major vendors.

"While we were a newcomer to the broadcast area 10 years ago, since then we've worked with hundreds of broadcasters—from networks to independent stations—who've adopted our Unity for News solution, including the iNEWS newsroom automation system, NewsCutter NLE, digital asset management, and Unity shared storage—to make their newsrooms more efficient," Schleifer said.

The Newsroom Computer System (NRCS) supports every aspect of the news production process, including assigning stories, writing copy, tracking progress to organizing newscast rundowns.

"One of the first broadcasters we worked with was Gannett, a station group that includes WKYC-TV, in Cleveland, Ohio. Gannett has been very proactive in looking for ways to manage their workflow and justify the upgrade," Schleifer said. "This technology will empower stations that want to stake out an early presence in new media outlets, such as the Internet and mobile TV, even in advance of business models being developed."

SAVING SHOE LEATHER

"Ten years ago, the producer of the 6 p.m. newscast would have had to spend 30 to 45 minutes on the phone or physically walking around to editing stations to find out the status and content of videotapes planned for the rundown," says Bill Burke, product manager for ENPS at AP in Washington, D.C. "Today, with ENPS, as soon as that story is edited and saved on the server, you're alerted by the system, and you can click on that asset to view it. As a result, the process is easier and the newscast more polished."

Also, if an affiliated station had a story you'd want to include in your own newscast, Burke said, arranging to get a copy of that story would likely take several man-hours and satellite time to transfer. Today, with ENPS, producers can quickly search for desired assets, and then drag them over into their own NRCS. "ENPS knows if the media file associated with a news story is not on the station's local server, and a pointer tells the system the location of the file and it's automatically retrieved as a background process," Burke said.

"ENPS was designed to support the sharing of data and media resources by multiple locations. Many of our biggest customers are station groups—like Hearst-Argyle, Media General, Raycom, Emmis, and Tribune—who use our NRCS to support news production across their group," Burke said. "Finding and retrieving the media assets you need quickly is the key to repurposing them to add value to your on-air newscasts."

EMPOWERING JOURNALISTS

WJLA-TV in Washington, D.C., uses the AP ENPS, as well as Leitch Predator software for low-resolution proxy editing and Nexio SAN multichannel server. "WJLA is very forward-thinking and is among the 20 percent of stations that have migrated to a fully digital news production solution," said Andrew Warman, product marketing manager for servers at Leitch Technology in Burbank, Calif.

"WJLA has 30 journalists editing in low-resolution at the desktop, as well as 12 editors editing the same shared footage at full-resolution in NLE bays, all at one time," Warman said. "Rather than having to work off tape decks and video monitors, these journalists can screen footage right on the NRCS screen, do a rough edit on the footage, then transfer the edit decisions list to the editor for finishing, which saves the editor time."

The journalists also handle entering metadata and earmark media for archive.

"WJLA acquires footage in the field on DVCPRO tape. When the tapes come in, they stick them in tape decks and digitize them for manual ingest," said Kyle Cowan, Leitch product manager for news editing systems.

"But, when stations begin to acquire footage using disk-based cameras, such as Panasonic's DVCPRO P2 or Sony's XDCAM, many of them will be motivated to justify the expense of a fully digital production solution because the media and proxies will come in as digital files for automatic ingest," Cowan said. "In fact, as disk-based, HD cameras become available and affordable, a lot of stations may actually jump right into HD, bypassing SD digital newsroom production systems altogether."

MOVING INTO THE OPEN

"In 1995, the idea of having a NRCS for such tasks as writing scripts, producing rundowns and managing wires had just become the norm," said Ed Casaccia, news workflow manager for Grass Valley in Nevada City, Calif. "At that time, we introduced the Profile, which invented the category of video server. Once you replace tape with a tapeless solution, all sorts of possibilities arise for streamlining the workflow."

In the mid-1990s, "broadcasters were concerned that many of the newsroom automation systems on the market were proprietary," Casaccia said. "Grass Valley's approach has always been based entirely on open standards, such as MOS, as well as two protocols now standardized by SMPTE—MXF [Media Exchange Format] and GXF, a streaming media protocol. While we can provide an end-to-end solution from field acquisition to play-out, we ensure integration with third-party systems so our customers can design their own workflow."

The current product line includes the Grass Valley NewsBrowse Web-based browser/editor; the NewsEdit XT NLE; NewsQ Pro integrated news playout system, and Ignite, which helps in the repurposing of material. "News is a wonderful commodity because you can have it, sell it, and still have it," Casaccia said. "It can be repurposed for re-use in other ways for very little cost and generate new revenue streams."

GEARING UP

AP's Burke, the said, "While this technology is very valuable, there are still many stations that are just now making the conversion to nonlinear workflows. In many cases, it's because of the huge capital investments they've made to put up their DTV transmitters.

"But there's a paradigm shift taking place," Burke said. "Stations are realizing that DTV brings the opportunity to add an SD channel devoted to news, sports, and weather. Since stations will not significantly expand staff or facilities to handle producing news for more outlets, it will be critical for them to adopt an all-digital, 'core-to-multiple outlets' workflow that supports the news operation intelligently and efficiently." ■

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Making the Case for News Automation

Look at the whole picture, rather than the parts, manufacturers say

by Craig Johnston

SEATTLE

The news director may see how it steamlines the workflow, the director of engineering may buy off on its reliability, but getting the authorizing signature for news automation from a bottom-line-focused general manager is the final hurdle to cross.

TV Technology polled several news automation vendors on selling their technology to the general mangers, and while they all agreed economic efficiencies were high in the GMs' minds, there's a lot more to it than that.

STABILITY ENGINE

"What I've also come to understand is that what GMs want from the newsroom is a 'stability engine,'" said Fred Schultz, vice president of news automation at Sundance Digital in Irving, Texas. "They've already got a lot of digital technology both in place and in the pipeline, what they need from the automation is to make good on the promises of those investments.

Fred Schulz, vice president of news automation at Sundance Digital

"As far as they're concerned, newsroom automation must not only bring those promised features of those devices, but stability to their operations, and to the cost of personnel, and to the competitive quality of the news itself."

Bob Valinski, director of business development at Raleigh, N.C.-based Crispin, amplified that point. "Talking to a general manager, you have to realize that in a lot of these stations producing news, 60 percent of their revenue comes from that newscast. That newscast becomes the face of the station, so it's more than just talking to them about cost savings.

"You need to address them on how it's going to enhance their product, how it's going to create a new revenue stream without hurting them, because it really isn't just cost savings when you're talking news, it's a different approach you have to take."

Selling the GM on newsroom automation can be a matter of channeling his expectations, said Dave Polyard, senior vice president of sales and marketing for Omnibus Systems.

"If the general manager simply wants to accomplish labor savings only, that's fine, but I think the expectations have to be set that there are certain dayparts where automated news product in a traditional U.S. broadcast news environment doesn't necessarily work.

"The expectation has to be set that any automation product they buy is going to be flexible enough to give them the opportunity to fully automate some programs, partially automate others, and perhaps not automate at all the broadcasts that are particularly complex and particularly important to them."

Polyard said in the immediate term, those more complex programs

Dave Polyard, senior vice president of sales and marketing at Omnibus Systems

may be able to benefit from automation assist, where the automation system delivers content to the TD as it is needed. At some point down the road, more complex newscasts may be able to be automated or at least more automated.

"I've talked to so many general managers," said John Price, director of

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NEWS TECHNOLOGY **Harlan Neugeboren**

Back from NAB: It's Time for Change

Annual confab allows stations to evaluate current, future news needs

Each year, many of us come back from NAB with ideas, brochures, CDs and wishes to find a way to convince management to purchase some of the things we saw.

Many of us have immediate needs and must make purchases. However, for many of us, NAB is a time to gather information to begin to plan for our next year's budget process.

Planning is the keyword here, because many people don't step back and look at the broader picture, analyze what has been presented and determine what pieces or systems fit within our workflow. Workflow is the other keyword. As I have mentioned in previous articles, workflow and planning are key to any project.

AP Snapfeed allows the user to edit a story on a laptop and transmit it to the newsroom over any type of wireless connection.

THREE KEY CONCEPTS

However, three other concepts need to be explored—looking to the future, evaluating current facilities and operational practices, and determining how they allow for enough change to keep our businesses healthy. The keyword here being "change."

Change is very difficult for most organizations because the attitude usually is, if it ain't broke, don't fix it. However, in today's competitive environment, news organizations should really examine how they are doing things and how they are positioned to get into other business opportunities like cell video, VOD and alternative programming services.

As the number of programming outlets increases, there will be a need for more programming. Just doing the morning, noon and evening newscasts may not be enough.

Consumers are being exposed to more and more ways to get content—primarily broadband and wireless devices, but also portable media players and wireless devices such as the Treo phone.

Remember the, "I want my MTV" campaign? Look for the "You can have it your way" campaign from the telcos.

I am not advocating throwing everything away and starting from scratch, but rather a real examination of your current operations and an open-eyed look at where the business is headed. I'm sure many of you are saying "he doesn't understand our business," or "we don't have the money," or "I'm still making good money on my newscasts."

WHERE THE EYES ARE

A small fact—more than 15 percent of people ages 17 to 34 get their news from the Internet. And the number is higher as you look at teenagers 13 to 19. Google is beginning to index (via closed-captioning) newscasts from some broadcast stations and other programming outlets.

Go to *http://video.google.com/video_about.html* and see for yourself. Simply put, there will be many ways other than the current platforms for consumers to get news and information. Why not be the one to deliver

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Change

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it to them. It's easier than you think...

Many of you focus on the basics—the vo for the five, the vosot for the six and the package for the 11, but much more content could probably be leveraged if you reconsidered newsgathering methods.

Look at what you are shooting and what you are airing. Then look one step further. For example, if you are at a press conference or school-board meeting, what would it take to capture the entire presser?

Even if you shoot on tape, after you edit the story, the footage can be ingested using the N2 Broadband XPort Producer to create a version to FTP to your local cable company's VOD system.

You can also encode a version that will be usable for cell phones. Look at the "Video & Streaming in Nokia Devices" at *http://www.nokia.com/search3/search.jsp?wsid=005* for more info. This is a very cost-effective way of extending your brand into two other platforms with minimal work and investment.

In addition to changing the way we look at how we produce, we also need to look at what we use to produce it. I strongly urge you to begin looking at technology that leverages consumer and IT technology. This includes cameras, editing and automation.

Building4media offers a news production solution based on Apple Final Cut Pro and X Serve. Omnibus has Headline, a news editor based on Windows Media that will run in an ActiveX window inside ENPS.

Omnibus offers a full level of automation and asset management based on Microsoft .NET. The .NET framework manages much of the plumbing, enabling developers to focus on the core business logic code.

Omnibus showed the beginnings of a Windows Media-based production system that included servers and mixing devices based on standard video cards.

Vizrt has built an HD graphics system based on the NVidia video card.

HDV, the consumer HD standard, will allow you to produce HD video using a $4,000 camera and Final Cut Pro HD, Avid Xpress Pro HD or Sony Vegas. For field acquisition, MPEG-4 and WM10 offer cost-effective ways to do live shots via datacasting.

Hughes Network Systems will launch Spaceway sometime in 2007, which will allow users to use a low-cost uplink that can be mounted on an SUV to transmit IP-based video to a satellite via a 2 Mbps data-circuit. ABC News Now used Sprint video cell phones to cover the presidential inauguration: *http://www2.sprint.com/mr/news_dtl.do?page=print&id=5260*.

One news vendor has done a great job of looking at the newsgathering process and developed solutions to allow its users to more easily gather the news—ENPS.

Look at Snapfeed. This is a simple-to-use system that allows the user to edit a story on a laptop and transmit it to the newsroom over any type of wireless connection via a simple-to-use interface.

When users connect to the ENPS server, they can pick their story slug from a list and the system sends an alert to users in the newsroom that the story is on its way. The slug was created in the newsgathering grid and contains all the necessary information and metadata. When the story is transferred, the duration is updated and another message is sent that the story is filed. See *http://www.enps.com/features/snapfeed.aspx?sid=2* for more details.

It is the art of the possible and looking beyond the standard way of producing news that will allow broadcasters to compete in the future. ■

Harlan Neugeboren is vice president of operations at A&E Networks. He can be reached at harlan@harlann.com

News Editors Ponder a Tapeless Future

Stations' news divisions consider pros and cons of new formats

by Geoff Poister

BOSTON

When it comes to editing news in the field, there have never been so many enticing options. But for many stations, the confusing part is deciding the best choice for acquisition.

The existing challenge is not turning a laptop into a portable NLE, but getting the video into the laptop fast enough to meet news reporting requirements. That decision now involves taking a hard look at some revolutionary camera systems. These include cameras that record video directly to hard drive, optical disc, and memory cards.

A quick survey of a number of television stations indicates that no single format is sweeping the market. Instead, different stations are acquiring specific formats for different reasons. And some are choosing to just stick with what they have until the technologies mature.

Transferring footage into an NLE has been a time-consuming step that has inhibited news crews from going nonlinear. But this is the step that is now being eliminated as we shift to tapeless capture.

Avid Newscutter XP

EDITCAM

KNXV-TV Channel 15 in Phoenix is one example of a station that made the nonlinear acquisition leap and is quite satisfied. They chose the Ikegami Editcam3, which records video directly onto removable hard drives.

"The great thing about the Editcam3 is that you can edit right off of the field pack," said Erin Gramzinski, assistant chief news photographer at KNXV. "We wanted something that is fast with no digitizing."

The Ikegami Editcam3 creates a separate clip identifiable by a thumbnail every time the camera operator hits record. Clips can be transferred into a laptop faster than real-time because they are data files. KNXV uses laptops in the field running Avid Xpress Pro, but they are considering switching to Avid Newscutter XP to create better compatibility with the station's Avid Newscutter systems.

Gramzinski noted there is still some tweaking to be done. Working in Arizona on 100-degree days, the cameras can easily overheat. He also voiced a common concern about how best to archive all of this digital material. This is a problem that applies to all of the new non-linear acquisition formats.

XDCAM

The Sony XDCAM system has an allure to it that is attractive to many stations. XDCAM records onto DVD-like optical discs, which are easy to carry and store. The discs encode video as MPEG IMX files at a scaleable bit-rate from 30 to 50 Mbps with 4:2:2 sampling, or a DVCAM file at 25 Mbps. So, when recording at the highest quality of 50 Mbps, it's essentially DigiBeta quality without the tape. The discs offer random access to clips indexed by thumbnails, and an editor can work with full resolution material or low-resolution proxies. Each disc holds up to 45 minutes of 50 Mbps video, so a large advantage here is the light weight and compact nature of the media. When connected to an NLE, the computer sees the disc as a hard drive and all of the material is easily accessed and ingested. And, like the Ikegami Editcam, it is compatible with a wide range of NLE products, including Avid, Final Cut 5.0, Grass Valley news edit series, Pinnacle Liquid series, and Canopus.

According to Wayne Zuchowski, marketing manager for Sony XDCAM, news outfits are among the main customers.

"Upgraded software, such as Avid Newscutter XP, enables news people to use the XDCAM system and take advantage of a much faster workflow," Zuchowski said. "We have shipped to many broadcast organizations, including CBS O&O's, groups and independent stations as well as several PBS stations."

P2

The Panasonic DVCPRO P2 system is the most revolutionary new kid on the block. These cameras record directly to memory cards and hence have no moving parts. Consequently, these cameras require less power consumption and require less maintenance.

However, the current cost of memory cards is causing some stations to hold back. Panasonic is banking on Moore's law to bring cost down and capacity up in coming years.

But some see no need to wait. Media General, Inc., is converting 19 of its stations to Panasonic DVCPRO P2 systems.

"The industry has been talking about 'the tapeless television station' for the past decade, but the roadblock has been field acquisition," said Ardell Hill, Media General's senior vice president, broadcast operations. "With P2, Panasonic presents us with a clear roadmap to a genuine tapeless operation over the short term." Hill also cited the reduced maintenance of cameras with no moving parts as an incentive.

On the field editing side, virtually all NLE software functions on laptops and one has many choices. But for news, the primary choice has been Avid Newscutter XP. For one, the system is designed for newsgathering. Secondly, many stations already have Avid systems which makes it a logical choice to add to the field package.

Avid Newscutter XP is also compatible with virtually all camera formats including DV25, DV50, XDCAM, P2 and HD.

"Newscutter is the premiere editing standard in news and it is designed for editing news," said David Schleifer, vice president of Broadcast and Workgroups at Avid. "It has all of the news features at the station in a portable package, and we provide 24 hour technical support."

Avid Newscutter XP on a laptop in the field can also connect to the newsroom's computer system and take advantage of asset catalogues and management.

Despite the promising innovations, there is a sizeable contingent that is either content with the equipment and methods in use, or who are studying the offerings before making any broad purchases.

"We're sitting back and watching," said John Premack, chief photographer at WCVB in Boston.

WCVB is currently using DVCAM for news gath-

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Automation

CONTINUED FROM PAGE 14

product management at Digital Transaction Group, "and their two questions to me have always been, one, the initial cost, and then reliability. Especially in news, if you're putting something on, it has to be there when you hit the button."

Jim Moneyhun, president and CEO, Florical Systems

GMs evaluating the need for news automation should also pay attention to recent changes in news, said Jim Moneyhun, president and CEO of Florical Systems, Inc.

"Local news, sports and weather on mobile telephones are one of the keys to adding viewers and new revenues. At the same time, the new products should not require additional personnel, so automation is essential. The [vendor] they choose should have resources and technology to change the paradigm of the TV station news business model."

DIFFERENT FROM MASTER CONTROL

Some of the difficulty in selling newsroom automation to a non-technical general manager is the fact that he's likely already bought a master control automation system, and doesn't realize the difference between that and a newsroom automation system.

"There is a real night and day operational distinction," said Schultz, of Sundance. "Starting with the fact that automation in master control is true automation in the sense of a playlist, or even more crudely, a clock timer. Whereas automation in news has to be technology at the beck and call of key personnel."

DTG's Price amplified that difference between master control and news automation. "With the newsroom, there are a lot of unknowns. Automation requires some advance notice that something's going to happen, to allow any kind of automation system to control it."

"There's a schedule environment in master control, versus that ad hoc, last minute environment in the newsroom," said DTG Field Service Engineer John Buszinski.

Polyard, the executive at Omnibus, pointed to the difference in the scheduling engines for master control and news automation, where master control systems are scheduled through a sales traffic system.

"On the newsroom side the scheduling system is the newsroom system, so without a really good link, and using MOS protocol and having a real-time link between the newsroom system and the automation system, news automation isn't going to work," he said.

"In newsrooms you have a lot of operation costs associated in getting the news automation installed and running," said DTG Field Service Engineer John Buszinski.

"You have a lot more cost in terms of the personnel, a lot more volatility in the newsroom versus master control," he said.

Florical's Moneyhun said he encourages GMs to look beyond separate master control and news automation systems. "Instead they need to be sold on the concept of a station-wide integrated information technology system that also provides the functions of controlling equipment."

Crispen's Valinski noted that while operational cost savings are easy to see in master control automation systems, GMs have to take a broader look when evaluating news automation.

"Cost savings is an added side benefit on some automation, but it's really 'how do I enhance my product to get more audience?' And that's through creating more efficiencies so that people aren't wasting their time doing the mundane tasks, but can be out covering more stories, out to the community more." ■

Giving Journalists the Editing Instinct

Avid introduces NLE software with the reporter in mind

by Susan Ashworth

TEWKSBURY, MASS.

Thinking like a broadcast reporter on a deadline—with an immediate need to access images and pull together text—Avid Technology has designed a new editing system with the journalist in mind.

Introduced at NAB2005, Avid iNEWS Instinct was designed to make news production a faster, more nimble process. To do so, the company has taken a big leap of faith and dropped the traditional NLE interface, one that is usually based around a horizontal linear timeline with drag-and-drop capabilities. While this design has been a well-established norm for professional video editors, the conventional NLE interface often seems foreign and overly complex to the typical reporter whose been tasked with editing a video clip, Avid officials said.

NEWSPAPER FORMAT

So Avid threw out the old, and came up with the new: a vertical interface that reads more like, well, a newspaper. With the Avid iNEWS Instinct, reporters are able to create news stories with text and video footage without needing to learn the ins and outs of a professional NLE, according to the company.

The system "supports the changing role of journalists and desktop news professionals who are increasingly asked to do more within their organizations," said David Schleifer, vice president of Avid Broadcast and Workgroups.

Rather than dragging and dropping text into a video timeline, reporters can work a bit more intuitively: write a few sentences of script in designated text boxes and then lay video clips next to the corresponding text. Reporters can also add audio voiceovers and either send the completed story directly to a server to air, or over to a professional news editor who can add stylized transitions and graphics.

A journalist at WFTV uses Avid Instinct.

"We wanted to bring both worlds together," said Johnathan Howard, Avid senior principal designer for broadcast, referring to the offering of some conventional editing options as well as an interface built specifically for a journalist. Existing solutions on the editing market "were complex and not instinctual for the journalist," Howard said.

The system's interface includes several windowpanes, including a screen for assembling clips, one for finding and accessing assets in the newsroom database or via wire service feeds, one for watching and selecting video clips, and a window for viewing the clips and text together as a final edited piece. These windowpanes can be customized as needed.

The goal, Schleifer said, is to "extend the power of visual storytelling to every desktop in the newsroom. We wanted to empower journalists. Every other solution required the reporter to learn another tool."

THE LOOK OF FEAR

Time after time, journalists would sit down in front of a traditional editing interface "and had fear" on their face at the unintuitive interface of a traditional NLE, Howard said. "We were trying to solve the problem with traditional tools, but realized a radical new concept was needed," he said.

Avid Instinct also expands the reach of the company's news management system, the iNEWS newsroom computer system, by providing a link between the newsroom and the equipment in the video production chain, including acquisition, editing and playout applications.

Several broadcasters have adopted the system, including ABC News, which has agreed to purchase 100 seats of the iNEWS Instinct system; WFTV, an ABC affiliate in Orlando, Fla.; and CNBC Asia.

CNBC Asia Pacific will be installing 10 Instinct seats after seeing the system's ability to provide high resolution browsing on all seats.

"We will automatically benefit from our ability to [quickly] turn[over] breaking news on air as well as speed up the process of creating multimedia content for other platforms," said Peter Juno, senior vice president and director of operations for CNBC Asia Pacific. ■

Editors

CONTINUED FROM PAGE 16

ering and editing tape-to-tape in the field.

"On a given day, 30 to 40 percent of our news packages are edited in the field," Premack said.

The editing is done in satellite trucks or ENG microwave vans, usually by the driver, leaving the reporter free to continue working. It's a system that works and they feel no immediate urgency to change it.

"Conversion to a different form of field acquisition is a certainty, but right now we're experimenting," Premack said.

Mike Keller, Hearst-Argyle Eastern Region director of engineering is carefully studying the landscape before committing to a single NLE field system. He is "weighing the drawbacks" of three main options: XDCAM, Ikegami or Hitachi hard disk cameras, or Panasonic P2 systems.

"Right now, I'm building models for each system so that we can compare all of the features," Keller said. "It's all about the workflow. All of the systems create great pictures. It comes down to which format will eliminate wasted time and free up the reporters and editors to tell better stories with the tools that we give them."

But alas, the answer is not yet in hand. Panasonic P2 is an exciting concept; with the low maintenance factor a big plus, but the price of memory cards daunting. XDCAM offers extremely efficient media storage, but some balk at the idea of editing from proxies. Ikegmi Editcam3 pushes hard drives to their limit in the rough and tumble world of newsgathering. One also has to consider whether the adopted system will migrate easily to HD in the near future.

But one thing is clear. Dispensing with tape and moving to nonlinear acquisition is the final step to a faster, more efficient workflow. And all of the tools are moving in that direction. ■

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DIGITAL JOURNAL

Bill Hayes

Branding ACE

Creating lasting impressions in a multichannel universe

JOHNSTON, IOWA

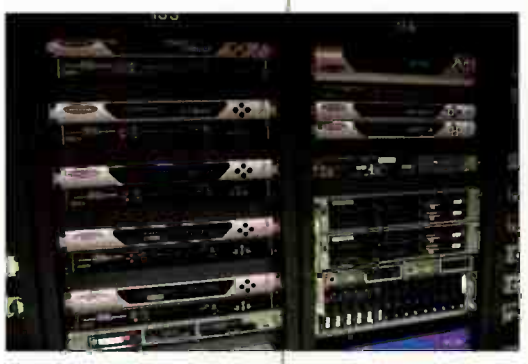
At IPTV, we are currently knee deep in the installation of the PBS ACE master controls system. In previous articles I have explained the overall concept of the system and what we expect it to do. I would love to be able to present some definitive examples of how well it is working but at this time, the system is still in the process of being configured.

One key area that I did not want to scrimp on was the branding element. Since our operational plan calls for a four channel multicast during a portion of the day and an HD broadcast during portions of the day, branding five channels requires a significant investment in hardware. Our ACE system includes five Miranda Imagestore 2s (N+1) and one Miranda Imagestore HD. All five of the SD units have the optional MEM-4000V memory upgrades that increase the capacity of the units from the standard 40 full frame images and three-quarter-second full frame animation to 4,000 full-frame images and 6 seconds of full-frame animation. The HD unit has the optional MEM-HD-1000V that increases the capacity from 40 full-frame stills and about one quarter of a second of full frame animation to 1,000 full frames and 1.1 seconds of animation. All of the units include the appropriate optional A/B mixer to increase the flexibility that will improve the look of the brandings as they are used on air.

STAYING FRESH

The tightly integrated concept of the ACE system blends the operation of these branding systems into the Omnibus automation system under the direction of the Broadview traffic system. By scaling the storage capacity of the units as large as we have, we present a significant quantity of images that can be keyed over programming or inserted between programming to add a dynamic and varied look to. The idea is to insure that the viewer knows that they are watching IPTV without the look becoming stale. In our operation we want our viewers to first recognize us as Iowa Public Television and then PBS to maintain that local connection that is often missing or obscured in the multichannel world we now live in. It is critical for the health and growth of our stations that our viewers know that there is a significant difference between us and a direct feed from PBS. The primary way we do this is by creating and tailoring local content to meet the needs of our viewers, but branding is critical to insure that the message is consistent across the full spectrum of content that we air.

The graphics and animations that are used by the Imagestores can come from any PC- or Mac-based system. All of our Imagestores include the Ethernet option that facilitates drag and drop importation from the graphic system or one of the other Imagestores. The file formats are pretty much the usual suspects for the still images and, of course, the Imagestores allow for adjustment of the size, placement, transparency and other characteristics of the image.



The IPTV ACE installation features five Miranda Imagestore 2's (N+1) and one Miranda Imagestore HD.

One of the hitches that developed as our system was being built and configured at AF Associates was the limitation of our Sage EAS system. In our current single channel environment we have our EAS decoder configured to store some messages like a "weather watch" to play out at a convenient time and other items such as an Amber Alert to go immediately. In the multichannel world we want to maintain that flexibility and unfortunately, the Sage unit could not accommodate a single message being stored and played out at different times over different channels. We had to purchase a TFT-911 with serial port option as well as the optional status/remote control module. Not a particularly tremendous expense in the scope of the project, but it was still an unplanned addition.

IPTV's ACE facility is the first PBS installation to go live.

TOO MUCH OF A GOOD THING?

The one feature of the Imagestores that I have mixed feelings about is the animation capability. Earlier I mentioned that the SD unit has the capacity for 6 seconds of full frame animation and the HD unit can do 1.1 seconds of full frame; that is merely a benchmark for comparison. The actual animation capacity of the unit is also a function of the screen size of the animation. According to the specification, an animation that is 1/64 of the full frame on the SD increases the capacity to 6 minutes and on the HD to 68 seconds. Our promotion folks are thrilled with this concept of course, because it will provide them with the ability to create more dynamic and compelling supers and keys, (I have heard them referred to as "pop-ups"). I have seen them on a number of channels like Spike TV where they frequently are so large, last so long and are so distracting that they disrupt the viewing experience. I am sure that our folks will use good judgment and restraint in the creation and implementation of animations.

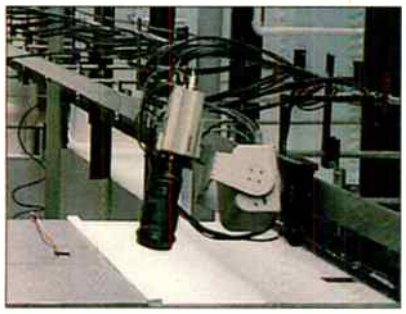
One question that I have yet to have answered regarding the capabilities of our networked Imagestores is in regards to their capacity as a network. It didn't dawn on me until after we had placed the order; can each unit operate as an island or can their capacities be aggregated across the network? If the latter is the case, we have just created a still library with a capacity of 20,000 stills. If that is indeed the case, than I suspect that we'll have some time before we run out of space.

Overall, my impression of the Imagestore is that it will provide a good vehicle for allowing IPTV to effectively brand our SD and HD feeds. Its integration into the ACE network will permit complex combinations of branding and animation over content that will help our audience recognize that they are watching IPTV and although we are happy to air content from PBS, their connection is with us directly. ■

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

Robotics

CONTINUED FROM PAGE 10



Chinese broadcaster ShenZhen TV recently installed a complement of Telemetrics robotics gear at its new broadcast facility in Guangdong.

its most basic form with a controller that can do three or four heads, or do you want to expand it all the way out to [a 19-camera solution] like CNBC?"

Frezzi's Crawford said with the drop in prices, he is seeing robotics move out of the studio and onto location, including the use of a Frezzi system by Desert Sky Digital its CourtTV courtroom coverage. "This system is portable, with cameras in the courtroom with a controller, and then a guy outside in the satellite truck with an override," he said.

"The pressure to reduce pricing for camera robotics and remote control systems has been directly tied to the reduction in camera prices."

—Antony Cuomo, Telemetrics

Telemetrics' Cuomo pointed out another way robotics users have saved money is by cutting down on the number of cameras and pan/tilt systems needed, in their case by providing their TeleGlide camera track. "In many instances, one of these track systems can eliminate the need, and cost, of multiple pan/tilt heads, cameras and lenses."

The new economics of robotics not only work in favor of those who will be purchasing their first camera robotic system, but as well for existing customers looking to upgrade. "We want it to work with the old equipment, and we can build on that to make it work for both existing Radamec and Vinten customers," said Philp.

At Shotoku, Wolfe noted they have introduced a product called "protocol adapter," which will enable the Shotoku control system to drive pan-and-tilt heads from other systems, and vice versa.

Yet another factor in the lowering of prices for robotic systems is the fact that any control system beyond a simple joystick pan-and-tilt system must be computer-based. The well documented continuing rise in processing power and storage space at no increased cost not only makes robotics more affordable, but allows sophisticated features to be included.

Add to that the research and development efforts put into virtual reality pan-and-tilt systems, which have yielded camera position feedback well beyond the requirements of existing robotic systems.

"I think one of the most significant advances has been this facility that we call 'learn mode,'" said Shotoku's Wolfe. It allows the robotic control system to "learn" a camera move executed by an operator manning the camera in the manual mode, then play the learned move back repeatedly from memory.

Calculating the return-on-investment from robotic camera systems by looking at the camera-operator salaries eliminated used to make it hard for small stations, paying minimum wages to part-timers, to justify the relatively hefty robotic investment. With new competition putting the squeeze on prices, small stations may want to take another look. ■

CCTV 'Prophets' From Management Solution

Station group promotes WANcasting for DTV

by Claudia Kienzle

TULSA, OKLA.

Like most station groups, Clear Channel Television (CCTV) has realized that the economic pressures of DTV, especially multicasting, call for finding a cost-efficient solution for managing and streamlining the broadcast workflow enterprisewide.

"With 38 stations in the group, the number of DTV channels CCTV will be delivering to air could grow to over 100 in the near future," said Michael D. DeClue, senior vice president of CTO and director of engineering for CCTV, in Tulsa, Okla. "The multiplication of effort related to providing additional DTV channels comes at a time when we're facing challenges on our revenue side. Since DTV is not necessarily going to deliver more revenue, we need to automate the process in a way that significantly reduces costs without adversely impacting the quality of our on-air product."

MOORE FLEXIBILITY

"Rather than employ any of the TV broadcast automation solutions on the market, we felt this challenge called for us to adopt an innovative platform based on open standards and IT-based technology," said Chip Jellison, co-president of Prophet Systems, a subsidiary of CCTV, in Pogalalla, Neb. "This would hitch our operation's future to Moore's Law, which means that as the cost of off-the-shelf computer components steadily decline, the power of our infrastructure would increase. These economies of scale would not be possible if we based this content management and automation solution on proprietary broadcast devices from a variety of industry vendors."

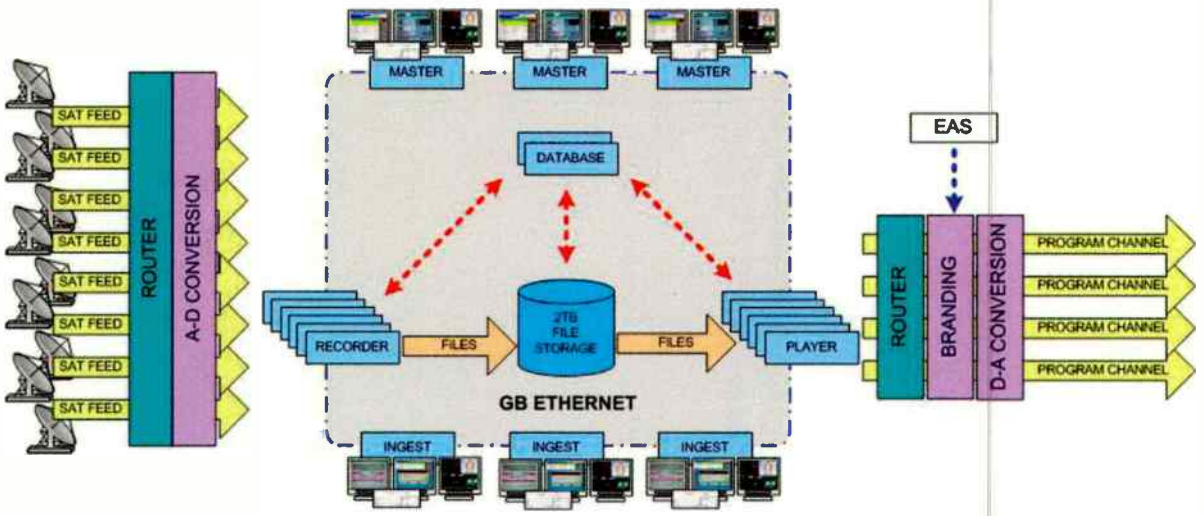
With no readily-available solution capable of leveraging only open standards and off-the-shelf components, such as hardware components from Hewlett-Packard, Gateway, and IBM (using standard video cards), CCTV asked Prophet Systems to modify its mature, proven NexGen automation solution—being used to automate 1,300 Clear Channel radio stations—to meet the needs of the television group.

Besides NexGen, CCTV is also leveraging its wealth of resources, including satellite transponders and transmission assets; its private, high-speed wide area network (WAN); and its TOC (TV Operations Center), in Tulsa, Okla.

BREAKING NEW GROUND

"To fully appreciate what NexGen is going to do for Clear Channel, you first need to put the conventional broadcast automation model out of your mind," said Tim Bock, president of Digital Resources, Inc., CCTV systems integrator in Tulsa, Okla. "We determined that it would be too costly to use multichannel broadcast servers running an arsenal of video devices, let alone the cost of installing additional units of everything for back-up. It's not just the capital costs; it's the recurring costs that become unwieldy and those are the costs that we most wanted to contain."

The Prophet NexGen system offers CCTV the flexibility of multiple modes of operation—including a standalone configuration at each station; or a central network model serving real-time or non-real-time streams to multiple stations; or a combination of the two at different parts of the day. The local station might have full control during its primetime and local newscasts, but the station's operation might switch over to the TOC in Tulsa during the night and on weekends, where one person would monitor signals for multiple stations.



CCTV'S Television Operations Center offers the flexibility of multple modes of operation, including a standalone configuration at each station or a central network model serving real-time or non real-time streams to multiple stations, or a combination of both.

In addition, high value content, such as closed captioning, can also be introduced into the WAN pipeline. Media, sent as MPEG-2 compressed, broadcast-quality bitstreams of about 6 Mbps can be transmitted via the WAN in realtime or in a store-and-forward fashion; or multicast to stations via satellite; whichever is more economical.

CCTV has a three-year timetable to integrate the NexGen system at all of its stations. Currently, three stations use NexGen on a standalone basis: KGPE-TV, a CBS affiliate in Fresno, Calif.; KMTR-TV, an NBC affiliate in Eugene, Ore. and Fairbanks, Alaska NBC affiliate KTVF-TV. However, three others are now being controlled from the TOC: KOKI-TV, a Fox affiliate in Tulsa; KTFO, a UPN affiliate in Tulsa; and (within one month) KVOS-TV, an independent station in Bellingham, Wash.

"What makes KVOS unique is that the station's signal will be packaged at the TOC in Tulsa and sent to Bellingham as an IP stream over a (bi-directional) MPLS (Multi-Protocol Labeled Switching) network—kind of a mix of industry-standard IP with QoS [Quality of Service] built-in," said Brian Coombs, project manager for CCTV. "Then, they will add their local news to it locally and run it to air using both their analog and DTV

transmitters. All of our TV stations are connected at roughly 3 Mbps but that number is increasing to 12 or 45 Mbps depending on the task we try to perform at that site."

ANATOMY OF A WANCAST

"Rather than thinking in terms of a broadcast automation solution that drives servers, VCRs, or other external video boxes, we think of NexGen as a content management solution that creates, manages, transfers, supports, and verifies the entire broadcast process at peak performance," said Tim Gieschen, co-president of Prophet Systems. "We call it WANcasting—the distribution of files—including spots, promos, and long-form programming—across the WAN architecture one time to hundreds of industry-standard servers groupwide, which play them out to air in a fully automated process.

"Using its network of NexGen clients, the TOC processes programming content into files. For example, the TOC takes a linear satellite feed for a one-hour syndicated show at an ingest station and records it to a file," Coombs said. "That 'ingester' then sends the file to a central storage, such as a RAID-5 array with capacity for multiple terabytes, which holds hundreds of hours of program content."

From that point on, if it's scheduled to air, the file gets pushed from central storage to the main RAID-5 players which hold up to three day's worth of programming for air. The same file is also sent to a back-up player for that site which plays the file at the same time so that if the main player fails on air, the backup is instantly ready to take over on-air.

"Prophet designed NexGen so that any process that is cyclical—such as a program that is always recorded from satellite on Sunday at 10 p.m. but aired every Monday at 2 p.m.—is automated because computers handle repetitive tasks better than humans," said Dione Rigsby, assistant director of engineering for CCTV. "But processes that involve decision-making, like which programs to archive, are initiated by humans.

"Another process we feel requires human intervention is the decision to switch from the main player to the backup player in the event of a failure," Rigsby said. This can be done at the push of a button on-site, at the TOC, or even from a remote location.

NexGen has integrated asset management tools that warn the scheduler of conflicts, such as that the media usage has expired. And using SNMP protocols, there are quality control tools that warn operators about a wide array of technical anomalies anywhere on the pipeline. "Redundancy has been built into every aspect of the workflow, including the main database, routing switchers and players," Bock said. "Any failure of a particular box is immaterial to the operation of the total system."

Designed to use space judiciously, a single operator can monitor 100 or more channels from a space measuring only a few thousand square feet. Another cost saving measure is a gradual departure from large-screen monitors, such as plasma display devices, in favor of small VGA or LCD monitors placed right in front of the operator.

SYNERGIES FOR THE FUTURE

"Once this platform is in place, we may realize new efficiencies and benefits that we hadn't originally envisioned," DeClue said. "For example, our 20 news departments could easily share their news clips with other stations in the group. I imagine that our news and programming directors will appreciate using those resources if it can save money."

DeClue said that Clear Channel fully intends to make its hosting, provisioning and services available to the larger broadcast community.

"This platform will also enable us to be very creative in what we can do with our DTV sub-channels, maybe initiating innovative business models as a group," DeClue said. "We now have a tool in our hands which will allow us to react quickly and efficiently to changing opportunities in this industry, far more cost-efficiently than would have been possible using any other solution on the market." ■

Ultimately Tapeless

Rainbow digitizes with the Harris Invenio

by Robin Berger

BETHPAGE, N.Y.

Rainbow Network Communications is going tapeless, thanks to a readily accessible digital archive for its "bread and butter business," said John Barbieri, senior vice president and general manager.

The achievement caps an undertaking begun in 1996, when RNC started automating its systems using Harris Corp. products and expertise. Today, 18 Harris automation systems coordinate ingest and broadcast operations for 30 channels owned by Rainbow Media Holdings, a Cablevision subsidiary.

In 2003, RNC added the Harris Invenio media asset management system, running a final acceptance test plan before further developing the product throughout 2004, Barbieri said. Along the way other considerations—among them the launch, running and eventual sale of the Voom satellite-to-home HDTV business—slowed the project's momentum. But Barbieri insisted that the project is back on track.

At press time, RNC and Harris were planning out the test shadowing process for getting the archived content on air.

"Our third-quarter goal is to start pulling content from the archives for air for the national services we originate, AMC, IFC and WE: Women's Entertainment," he said. "Rainbow Media's sportskool, World Picks and Mag Rack VOD services are already utilizing Invenio as the backbone of their encoding operations," Barbieri said.

And over the last seven months or so the company has ingested a big chunk of content into the digital archives from AMC, IFC and WE, Barbieri said.

THE HARRIS-RAINBOW CONNECTION

Right before the turn of the century, when Barbieri was looking to digitize the company's assets, he couldn't find a product on the market to satisfy his requirements.

"We really delayed our decision-making process until they actually were able to show us a product, because it was really important that automation and media asset management be integrated," he said. "The product originated in France—we were one of the first to jump on board—pretty much their test lab for Invenio products."

At NAB2001, Harris announced that its Automation Solutions division had formed a partnership with Question D'Image, a French firm noted for its broadcast media asset management technology.

At the time, the QDI technology already incorporated metadata and media essence, included an intuitive FIND engine, and supported remote Web search. Moreover, Eurosport and TSR Television were already using it, according to a Harris press release. Harris acquired QDI last year.

It also entered into an agreement with Front Porch Digital to integrate the FPD DIVArchive and BitScream solutions (transcoder software for low-resolution proxy generation) into Invenio.

Harris confirmed its unique relationship with Rainbow.

Rainbow has spent most of this year ingesting content into its digital archives.

"Working with Rainbow, we developed the Invenio product to where it is today," said Harris director of sales, Marty Frange.

It's been a huge undertaking.

"There was a lot of pain that went into that process on both sides—it took a long time to develop the product to a point where it was meeting our expectations and, for that matter, Harris' expectations," Barbieri said. "They've got a nice product that they're selling to other people now."

Harris introduced the Invenio Asset Management Starter Pack at NAB2005. The scalable ingest and archive solution starts with three components: I-Media, I-Content, and I-Web.

I-Media ingests media from a variety of sources, defines it, and delivers it to servers, tape, or high-resolution storage devices, rendering it accessible from any workstation connected to a central database. I-Content enables user navigation and access and provides for registration, segmentation and the indexing of content. I-Web provides intranet or Internet access to all low-resolution representation.

WORKING OUT THE BUGS

"As with all cutting edge technologies, there were a lot of bugs and issues," Barbieri said. "Our business continued to evolve and Invenio needed to evolve with that."

Aside from the business evolution, there was a huge volume of data and metadata to contend with, as well as the growing number of resolutions the network needed to support.

"When you start applying a load to the system that's more in line with what you're going to be doing on a daily basis versus what you might be doing in a test plan," Barbieri said, "the system would fall down a bit—not crash; certain functions would not happen as expediently as we would want to happen or we would not get communication back from the system to say if something failed or if something actually occurred."

The issue was satisfactorily addressed last December with a software upgrade.

Also tricky was getting Invenio to interact with other technologies.

Barbieri said Harris and Invenio are communicating on various levels to other manufacturers' equipment—the Thomson Grass Valley Media Area Network, Diva products, Front Porch Digital's transcoders, FileMaker Pro database software and Windows Media 9 files.

"There's a lot of API interface between those various components, with Harris acting as the enterprise manager," he said.

The company also fulfilled requests to partition the database and provide security.

Barbieri said Harris successfully integrated the hub's content, traffic and scheduling system with Invenio, creating "an effective, user-friendly, paperless system for processing work orders and quality control information and other aspects of the back room process."

But new goals continue to arise, including plans for a disaster recovery facility, new archives-generated services, and an HDTV archive.

The game plan calls for rolling out instant access to content, B-roll and other assets by 2006. Designs for an HD archive are also on the drawing board for Rainbow's suite of high definition channels, "Voom 21," with plans for a media asset management system that will eventually be overlaid on top of it by 2006. RNC's Disaster Recovery Site plans should be realized somewhat sooner.

"We're looking probably by the end of the year to be transferring that content out to that site," Barbieri said. ■

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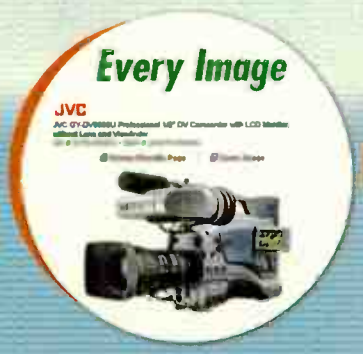

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RF TECHNOLOGY

Doug Lung

Elevating Accuracy in Longley-Rice Coverage

In past columns, I've discussed how incorrect assumptions and simplifications result in misleading coverage studies. Accuracy suffers when the actual antenna elevation pattern, including the effects of mechanical beam-tilt, is not used. While these simplifications may be necessary when analyzing interference between a large number of stations, using the most accurate data possible when designing a new broadcast facility reduces the chances of real-world coverage problems.

Suppliers of propagation software offer terrain data, usually in a compressed, proprietary format optimized for use with their software. Most Longley-Rice studies now use data based on the 3 arc-second National Elevation Dataset (NED) terrain data available from U.S. Geological Survey.

USGS datasets based on point spacing as small as 1/9 arc-second are available for more accurate studies, although I haven't seen this resolution used for broadcast studies. The terrain data by the FCC for OET-69 studies is available at *http://www.fcc.gov/oet/dtv/dtv_apps.html*.

THE VIEW FROM SPACE

In late May, USGS released the Shuttle Radar Topography Mission (SRTM) "finished" data in 1 and 3 arc-second resolution. This data was collected using dual Spaceborne Imaging Radar and dual X-band Synthetic Aperture Radar on board the Space Shuttle Endeavor in February 2000. The radars acquired two images at the same time, which were combined to produce a 3D image that contained the elevation data. This data, however, was of limited use without some post processing.

As readers know, some materials reflect microwave energy well and some materials absorb it. These variations caused "spikes" and "wells" in the data that were removed as part of the finishing process, which also included delineating and flattening water bodies, better defining coastlines and filling small voids.

The finished SRTM data has replaced the research-grade data in the USGS Seamless Data Distribution System (*http://seamless.usgs.gov/*). Research-grade data is still available from NASA's Jet Propulsion Laboratory (*http://www2.jpl.nasa.gov/srtm/*).

The research-grade data in JPL's initial release uses the unedited SRTM data for the 1 arc-second dataset, and averages the elevation over the nine 1 arc-second samples in each 3 arc-second cell to create the research grade 3 arc-second database. The 3 arc-second version of the finished dataset, however, subsamples the 1 arc-second data by using the value of the center cell of the nine samples, discarding the other eight samples.

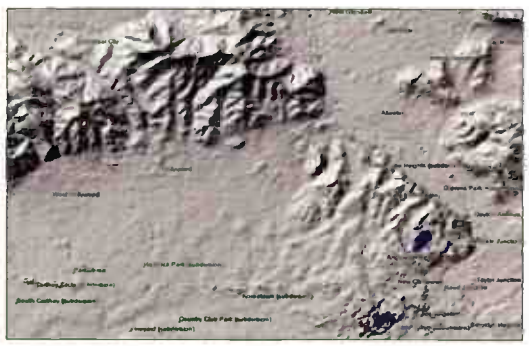

Fig. 1: SRTM finished data image of the Los Angeles area in 1 arc-second resolution

Fig. 2: An SRTM perspective with Landsat overlay of Manhattan, N.Y. courtesy of NASA/JPL/NIMA

If you look closely at Fig. 1 and Fig. 2, you will notice that unlike the NED, the SRTM terrain data includes large buildings that reflected the radars' signals!

How accurate is the SRTM data? One arc-second corresponds to about 30 meters in mid-latitude areas like the continental United States.

USGS says that the finished SRTM data meets the horizontal and vertical accuracy requirements of 20 meters (circular error at 90 percent confidence) and 16 meters (linear error at 90 percent confidence), and that vertical accuracy is actually closer to +/-10 meters. To see what the data looks like visually, visit *http://seamless.usgs.gov/* and play around with the interactive map (click on the U.S. map on the right side). This map will come up with default datasets, so you will want to modify them using the "Layers" menu on the right side of the page after you zoom into the area you are interested in. It is interesting to compare the SRTM data with the NED data.

If you look closely at Fig. 1 and Fig. 2, you will notice that unlike the NED, the SRTM terrain data includes large buildings that reflected the radars' signals! The SRTM elevation data also shows the height of heavily wooded areas. Dense forests will block UHF signals, but until the SRTM data became available, elevation datasets did not include the height of the forest canopy.

To get a closer look at these maps, view them at *http://www.transmitter.com/images/LA_Area_1_sec_SRTM.png* and *http://photojournal.jpl.nasa.gov/catalog/PIA02783*.

THE V-SOFT TEST

How much of an impact do buildings have on coverage? V-Soft showed the SRTM dataset integrated with its popular Probe 3 propagation software at NAB2005. I stopped by the V-Soft booth and working with two of the V-Soft engineers, I tested the software with a transmitter site in New Jersey west of New York City. The resulting map clearly showed the impact of the Manhattan buildings on the signal.

John Gray from V-Soft refined my quick experiment using a site most TV broadcasters in New York know well—the Armstrong tower at Alpine, N.J. Many TV stations used the site after the destruction of the World Trade Center on 9/11 until new facilities were constructed at the Empire State Building. This study is based on a hypothetical DTV station on Channel 40 using an isotropic antenna with its center of radiation at 286.5 meters AMSL and an effective radiated power of 30 kW. To highlight the impact of the buildings, only field strength levels above 70 dBµV/m were plotted.

The maps show signal levels above 70 dBµV/m as red, from 80 to 100 dBµV/m as green, and above 100 dBµV/m as yellow. The blue areas are water. Areas where the signal is less than 70 dBµV/m are white.

You will notice in Fig. 3, the map using the USGS NED 3 arc-second database, shows greater than 80-dBµV/m field strength over most of Manhattan and the western parts of Queens and Brooklyn.

However, when the SRTM data with the buildings included is used, as in Fig. 4, field strength drops below 70 dBµV/m in significant areas on the eastern side of Manhattan and the western part of Brooklyn. If you look closely at the sig-

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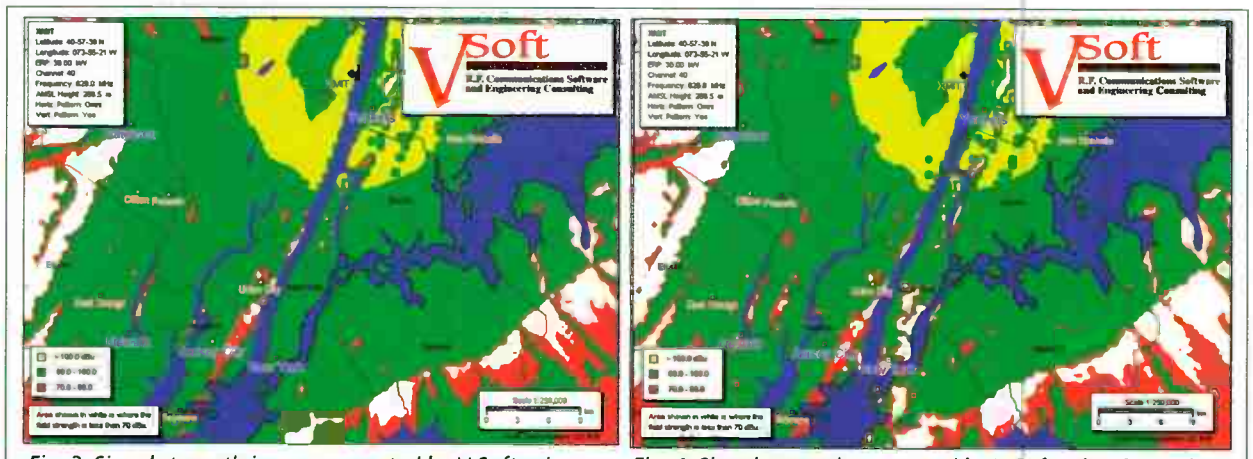
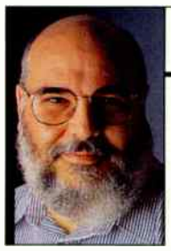


Fig. 3: Signal strength image generated by V-Soft using USGS NED 3 arc-second data

Fig. 4: Signal strength generated by V-Soft using SRTM data

SIGNAL STRENGTH

WHITE: <70 dBµV/m
GREEN: 80 to 100 dBµV/m
RED: >70 dBµV/m
YELLOW: >100 dBµV/m
The blue areas represent water.



LET THERE BE LIGHTING — Andy Ciddor

Taming the Harsh Elements of Softlight

Ever since I first picked up a 35 mm still camera in my late teens, I have been passionately attracted to the look of strong, directional softlight. In junior high school, I became involved with stage lighting, with its hard-edged ellipsoidal light, Fresnel spots and broad shadowless washes from banks of floodlights.

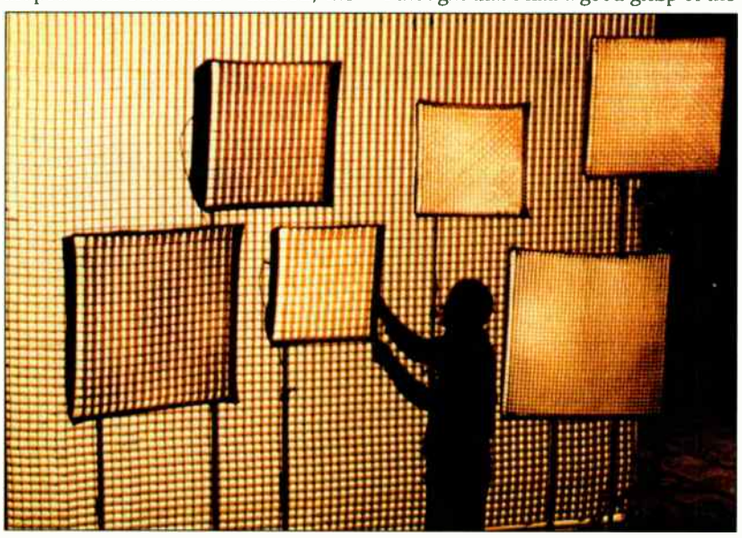
When I switched to television, the softlights I encountered were employed to fill hard shadows from Fresnel keylights or create that abstract shadow-free studio look that characterized so much of the wham-bam-thank-you-ma'am era of live television.

I finally found the light source I was looking for when I stumbled across heavily diffused nine-light minibrutes (molefays) used in TV commercials. When used for close-ups and talking heads, the minibrute has all the subtlety and finesse of football stadium lighting. However, two or more layers of tough-spun diffusion clipped to the barndoors turn this luminaire into a softlight that retains some of the directional characteristics of the PAR 36 medium flood lamps inside. If you keep the minibrute more than six feet from the subject (so he light doesn't wrap too far), it has many characteristics of indirect daylight.

Although I had found a source with naturalistic soft-edged shadows that was directional and sufficiently punchy to use as a keylight, my troubles were just beginning. Aside from being horrendously inefficient and bulky, the spill light from the diffuser simply blasts everywhere, hitting everything from the walls of the set to the glass on the Autocue and lenses of the cameras. Serious spill control is required if you want to light anything more than an isolated talking head or a simple product shoot.

French flags, cutters, C-stands draped with black tabs—indeed, the entire repertoire of beam control grippery is necessary if you want to make softlight sufficiently directional to light multicamera production. Fortunately, I once worked with a young and adventurous producer on a children's fantasy drama series and was given the chance to experiment with the softkeyed look. I was also fortunate in being able to convince the set designer to paint the walls of the sets in very dark tones to hide the spill light and give the scenes more atmosphere (just like the perps' apartments and crime scenes in "Hill Street Blues").

Despite all the support and cooperation extended by the entire production team, it really was just too hard to shoot. I thought that I had a good grasp of the intricate dance that is the cameras, mic booms, lighting stands, props, script assistants and floor crew moving around each other on a drama set. However, adding flags and C-stands and black drapery became disruptive. This, in turn, became exceedingly stressful for me, as I was anxious to make different-looking pictures without impacting on the usual tight scheduling constraints.



Lights outfitted with Lighttools Soft Egg Crates fabric grids

In effect, I was trying to get the look of naturalistic film lighting out of a three-camera studio production that required us to fill about 35 minutes of airtime each shooting day, complete with wizards, pyrotechnic effects and a few Muppet-like creatures. In the end, the pictures were noticeably different in the way that I was aiming for, although due to the inevitable three-camera compromises, not quite as contrasty as I had hoped. One thing that did become very clear to me was that directional softlight is difficult to manage in a cost-effective way.

In the world of film production, this has been acknowledged for many years and accounted for in the budgets and schedules of directors of photography (DPs) who want to use directional softlight. Given the wider contrast range of film, it was inevitable that DPs would chose to shoot some films using more naturalistic light sources than brute arcs.

Many DPs achieve this through the use of frames covered with diffusion material. The frame is lit from behind by something very bright, like one to three HMI heads or a handful of 24 kW Dinos (very large maxibrutes).

These large-area soft sources produce light that is effectively identical in shadow and directional quality to diffuse daylight. Like any other softlight, they spill absolutely everywhere and hence are accompanied by truckloads of grip equipment and busloads of crew. Tools to control the spill include skirts, flags and black drapes all over the place. Such setups require time, patience, skill and budget.

The softlights that we use for fill in the studio frequently have metal grids (often known as egg crates) to limit spill, but such devices are often bulky, heavy to move and have fairly limited effectiveness. However, the principle behind them is sound, and it has been picked up and improved upon by a number of luminaire manufacturers for newer, lightbox-style softlights pioneered by Chimera. Most makers of these softlights offer either a lightweight plastic grid (for low wattages only) or a flame-resistant cloth grid as a standard accessory.

CLOTH GRIDS

Lighttools in Edmonton, Alberta, Canada has taken the cloth grid further than just about anyone. The company developed a patented technique that requires very little sewing for making flame-resistant cloth grids. This has kept its price down to merely expensive, rather than totally unattainable. The lightweight fabric, compared with metal, has allowed them to experiment with much deeper and denser grids for softlights than has previously been tried. Lighttools has developed its "Soft Egg Crate" grids to give predictable beam angles of 30, 40 and 50 degrees for just about any softlight source, from a tiny portable RifaLite to a 20-by-20-foot overhead frame. The company even made entire walls of Soft Egg Crates for the Ifra Newsplex at the University of South Carolina.

Just think about it. Like the Fresnel spot, the ellipsoidal and the beamlight, the softlight can now be treated as a directional light source with a controllable beam. You can hit the talent with softlight without even grazing the set behind them, endangering the chromakey setup or causing lens flare on every camera in the building. This changes the fundamental nature of softlight.

DPs who use Soft Egg Crates over large softlight sources can dispense with the majority of complex grip gear, while using softlight in ways that were not previously conceivable for television production.

I'm just waiting for the opportunity to revisit the three-camera studio drama now that I really can have directional softlight. ■

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.


Photo: Steve Jordan

NET SOUP

Frank Beacham

FiOS: Telco Rolls Dice on the Big Pipe

FiOS, Verizon's new fiber-to-the-home network, is where Internet rubber meets the television road. Its success—or failure—stands to have huge implications for the direction of American communications throughout the remainder of this decade.

Ivan Seidenberg, chairman and CEO of Verizon, came to NAB2005 with one of those sugar-coated "invitations" that no doubt left many broadcasters shaking their heads and wondering "what next?" The telco mogul's pitch was one part carrot and one part stick.

First, the stick: There's a new sheriff in town and we're plowing ahead with or without you.

"FiOS will change the competitive landscape in the video marketplace, both now and in the future," Seidenberg told broadcasters in a keynote. "From day one, we'll offer a new technology, a new business model and a new customer experience."

Now that we have your undivided attention, the carrot: Broadcasters are Verizon's "natural partners" in exploring new digital technologies.

"As technology barriers fall, and we begin to marry the power of broadcasting with the mobility of wireless and the interactivity of the Internet, we'll offer a compelling customer experience that will give you many new ways to reinforce just how important you are in the lives of your audience."

Whatever Seidenberg meant by that, many broadcasters thought it sounded a lot like new competition. As quick as you can say "lobbyist," the NAB had a member on Capitol Hill warning of the grave dangers of a big interactive digital pipe to broadcasters.

"Stations would lose audience share and advertising dollars, and these dollars fund local programming that makes broadcasting valuable," Greg Schmidt, vice president of new development for LIN TV, who testified on behalf of the NAB at a House hearing.

The all-fiber network has long been considered the holy grail of interactive communications.

He then proposed a laundry list of restrictions that Congress should impose on the telcos: Local broadcasters must remain the only source for network programming; fiber providers must be required to "black out" the availability of certain sports games; and local TV broadcasts must be carried on fiber networks.

One can only imagine the reaction to that list by network visionaries such as Robert Wright, the NBC chief who just made a deal with Verizon to put the NBC broadcast and cable networks on FiOS. In the meantime, Verizon is not in a mood to debate broadcasters over its own lightning-fast DTV transition. The telco is not only rapidly signing up premium program services for FiOS, but is also busy building—house-by-house—one of the most expensive and advanced communications network ever deployed in the United States.

FIBER COMES HOME

Although fiber-optic technology is common for long-distance and intercity communications throughout the telecommunications industry, Verizon is one of the first major telecoms to begin using it to directly connect homes and businesses to the network on a widespread scale.

The all-fiber network has long been considered the holy grail of interactive communications. Fiber has sufficient bandwidth for high-speed Internet access, telephone service and a wide array of video services—including HDTV. Though the television offerings are scant at this early stage, current customers can already acquire Internet service at speeds of 30 Mbps downstream and 5 Mbps upstream.

To help build the network across the country, Verizon will hire between 3,000 and 5,000 new employees by the end of this year. In South Plainfield, N.J., the

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TECHNOLOGY CORNER **Randy Hoffner**

Is Film Becoming an Endangered Species?

In 2002, this column rhetorically asked if film was dead once again. Since the videotape recorder appeared on the scene in the 1950s, there have been repeated predictions that film would be replaced by video. Indeed, the manufacturers of video equipment have made a number of attempts to do just that. Video successfully supplanted film in newsgathering long ago, but in spite of the video recording industry's best efforts, film prevailed as the capture method for theatrical movies and primetime television. That tide appears to be turning.

There is no disputing it's an increasingly digital world. I recently encountered a photographer from The New York Times who was not carrying a Graflex press camera with a big bellows on the front and a flashbulb the size of a 60 W household light bulb screwed into it.

She was in fact carrying a Canon EOS 1Ds Mark II digital single-lens reflex camera, which is, it turns out, standard issue at the newspaper.

HD VERSUS FILM

When HD video made its appearance, some thought it would swiftly replace film. But there were several reasons why this did not happen. One of the most popular arguing points about film and HD video concerns resolution, but the resolution argument is not as relevant as some would have us believe. There are several other ways that film and video differ. In earlier days, HD video recording was done only at 30 fps interlaced, or 60 fps progressively scanned. Interlace artifacts are significantly undesirable, to be sure, but the 30 and 60 Hz frame rates made video unacceptable in most creative storytelling situations.

Most of the film shooting for feature film and television is done at 24 fps. This means that when this material is converted to 60 Hz-based video, 2:3 pulldown must be introduced, and 2:3 pulldown imparts temporal artifacts. It is, however, the way a lot of television programming is broadcast.

When it became possible to shoot 1920 x 1080 x 24 fps video, this constituted a breakthrough for the dramatic television storyteller. The resulting video has the temporal "look" that 2:3 pulldown imparts. Regarding spatial resolution, 1920 x 1080 is generally deemed to be an adequate mastering resolution for television broadcast material. We have all also recently heard about some notable theatrical movies produced and directed by notable producers and directors that incorporate 24p video material. Some of the advantages it offers include instant dailies and a high degree of compatibility with high-resolution computer generated imaging.

A significant hurdle in much television and cinema acquisition is caused by the size of the video imager, compared to the image size of 35 mm film. This is important not simply because the larger the imager, the larger the pixels can be, and therefore the higher the signal-to-noise ratio that can be realized. It is also important because image size affects the focal length of the lens, and, thereby, the depth of field that is seen in the captured images.

LENS PARAMETERS

Two key parameters of a lens are focal length and aperture. Focal length is the distance from the lens to the focal plane of the imager or film, and aperture is the usable diameter of the lens opening. The relationship between focal length and aperture, the focal ratio, is the focal length of a lens divided by the aperture diameter.

A simple example would be when the focal length of a lens is 50 millimeters, and the aperture or diameter of the lens is also 50 millimeters, which would correspond to a focal ratio of 1.0. While such lenses do indeed exist for 35 mm single-lens reflex still cameras, they are rare, as this is an unusually large aperture for such a lens.

As the aperture diameter increases, the cross-sectional area of the lens becomes geometrically larger, and it becomes increasingly difficult to maintain image quality over the entire lens area, particularly at the outer edge of the lens. Thus, as the aperture diameter increases, the lens becomes increasingly difficult and expensive to manufacture. Typically, a focal ratio around 1.8 or 2.0 is the lowest found in practice. For a lens with a 50 millimeter focal length, a focal ratio of 2.0 corresponds to an aperture diameter of 25 millimeters. If 25 millimeters is the maximum aperture of the lens, then adjusting the iris so that 10 percent of the aperture diameter is used, or an aperture diameter of 2.5 millimeters, this produces a focal ratio of 50/2.5 millimeters or *f*/20.

In 2002, a group of industry professionals held a shoot-out to compare 24p video film.

Irises are not continuously adjustable, but are adjustable to specific aperture diameters that we know as *f*-stops.

In the example just cited, the nearest *f*-stops would be *f*/19, corresponding to an aperture diameter of about 2.63 millimeters, and *f*/22, corresponding to an aperture opening of about 2.27 millimeters.

When a lens is focused on a subject, the subject is the most sharply focused component of the picture. But objects that are both closer to and farther away from the camera than the subject will also be in acceptable focus. The range of distance in front and behind the focused subject within which objects are in acceptable focus is called the depth-of-field. Depth-of-field varies inversely with the lens aperture, the distance to the focused subject, and the focal length of the lens, respectively.

Another way of saying this is that the more distant the focused object is from the lens, and/or the smaller the lens aperture, and/or the shorter the focal length, the greater the depth-of-field. The linear size of the image that is projected by the lens onto the focal plane—the spot where the film or sensor is located—is equal to the photographed scene's angular size (the angular field of view of the lens), multiplied by the focal length. If we wish to project a smaller image on the focal plane while holding the angular size of the photographed image constant, thereby giving us the same apparent distance from the viewer and the same photographic magnification, the focal length of the lens must decrease.

Until recently, all available 24p video cameras used sensors with dimensions that are smaller than those of a 35 mm

film frame. Even if a standard 35 millimeter lens is used, the smaller image dimensions cause this lens to have a shorter effective focal length than would be the case if 35 mm film were used. This in turn results in greater depth-of-field. Greater depth-of-field is desirable for some situations, such as landscape photography, but it is usually not desirable in dramatic cinematography.

USING SELECTIVE FOCUS

One of the time-honored mechanisms in cinematic storytelling is the use of selective focus. The foreground, or the area on which the director wishes our attention trained, is held in focus, while the background, or less relevant portions of the image, are intentionally defocused. The attention of the viewer is shifted from one subject to another within the frame by defocusing one subject and refocusing on another. Selective focus is much easier to achieve using 35 mm film than electronic imagers, because the focal length of the lens in this case is relatively long, giving a shallow depth-of-field even when the iris is stopped down.

Possible ways to mitigate this problem include bringing the subject closer to the lens, and opening the iris as much as possible. The most effective solution is to make the imager larger. As 24p shooting is being increasingly used, it is not surprising that 24p cameras with full 35 millimeter imagers have appeared on the market.

When this column asked, three years ago, if film was dead again, some television shooting was being done in 24p video, but little was for dramatic programming. That worm has turned, and it is not uncommon to see dramatic footage shot on video today. Film stock continues to improve, and the "film look" is still highly desirable, but the convenience of video shooting and post production is alluring, and in many respects the gap between the "film look" and the "video look" is narrowing. We now know a lot more about the MTF, gamma, and dynamic range characteristics that make film look the way it looks, and HD camera manufacturers are engineering into video cameras the parameters that make them simulate film. Some of these parameters are particular modulation transfer function and gamma characteristics. We may expect the depth-of-field problem to be overcome, too, when video cameras with 35 millimeter-frame-sized sensors become available.

We can almost glimpse the day when film shooting for television and feature films will become a boutique activity. Old habits die hard, but 24p video shooting is becoming increasingly common. ■

Randy Hoffner is a broadcast technology manager in New York. Write to him c/o ***TV Technology****.*

FiOS

CONTINUED FROM PAGE 29

telco is training about 160 new fiber installers each month. Jeffrey Batiste, a 10-year veteran trainer of the new generation of fiber installers, told the Associated Press:

"You have to compare this to other major milestones within the industry. This is as significant as when they began stringing wires across the country or bringing a telephone into every home."

HIGH-TECH PIONEERING

In a recent report by NorthJersey.com, Verizon's FiOS fiber installation process was described as a cross between high-tech pioneering and low-tech grunt work.

Take the recent FiOS installation at the home of Brendan O'Reilly in Harrington Park, N.J. According to NorthJersey.com, a technician plugged into the neighborhood's fiber network and strung the line to the side of the O'Reilly house, where he attached a new box called an Optical Network Terminal (ONT). Three types of wires come out of the ONT: one for phone, one for Internet and a third for future TV services.

A smaller box with a backup battery was installed inside a laundry room. This box, which needs to be plugged into an electrical outlet, keeps the backup battery charged and provides the low-level current needed to run O'Reilly's telephones for eight to 10 hours. The battery has an expected life of about two years and O'Reilly is responsible for replacing it.

After a few minor glitches, the O'Reilly installation—including a wireless home network—was complete in about four hours. However, O'Reilly, a soft-spoken area police officer, installed FiOS mainly for its high-speed Internet connection. For now, at least, he plans to keep his current Cablevision service for television viewing.

Like most customers, O'Reilly wants to see how well Verizon performs as a program provider, especially in the area of sports coverage, before he shuts down cable and depends on the FiOS network for all of his TV.

That, in a nutshell, is Verizon's real FiOS challenge. Since day one—no matter how good the technical attributes of a network—television has been driven by one thing: the quality of the programming. That hasn't changed and never will. ■

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

MEDIA SERVER TECHNOLOGY **Karl Paulsen**

Fibre Channel Fends Off Competitors

Fibre Channel data rates are about to double—again. This 10-year-old server and storage connection technology has grown from 1 Gbps to 2 Gbps, and now products are available that bridge the 4 Gbps domain.

The impact of these advances on media server storage systems is in the added bandwidth for large-scale SAN configurations. The ability to provide disk throughput is perhaps the highest priority for large blocks of streamed or FTP'd data in media server architectures.

Fibre Channel connection technologies are more flexible and at least three times faster than SCSI, which is restricted to short-distance cabling and parallel interfaces. Speed and flexibility make Fibre Channel far more practical for medium- to large-scale storage systems. It can be deployed in point-to-point, switched and loop interfaces; and it is designed to interoperate with SCSI, Internet Protocol and other protocols.

In its early implementation, Fibre Channel was badmouthed, often plagued by differences in the interpretation of specifications between disk drives, controller interfaces and other components. Those early incompatibility issues have all but vanished, clearly placing Fibre Channel into the mainstream for modern storage architectures.

BORN IN PRE-PRESS

It was the prepress industry in the mid-1990s that hailed Fibre Channel because the technology enabled large image files to be moved between workstations and specialized processors for printing.

In the early years, designs for fault-tolerant mechanisms that could reroute around failed cable loops signified one of its principal advantages. Yet many years passed before those capabilities were properly applied to a transparent failover architecture supported in software.

Some first-generation video servers employed shared storage across multiple channels by using dual-arbitrated loops that enabled this transparent failover concept. The concepts were effective, and it marked the beginning of what is now a universally accepted architecture for storage industrywide.

Fibre Channel connectivity has grown significantly. For short-distance interfaces, Fibre Channel interconnections can be deployed on coaxial cable or UTP (unshielded twisted pair) cabling, and now these interconnections can be separated by a much as 10 kilometers when connected over optical fiber.

In campuswide implementations, Fibre Channel further enables the consolidation of high throughput to centralized storage—a topology now widely deployed and accepted in massively large media server storage systems.

In a parallel development path, and before the widespread acceptance of storage area networks (SAN), the predecessor, network attached storage (NAS), employed Ethernet. Unfortunately, NAS, with its low 10 Mbps throughput, made Fibre Channel unsuitable for many applications when compared to direct attached storage (DAS), which was upwards of 20 times faster at the time.

REACHING 10 Gbps

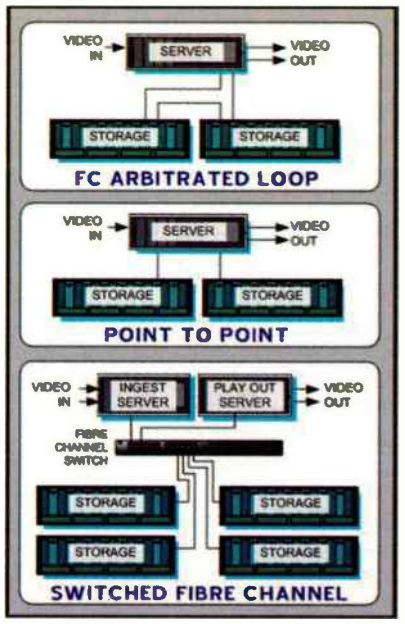
There is now clear evidence that both Fibre Channel and SANs are here to stay. Around mid-2004, 1 Gbps Fibre Channel platforms were squarely headed toward a 2 Gbps storage and distribution transition.

But by the time this transition was firmly rooted, several manufacturers had already started to demonstrate host bus adapters (HBA), disks and switches that could operate at 4 Gbps. Today, some startup manufacturers are already dabbling in 10 Gbps Fibre Channel!

As mentioned, Fibre Channel technologies are particularly important to the SAN. To implement a dedicated, high-performance storage network with high-volume data transfers, Fibre Channel's high transfer rates become critical to success. Given that a SAN can have a high degree of sophistication, management complexity and cost, most large-scale SANs are traditionally implemented for mission-critical applications in the enterprise space.

Systemwide storage area infrastructures that connect storage devices (NAS, DAS, RAID arrays or tape libraries) to servers now generally employ the gigabit technologies found in Fibre Channel.

Consider that only four years ago, the cost-per-port for a 10 Gbps Ethernet switch approached $50,000; two years ago that price dropped to $5,000.



Fibre Channel, based on specs in the Fibre Channel Physical and Signaling standard, can be found under ANSI X3.230-1994, aka ISO 14165-1.

Using Fibre Channel, server/storage combinations enable simultaneous communication among workstations, servers, data storage systems and other peripherals—free of the distance and bandwidth constraints of SCSI.

While DAS and NAS are generally optimized for data sharing at the file level, SANs are superior in their ability to move large blocks of data. It is this combination of SAN/Fibre Channel technologies that enables the kind of bandwidth-intensive transfers found in media-centric applications.

These same principles are similarly applicable to activities such as database, image and transaction processing. Furthermore, the SAN enables a distributed architecture that offers the highest levels of performance and availability, better than other storage mediums available.

A SAN, in concert with Fibre Channel connectivity, also will dynamically balance loads across the network, a key to providing fast data transfer with reduced latency at the I/O level. For media server applications, this permits large numbers of users (i.e., encoders, decoders and workstations) to simultaneously access centralized data without creating bottlenecks.

That's not the end of the story. Today, those advantages originally found only in Fibre Channel continue to blur as other technologies adopt similar attributes (e.g., Gigabit Ethernet, iSCSI and more). For example, on a campuswide level, iSCSI offers identical performance for common tasks such as backup.

Still, confusion continues whereby the term "SAN," which originally applied to a Fibre Channel connected network, has become de-emphasized by its common usage. So now we add confusion with the terminology of "IP-SAN," which usually refers to iSCSI and uses Ethernet and not Fibre Channel as the underlying transport in a local area network.

The battle between Fibre Channel and iSCSI will continue to brew because even though iSCSI is cheaper, 4 Gbps Fibre Channel is faster. That said, those differences may diminish as 10 Gbps Ethernet development and the port cost for switches drop.

PRICES COME DOWN

It was only recently that 10 Gigabit Ethernet carried a hefty price tag, but as production begins to ramp up, the new 10 Gbps products will make for a higher volume push into the Fibre Channel arena, yielding a more compelling reason to consider iSCSI deployment.

These kinds of trends continue. Media servers are now pretty much standardized with Fibre Channel storage connectivity, Gigabit Ethernet interfaces for file transfers, and 300-plus GB hard drives. The switches that integrate these connections are also part of the total cost of deployment.

Consider that only four years ago, the cost-per-port for a 10 Gbps Ethernet switch approached $50,000; two years ago that price dropped to $5,000. Industry forecasts for 2005 suggest the price will reduce to around $1,000 per port. By contrast, the cost-per-port for a 4 Gbps Fibre Channel enterprise-level switch looks to be only about $800 to $1,200.

It's clear that as media server technologies evolve into much larger mass storage devices, the current practice of separating low-resolution images from full-bandwidth pictures is less certain, and "online" versus "offline" seems to get fuzzier.

At the point where the image size in terms of bits becomes inconsequential, this can only produce positive results for the media content creation and distribution industries. The recent trend toward low entry-cost high-definition production may now become more accelerated as storage bandwidth increases and the costs decline. ■

Karl Paulsen is vice president of engineering for AZCAR. Contact him at karl.paulsen@azcar.com.

INSIDE AUDIO — Dave Moulton

Suddenly Inundated With Surround Work

Over the past couple of months, professional things for me have been happening on a lot of fronts. It's worth sharing because it bodes well for all of us in the 'biz.

I've been into surround sound for a long time—composing electronic music since the early 1970s, teaching, demonstrating, and recording. It's mostly a labor of love. My bread-and-butter has been in stereo work, but things have changed.

Dave's BeoLab 5 setup

About a year ago, the Orchestra at Indian Hill, based near Boston, asked me how concert recordings could be improved. After I made some recommendations and did some mastering for them, I was asked to produce their recordings for the next several years. I was also asked to investigate surround recordings. We have our first season of surround recordings in the can. Hot diggity!

Meanwhile, the producer of an album of rather unconventional multitrack-based choral music with an extremely eclectic range of styles—Middle Eastern, reggae, gospel, rap, folk, handbells and new age electronica—came in to have me evaluate her tracks and mixes. I was then hired to remix the album. About two tunes into that project, I asked if I could cop a surround mix for my own amusement. After some discussion and demonstrations, she green-lighted a shift to a Super Audio CD hybrid release and asked me to do the surround mixes as well. Just last week I signed off on the test SACD from Sony, and release was scheduled for June 11. ("From Exile to Exaltation..." Dissonance Resolved Records).

SACD IN THE STUDIO

All this finally led me to install a "universal" CD/DVD/SACD player in the studio. Once I got it running (a lot of fun without a video monitor, by the way) I found myself playing everything I could lay my hands on. This led to dragging all sorts of DVDs into the studio and playing them without video, a most illuminating experience.

My room is a really nice high-end music post-production space, with a full-bore all-digital surround monitoring system that includes five BeoLab 5s and a prototype overhead loudspeaker that is almost as good as the one at BeoLab; 15 kW of power, extended LF response to 12 Hz, plus full LF room calibration capability. It's a beautiful thing to experience.

Someday, I intend to add video capability, but for now it's audio only. So, I started actually "listening" to movies, with the same sort of critical analytic processes I use with clients' music. It's amazing what you can hear when you're not distracted by the on-screen visuals. It's even more fascinating when you can also observe or solo/mute the contents of any channel.

Alert readers will recall that I've been ranting about the difficulties consumers must have setting up their home theater systems. I've reviewed the broad middle class, citing sales and support practices at Cambridge Sound Works and Tweeters.

Well, as they say, be careful what you wish for! About a month ago, I was approached by a firm specializing in "intelligent home" systems that offers turnkey home theaters. The firm, Cutting Edge Systems of Westford, Mass., retained me to tune those systems.

These are purpose-built rooms, usually done by an architect, with considerable attention paid to acoustical issues as well as visual ones. Cutting Edge prefers to use soffit-supported or high-performance in-wall speakers behind fabric covers. The rooms are quiet, comfortable, gorgeous and surprisingly pleasant, and now that I've worked in a couple of them, suffice to say—I want one!

Setup and tuning remain complex, difficult and confusing, with many questions about the various behaviors of the front-end processors, which may not be at all obvious. Even with really good instrumentation, I found that getting the room to sound really decent takes a day! Definitely not plug-and-play, nor for the faint of heart or for amateurs!

The upside is that when such a room has been appropriately tweaked, the cinematic experience is stunning.

I'm fascinated and gratified to be encountering so many aspects of the surround-sound experience. I'm finding the following verities:

I've been into surround sound for a long time —composing electronic music since the early 1970s, teaching, demonstrating, and recording.

Those who produce audio are treating the low-frequency effects channel very conservatively. The bulk of the LF experience lives in the main speakers.

The surround channels remain very "tender" to different treatments. How they are used varies widely in music and film. What clients desire is fairly variable, except they definitely want to be able to hear them! Music folks are also treating the center channel quite tenderly, while it is a mainstay for movies. The best systems use identical speakers all the way around, but particularly across the front.

The surround experience is far more visceral and satisfying than stereo, by quite a large margin.

Finally, this surround sound/home theatre business is beginning to get some real traction. There are some excellent music recordings out there, in a variety of formats, there is a wonderful array of films on DVD with excellent 5.1 surround capability, and there are consumers who are quite passionate about all this, and who are investing large sums of money in getting the playback they desire. I don't think this will ever get pushed back into the bottle. Stay tuned. ■

Dave Moulton is less out of polarity than usual. You can complain to him at his Web site, www.moultonlabs. com.

ATSC UPDATE

Jerry Whitaker

Work on Digital ENG Communications Begins

The ATSC has begun work on defining the basic parameters for digital electronic newsgathering (D-ENG) communications systems. This work is being done in the Specialist Group on Digital ENG Communications (TSG/S3), under the leadership of Dane Ericksen of Hammett & Edison Consulting Engineers. Ericksen is representing the Society of Broadcast Engineers (SBE) on the committee.

TSG/S3, under the supervision and direction of the parent Technology and Standards Group (TSG), will develop voluntary standards and, where applicable, associated recommended practices for private communications services between DTV station facilities and their associated crews (using a portion of the 8-VSB broadcast signal) and from an ENG receive site to an ENG crew (using one or more of the 40, 25- kHz data return link (DRL) channels created by the FCC in ET Docket 95-18 Third Report & Order). As with all other ATSC standards, wherever possible, the new specifications will build upon existing standards.

An important element of this activity includes liaison with various ATSC specialists groups, specifically with TSG/S8 (transport and multiplex) and TSG/S13 (data broadcasting).

TSG/S3, like most other ATSC specialist groups, conducts most of its meetings by teleconference to minimize the travel burden on participants. Draft documents and technical discussions typically take place on e-mail reflectors, giving all members of the group the opportunity to contribute to the work and offer their opinions on how the specifications should evolve.

WORK PLAN

Work within the Specialist Group on Digital ENG Communications will initially be focused on the following projects:

Development of a standard or recommended practice to facilitate remote ENG communications services from a DTV station to a remote ENG crew, utilizing the ATSC transport stream. This work will be based on input from the ATSC Planning Committee.

Development of a standard or recommended practice to facilitate return link communications from an ENG receive-only (ENG-RO) site and an originating ENG platform communicating with that ENG-RO site. This system will include signal identification and control system functionality.

Development of an emissions mask measurement recommended practice for DRL and BAS channels.

The work plan to accomplish these projects is still under discussion and review. However, it is hoped that both the ENG communications services specification and the ENG-RO specification will be ready for formal consideration as a candidate standard by late September. A candidate standard is a specification that has received significant review within a specialist group. Advancement of a document to candidate standard status is an explicit call to those outside the related specialist group for implementation and technical feedback.

This is the phase at which the specialist group is responsible for formally acquiring that experience, or at least defining the expectations of implementation. The parent technology group must approve advancement to candidate standard status. Candidate standards typically advance to proposed standards and finally to approved standards in a series of steps, which include votes—first, by the Technology and Standards Group, and second, by the full ATSC membership. If all goes as planned, the approved standards could be finalized by early next year.

Work on development of the emissions mask recommended practice is dependent on completion of the other two projects, and so it will follow sometime later.

REMOTE ENG

It is clear that broadcasters have a need for private communications between their DTV station facility and ENG crews that are equipped with ground-based and airborne ENG microwave systems. Current and future requirements include the following:

Interruptible foldback (IFB) and communications using voice-over-IP (VoIP) with defined quality of service (QoS).

Network access to newsroom management systems, e-mail, file transfers and Internet access.

Remote vehicle location data (GPS) to the station (via the incoming ENG signal) and return acknowledgement (via the broadcast DTV signal or a DRL channel).

Metadata to/from the station to the newsroom production systems.

Remote control of various types of equipment.

The developmental focus of ATSC will be on utilization of the DTV signal to provide communications to the remote vehicle. Standardization of communications from the vehicle to the DTV station will be by reference to other specifications.

Time is of the essence for broadcasters and the manufacturers of 2 GHz TV BAS radios to put the DRL channels to good use.

ENG-RO BACKGROUND

As mentioned earlier, when the FCC adopted the SBE suggestion to create two 500 kHz DRL bands at the lower and upper edges of the re-farmed 2,025–2,110 MHz TV BAS band, a total of 40 25-kHz DRL channels were created—20 each in the lower and upper DRL bands. These channels will allow a feedback or return link to be established from an ENG-RO site to an originating TV pickup station (usually an ENG truck). The link would allow automatic transmitter power control (ATPC) by ENG trucks and a more efficient usage of the seven 2 GHz TV BAS channels.

However, the FCC did not adopt any new technical or operating rules for DRL channels. There is accordingly a need for documentation to be developed, with the expected end result being a voluntary standard on DRL channel systems.

Time is of the essence for broadcasters and the manufacturers of 2 GHz TV BAS radios to put the DRL channels to good use. But first, all need to agree on the basic technical standards, protocols/signaling and certain operational issues. Priority issues that need to be resolved include:

Basic system parameters, such as modulation type, occupied bandwidth, EIRP, emission mask and frequency stability.

Protocols and signaling. It is expected that established communications protocols will be used—applied or modified as necessary to accomplish this task.

Operational issues, such as the form and type of data transmitted, priority of messages and station identification.

BECOME INVOLVED

ATSC specialist groups are open to all individuals and organizations with a direct and material interest in the work. If you would like to contribute to this effort, please contact Dane Ericksen at dericksen@h-e.com or the author directly. ■

Jerry Whitaker, is vice president of the Standards Development for the Advanced Television Systems Committee.

Longley-Rice

CONTINUED FROM PAGE 26

nal strength in New Jersey, you will notice some reduction in coverage, possibly from forested areas.

Visit the V-Soft Web site at *www.v-soft.com* for more information on its products using the SRTM data. Now that the finished data is available from USGS, I expect other companies to offer SRTM terrain databases with their propagation software.

Since there are holes in the SRTM coverage and a certain amount of "noise" in the data, it is worth asking how the database handles this. A comparison with USGS NED elevations could eliminate elevations that are impossible in nature, but care is needed not to eliminate buildings. Averaging can be used to reduce the noise, but could also have the effect of reducing the height of buildings or other small obstructions.

Although my focus this month has been comparing USGS NED elevations with those from SRTM, SRTM elevation data covers most of the world. In many areas, terrain elevation data is inaccurate. SRTM data will allow engineers designing facilities in these areas to more accurately determine the best transmitter locations, optimum antenna patterns and number of transmitters needed to coverage an area.

One final note—if you downloaded the SPLAT software I described in my column in the Feb. 2, 2005 issue, (also available at *www.tvtechnology.com*), you are probably wondering whether you can use the freely downloadable SRTM data in SPLAT.

Unfortunately, I haven't been able to find a utility to convert the formats available on the USGS Seamless Data Distribution System (ArcGrid, GeoTIFF, BIL and GridFloat) into the SPLAT Data Files. If you find a way to convert the SRTM supported formats into the SPLAT SDF format, please let me know.

If you had trouble finding the 3 arc-second, 1 degree, 1:250,000 elevations files used with SPLAT, try *http://edc.usgs.gov/geodata/*. USGS has indicated distribution of DEM files will change June 30, 2005. See *http://edc.usgs.gov/DEM_DLG_discontinued.html* for more information. It appears the files will still be available for a fee through the USGS EarthExplorer. ■

Your comments and questions on any RF topic are always welcome. Drop me an e-mail at dlung@transmitter.com.

ENG LENS

Canon 17x7.7 ENG Lens

by Frank McDermott

From the early days of electronic newsgathering when we made the transition from the mechanical news film cameras of the 1960s and 70s to the all-electronic format of the BVU system, our equipment has evolved systematically and incrementally. The miniaturization of components allowing a camera or tape deck to do more in a smaller package has now been extended to the optical end of ENG—the lens itself.

FEATURES

The new 17x7.7 lens is the latest in a long line of Canon lenses that have shown steady advances, in optical design, ease of operation, photographic versatility and ergonomic comfort.

This lens represents Canon's latest effort to forge the great compromise between an acceptable telephoto range and a highly desirable wide-angle specification with a short minimum object distance.

News photographers want it all, and they want it all in a lightweight, easy-to-use package. This lens comes very close. The long end at 131 millimeters that can be doubled with the 2X extender is long enough for most needs, and the wide end at 7.7 millimeters is wide enough to shoot effectively in limited areas, such as moving vehicles or in our small offices.

Of course there are occasions when a longer focal length would be nice and we could always use a couple more millimeters on the wide end, but for most of us who only have the use of one lens, this lens can do it all.

The feature that sets this new line of Canon lenses apart is the new information window that is built into the servo housing right above the VTR start button. This information display not only displays various lens functions, it includes a menu-driven minicomputer that will customize virtually any lens function for one or multiple lens users.

What this means is that the various buttons, including the main lens see-saw switch that traditionally controls zoom direction and speed, can be mapped to change their functions for a specialized need or use. This is a radical departure from a lens with an auto/manual iris and a single-speed zoom. To put this radical departure into perspective, there is even an additional manual for the information display. As I became familiar with the operation of the user-changeable features, that manual became essential to "learning" the scope of this new lens.

The Canon 17x7.7 features an information display that not only shows various lens functions, it includes a menu-driven minicomputer that will customize virtually any lens function for one or multiple lens use.

IN USE

A button lights up the small screen and an additional small button enables the user to toggle through the myriad settings. These settings include the ability to change zoom speeds and memorize a particular speed, changing zoom end stops and memorizing end stops. These zoom features will be particularly useful for the photographer working in a studio environment shooting the same shots for multiple takes in a promo shoot, for example. One immediately notices that the servo housing has more buttons than in previous models, including two buttons labeled "Aux 1" and "Aux 2." These can be used for a variety of functions, including VTR start, return video and framing preset. In that same vein, other functions can be assigned to the main VTR start button, the return video button, and the zoom

CANON, PAGE 40

FAST FACTS

Application
ENG and EFP

Key Features
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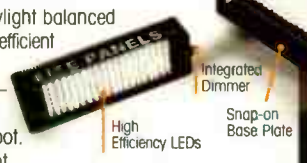

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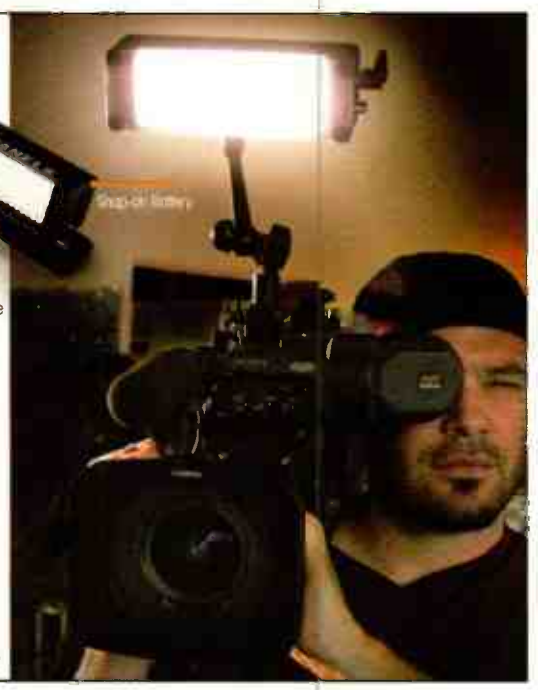

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EYE ON FURNITURE

Racking Up a Great System

by Bob Kovacs

One of the most overlooked components in any television system is the simple equipment rack. If you have more than two pieces of gear, chances are that your system will look and work better if the equipment is installed in a rack.

Although racks come in many shapes and sizes, the most common in the television industry is the 19-inch rack, which can be used to mount gear that has front panels that are 19 inches wide. The rack has two rack rails with properly spaced screw holes that are used to firmly attach your system's components.

Anyone who has set foot in a technical facility has seen racks filled with equipment, so what more is there to say? Plenty, actually.

Just as a lined sheet of paper gently prods you to physically organize your writing, an equipment rack physically forces you to organize your television system. Done right, the use of equipment racks results in a system that contains the least cable and has the highest performance. In addition, racks bring a stiff mechanical structure to the party that helps protect your gear from the assault and battery of daily operation.

BACK TO THE BASICS

The basic equipment rack is a vertical structure, usually made of steel that has two parallel rack rails. These rails have screw holes spaced in the normal EIA pattern to permit installation of equipment built to the standard "rack unit," which is 1.75 inches (44.5 mm) tall.

The term "rack unit" is abbreviated to RU and is often shown on equipment specs as simply "U." Thus, a piece of equipment might be described as fitting in 4 RU or 4 U; you now know that is 7 inches of rackspace.

Racks built for the television industry, and indeed most technical industries, use standard screw-hole spacing and size. A screw that fits in one rack should fit into any other rack that uses the same standard EIA screw-hole spacing and size. A few oddballs are out there, however, and it's always wise to double-check this specification before ordering racks for your system.

TBC Consoles' intelliTrac Rack Cart.

Some manufacturers have rack rails that are tapped and threaded, ready for screws to be inserted. Other manufacturers use rack rails with punched-out holes; nuts are clipped over these holes in every location in which a piece of equipment is installed. If you order one of the latter, make sure that the rack comes with a supply of nuts—you won't get far without them.

By the way, don't forget the screws. Believe it or not, you won't get them unless you ask for them.

Racks come in an often bewildering medley of sizes, configurations and options. If you really need a 1 RU rack, you can get it. At the tall end, racks up to 44 RU are common and just about everything else to finish or dress up a rack is available.

For example, side panels and rear doors are often optional, as are tops and bottoms. If you install two racks side-by-side, you probably don't want side panels where the two racks touch each other. A monitor wall of 10 equipment racks needs only two side panels: one at each end.

Other common options for racks include vented top panels, locking rear and front doors, pedestal bases, power strips, countertops, cable management systems and trim/appearance features. There are hundreds of possibilitie to keep this in mind when ordering racks.

A full-size steel equipment rack fitted with side panels is a heavy and unforgiving object that needs a couple of strong people for safe-handling. Filled with equipment, it requires a forklift—something to think about if you need to load racks using an elevator with only a hand truck.

Racks are also available in kits that require assembly. These can work out particularly well if you have small doors or elevators that prevent passage of a full-size preassembled rack.

Fully stuffed, a 10-rack monitor wall will put an impressive amount of weight on your floor. The weight of several loaded equipment racks is not an issue in a modern building but it could be more than an older building can handle; consider consulting with an engineer or architect if you have concerns about the weight.

CONSOLE YOURSELF

Most rack manufacturers have small modules that can be built, Tinkertoy-like, into control room consoles and as editing workstations. These have small vertical racks that form the base of the console and upper rack modules that are either sloped or vertical. A countertop desk is usually mounted at the point where the upper and lower rack modules join, forming a nifty console.

Such consoles can be built to nearly any length and there are myriad options for overall height, shape, color, structure and countertop surface. Some rack manufacturers even have rack modules that are intended to be installed at the top of a tall console, with faces that angle down to improve visibility and access for the operators.

Your choices for such built-up consoles are nearly limitless, including dozens of variants for the countertop alone. Most rack manufacturers will be happy to discuss your needs to come up with a practical design.

If there is something really unusual that you need in a console, or if you require a custom cabinet-grade look, there are several builders of custom consoles. System integrators almost always know a cabinetmaker that can build a custom console; in fact, system integrators have been known to have their own cabinet shops for this purpose.

With a custom console, your imagination and funding are the only limits regarding the design and appearance of your console. If you get to the custom-console stage, you should know exactly what equipment will be installed in your console, where it will be installed and how it will be used. Once a custom console is delivered, it's no fun learning that a necessary piece of equipment will not fit where it is needed.

Whether your console is made in a cabinet shop or built from available modules, consider the counter height and edge details carefully. A counter that's too high or low has a sharp edge that digs into arms, or supports that bang too easily into knees can make an otherwise heavenly console hellish.

Two last tips about consoles: First, consider making a mock-up out of cardboard to make sure everything fits where you need it. Second, ask the people who will use the console for their advice; even if they have no new insights for you, they will appreciate being asked and will gripe much less about the console once it is in service.

There are many other topics for discussion on the subject of racks, including the best ways to install equipment, cable management and power distribution, as well as isolating devices and signals that may interfere with other signals. However, before you get to that point, you have to make sure you have racks that are most appropriate for your project.

When you rack up your gear, be sure to leave some space between the components, both for future equipment needs as well as heat dissipation. This means that 40 RU of equipment will almost always require two racks; stuffing that much gear into a single 44 RU rack will lead to equipment failures from heat, unless it's a rack full of passive devices such as patch panels.

It's hard to get excited about equipment racks when there are much more sexy devices in a television system. However, an equipment rack is the backbone of any successful system, providing the physical structure and organization necessary for convenient, long-term use. ■

Bob Kovacs is a consultant, writer and broadcast engineer. He can be reached at pvreditor@yahoo.com.

AUDIO MIXER

Studio Technologies 742 Audio Mixer

by Stephen Murphy

Skokie, Ill.-based Studio Technologies recently introduced two single-rack unit audio mixers specifically designed for use in ENG vehicles: the single-bus model 740 ($995) and a dual-bus model called the 742 ($1,095).

Despite their deceptively simple user interfaces, both mixers feature a healthy set of ENG or general broadcast features.

Studio Technologies Model 742 Audio Mixer is designed for quick setup and simple front-panel operation.

FEATURES

The Model 742, reviewed here, is designed for quick setup and simple front-panel operation; a set of internal jumpers can further customize its operations. The unit is designed for balanced +4 dBu systems.

The mixer features eight mono inputs, the first four of which are mic/line-selectable and the remaining four are line-level only. Individual inputs can be assigned to either or both of its two mono output busses.

All the 742's external controls are located on the front panel and all input/output connections are on the back.

On the front panel, each of the eight input sections features a gain knob, output bus assignment toggle switch (1, 1+2, 2) and a dual-color LED signal-present/peak-level indicator. Channels 1 through 4 are mic- or line-level selectable by pushbutton.

The four mic/line inputs provide a line-level gain range of –32 to +28 dBu, and a mic-level gain range of –76 to –8 dBu; the line-level only inputs range from –14 to +28 dBu. The status LED lights green when a signal is at least 18 dB below the nominal internal operating level, and the LED lights red when the input signal is within 6 dB of the input circuitry's maximum level. A global 12 V phantom power circuit can be activated for the four mic inputs using an internal jumper.

The front-panel output section features dual-channel concentric knobs for setting master and monitor output levels. Dual 10-segment LED meters display the levels at the main outputs.

The 742 features a studio-grade two-channel output compressor circuit. Though the compressor has no external controls, it can be internally configured to engage when the main outputs reach +10 dBu (factory default) or +6 dBu, or it can be bypassed; two yellow LEDs on the front panel indicate when the compression circuit is active.

The 742 also has a built-in tone generator for level calibration. A front-panel switch sends the tone generator to the main output busses. In addition, Studio Technologies provides a dedicated tone output on the rear panel that is always active. The tone generator produces +4 dBu sine wave at 400 Hz or 1 kHz (jumper-selectable).

On the back panel are eight female XLRs for signal input, two male XLRs for main outputs, two 1/4-inch TRS jacks for monitor outputs, a 1/4-inch TRS tone output and a stereo headphone jack.

STUDIO TECH, PAGE 42

FAST FACTS

Application
Field audio mixing

Key Features
Four mic/line XLR inputs, four line-only XLR inputs; studio-quality compressor; 10-segment LED meters.

Price
$1,095

Contact
Studio Technologies, Inc.
847-676-9177
www.studiotechnologies.com

FIELD MIXER

Kamesan KS-342 Mixer

by Tom Vernon

Ever since Shure Bros. introduced the classic M-67 in the early 1970s, the challenge for designers of field production mixers has been to build smaller boxes with more functionality without sacrificing ruggedness and reliability. Kamesan continues this tradition with its KS-342 four-channel field mixer, a device with a lot of features packed in a small footprint.

Kamesan is a relative newcomer to the American broadcast market, but the company's products have been available in Japan for more than 30 years. The fact that Kamesan commands more than 90 percent of the Japanese ENG/EFP mixer market suggests it must be doing something right. Tascam is now the exclusive distributor for Kamesan in the United States.

FEATURES

On the left side of the KS-342 are the inputs: four XLR mic/line connectors, a 5-pin XLR plug for X-Y or M-S (Middle-Side) mics for Channels 1 and 2, as well as a 5-pin mini DIN connector for an assignable auxiliary input. There also are jacks for DC power in and 12 V output.

The right side contains the outputs: XLR left and right line/mic out. There also is an unbalanced 3.5 mm stereo output. An XLR-5 connector provides the main output busses and balanced sub-outputs. The AES/EBU output is switch-selectable between 44.1, 48 and 96 kHz.

There also are controls for the KS-342 compressor. The triggering of the compressor can be selected between the left or right bus, either bus or both. The triggering level can be selected between + 3, + 6, + 9 or + 12 dB.

Each of the four channels can be individually set via a front-panel switch for a mic with 48 V phantom power, dynamic mic, A-B power mic and line-level input. For M-S operation, Channels 1and 2 have a matrix option, where Fader 2 controls the level and Fader 1 controls the width.

Each channel also features a low-cut filter that is continuously variable from 20 Hz to 200 Hz, along with a variable gain control and an assign switch for left, right or center channels. Momentary PFL is available for each channel by pressing in the low-cut filter control.

The mixer's front panel also contains a pair of meters, VU, BBC scale and Nordic scale are available. The headphone amp is switch-selectable between L, R, AUX, stereo and mono. Master gain controls, battery check, built-in oscillator and meter lights are included. A slate microphone allows comments to be added to the main mix.

Having all these controls on the front could result in clutter and confusion, but Kamesan has used clever ergonomic design to simplify operation. The primary mixer and headphone control knobs are conventional, the rest of the set-up controls are flush-mounted, or nearly so, making them readily available, while rendering accidental adjustments unlikely.

Power for the KS-342 can come from an external 10-15 V supply, or from the internal battery pack. Eight AA batteries are required, and a NiCad pack is available as an option. Batteries fit into a special holder that can be quickly swapped in the field.

Be sure to avoid placing this holder upside-down. The contacts are positioned so this won't cause any damage, but it could lead to some anxious moments if the pack is changed in the dark, or by inexperienced users. A better scheme might be to have a holder that only fits in the mixer when inserted properly.

Kamesan KS-342

For those occasions when four channels isn't enough, Kamesan makes the companion KS-6001 submixer, whose four channels are functionally identical to those on the KS-342, except for the M-S matrix.

The KS-6002 two-band EQ and compressor unit is available as an option. Both accessory units latch on to the top of the KS-342. Power and audio connections to/from the mixer are via a multipin connector that pops out of the top or bottom of the units, eliminating the hassle of additional batteries and adapter cables.

As we have come to expect from Japanese manufacturers, the mechanical engineering, paint finish and overall quality of construction for this mixer are superb. Switches and pots have a positive feel, and the rubberized knobs provide a solid grip. Removing the top and bottom covers of the KS-342 reveals two surface-mount, double-sided PC boards.

Quality of construction on the inside is as durable as on the outside. Although the KS-342 doesn't have much of a track record in the United States, it looks like it could stand up to the punishment and abuse to which most remote gear is subjected.

The bad news about circuit boards with surface-mount components is the unit cannot be easily repaired in the field. No schematic is included with the unit, so it must be returned to the factory if calamity ensues.

Included with the mixer is a protective vinyl cover. It comes in two pieces, with Velcro fasteners and drawstrings. It is made of lightweight material, which is unlikely to hold up for long. Users of the KS-342 will probably want to purchase the optional and more rugged KS-342CC case, which can bulk up to accommodate the KS-6001 and 6002 expansion units.

The 22-page operating manual includes specifications, a block diagram of the mixer and illustrations of controls and connectors. All applications and functions of the KS-342 are well-explained. The manual appears to have been written by a native speaker of English, as it is not in the difficult "Japanenglish" jargon that accompanies much imported gear.

A quick bench check confirmed that the KS-342 met or exceeded its frequency response, noise and distortion specs. Field tests confirmed the ease of use for a simple field mix, although most of the advanced features were not needed.

SUMMARY

Kamesan's KS-342 provides a lot of horsepower—more than might be needed for a typical remote broadcast. Stations that do live recording of music, however, may be able to make good use of this mixer's advanced features and benefit from its durable construction.

Pricewise, the Kamesan mixer is a high-end device; it would be definite overkill to use this unit for local sports remotes or covering a grand opening at the mall. ■

Tom Vernon is a multimedia consultant in Philadelphia. He can be contacted by e-mail at TLVernon@blazenet.net

FAST FACTS

Application
Audio field mixing

Key Features
Four-channel mixing in a durable, compact box; Optional KS-6001 submixer and KS-6002 two-band EQ and compressor unit attaches to KS-342.

Price
$3,850

Contact
Tascam (U.S. Distributor)
323-726-0303
www.tascam.com

Canon

CONTINUED FROM PAGE 35

seesaw that can be used for iris control in place of zooming. These buttons can be mapped by entering the information display screen and toggling to the proper button and assigning the desired function. This seems somewhat complex at first, but becomes easier each time you do it.

One interesting parameter is the iris torque setting letting the user select high or low torque for manual iris control. Another clever idea is the f-hold function. Zoom lenses typically exhibit a drop or decrease in f number or aperture size as the zoom range nears the telephoto end. The f-hold function limits the zoom operation to the area within which the drop in f- or light gathering does not occur.

As many as nine users can have their own settings, and those users can be identified alphanumerically. In a shop where there is mutual agreement to the allocation of selected settings for lens use, those settings can be copied from the so-called master lens to any number of other lenses using a Canon accessory cable. In this article I have mentioned only several of the many features available to the photographer. The range of settings is remarkable and should prove to be a great resource for both ENG and video production work.

The lens is, as you would expect, light, tight and fast. Its weight, at just over 3 pounds, is typical of most recent computer-designed lenses. From the smooth tight internal focus ring to the infinitely variable zoom features, to the iris with its user-selectable torque on manual, this is a state-of-the-art instrument. I am constantly amazed at the low light sharpness of today's lenses even on doubler and this lens is no exception. Night scenes, which can reveal deficiencies in any lens since you are generally shooting wide open, were as sharp as at f-11 throughout the focal length range.

SUMMARY

This lens, with its range of custom settings, will excite any news or production photographer. Canon has made what could have been a tedious menu-driven process into a relatively easy procedure to tailor the settings to suit the most demanding user. I found as I explored the possibilities, mapping features and settings to my own needs, that the lens opened up a host of creative areas that I had never considered before and that's saying a lot about a tool that we sometimes take for granted. ■

Frank McDermott is a news videographer with WUSA in Washington. He can be reached at fmcdermott@erols.com.

FINISHING SOFTWARE

Magic Bullet Suite V2 Software

by Michael Hanish

Just the name "Magic Bullet" suggests quite an image: the mystical cure—the hidden secret that will explain or transform everything. What the Magic Bullet Suite Version 2 software does is quite concrete and practical. This newly updated software suite provides a complete, all-digital finishing pipeline to take video footage to a film print.

The suite of 16-bit plug-ins works inside After Effects 6.0 or later (Macintosh or Windows) and has six components. The main plug-in, Magic Bullet, converts video sources to 24p, de-artifacts and de-interlaces. You can do all or just one of these processes with the Bullet, depending on the nature of your project and footage and the output intentions. For example, you would use all three processes if you were originating in video and planning to output to film. You could also use the de-artifact controls on virtually any footage to compensate for the artifacts introduced by color-space downsampling.

FEATURES

The Look Suite is considered the creative area of the whole suite. It is the place where you can assign or create a film look to the footage, after performing color correction. Look Suite's effects are built from four categories of controls: Subject (preps the image for processing by providing saturation and gamma adjustments), Lens Filters (emulations of white-and-black diffusion, pro-mist, and grad filters), Camera (film stock and emulsions types) and Post (many of the same controls found under Subject, with the addition of warm/cool and warm/cool hue sliders).

The presets, accessed through a very handy preview browser, range from color bypass and sepia to warm/fuzzy and cool diffusion. Naturally, these can all be customized, saved and reused.

The Opticals plug-in creates filmlike cross-dissolves, fades to black then burns to white. The operative concept here is "film/like," meaning that with a fade-in, for example, the brightest areas pop into view slightly before the darkest ones, mimicking the results of the optical printing process rather than the mathematical calculations of a digital fade-in.

The Letterboxer plug-in provides a means to crop the final output to any aspect ratio desired, from 4:3 to 16:9 and 2.35:1 and beyond. Naturally, custom aspect ratios are supported. The color attribute lets you set the color of the letterbox or pillarbox bars; the line where the image and the bars meet is very sharp, not anti-aliased. The nice touch with this plug-in is that it is pixel-aspect aware, and it automatically adjusts to the pixel aspect of your comp.

Broadcast Spec provides the means to conform the project to NTSC broadcast specifications, with settings for DV-originated projects, as well as for uncompressed standard-definition output devices like CineWave or Igniter.

The final plug-in of the group, Misfire (new to this version), has controls for recreating all sorts of defects and other film characteristics, like grain, scratches, splotches, flicker, fading, dust, as well as several kinds of damage, such as the effects of film being run through a dirty projector or gate damage.

IN USE

Using the Magic Bullet Suite can be—but doesn't have to be—a tweaker's delight. If you like experimentation, tweaking and testing parameters to get a look that's absolutely unique, appropriate and world class, then this package will keep you happy for hours and days. To the other extreme, there are plenty of presets and excellent starting points; with a few moments of application, you are up and running. The included presets cover most situations and projects, and the manual is excellent in its advice, examples and explanations.

I used the Bullet on several bits of video

The Look Suite allows users to assign or create a film look to the footage, after performing color correction.

destined for a historical documentary. I wanted the shots to suggest a past time, and so I wanted them to look significantly different than the rest of the video. I found myself wanting to stay far away from the cliché-ed historical black-and-white look, and a browse through the preset looks gave me a few ideas to try out.

This new version of the Bullet has dramatically improved rendering speeds. I followed the suggestions in the manual to render at draft resolution while trying parameter combinations, and thanks to the speed and the 16-bit rendering (which makes the downsampled 10-bit video look even better and more accurate), it was easy to try a number of looks in a reasonable amount of time.

Not every step in the Bullet process is immediately intuitive, especially to those of us who have not had much experience with film stocks. But, by working through the sample project and following the guidance of the manual, more than enough is revealed to make me feel like I know what I'm doing.

There are several other notable improvements in this version. First, dongle copy protection has been eliminated in favor of a straight serial number. Second, this update merges SD and HD versions into one. Previous owners of the HD version receive a faceless render node license for Magic Bullet (MSRP $495) that allows unlimited machines to do networked rendering of projects.

Also recently released and worth consideration, depending on your needs, is Magic Bullet Editors (MSRP $299), a plug-in version that works inside Adobe Premiere Pro, Avid Express Pro, Final Cut Pro and Sony Vegas; it provides the Look Suite and Misfire capabilities of the full package as well as the 55 Look Suite presets. Demos of both versions are available at the Red Giant Web site.

FAST FACTS

Application
DV finishing

Key Features
Gives film-look to video, including de-artifacting and de-interlacing, effects

Price
$795
$149 for upgrade from Version 1

Contact
Red Giant Software
260-625-5343
www.redgiantsoftware.com

SUMMARY

The Magic Bullet Suite is a fantastic piece of software that provides very high quality output: fast rendering, superior anti-aliasing and de-artifacting, as well as a variety of well-designed tools and presets to meet just about any situation. It can be of great benefit to the look of just about any project, not only pieces that are bound for film output. Whether the software is justified for your situation is up to you, but take a look at it. It won't be a waste of time. ■

Michael Hanish runs Free Lunch, a video/audio/multimedia production house a few miles outside scenic Guilford, Vt. Contact him at mhanish@sover.net.

Studio Tech

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IN USE

The Studio Technologies Model 742 is principally designed for ENG truck use. In this application, the 742's streamlined set of controls and rock-solid build quality are just what the chief engineer ordered. In addition to the front-panel controls, Studio Technologies endowed the 742 with a useful range of critical calibration controls and global operational settings, and wisely put them inside the box.

In most studio applications, having those controls locked away might prove frustrating. In the fast-paced, turn-it-up-and-go world of newsgathering, however, the unit will already be set up and calibrated for the truck's normal operations. The end user is presented only with a near-infallible set of controls; in a pinch, anyone should be able to operate this device. The 742 suits this purpose perfectly, and provides an impressively clean signal path to boot.

The thing I liked best about the 742 compared to other single-space mixers I have used is that it achieves a dual-bus configuration in a useful and thoughtful manner.

Though it could be used for stereo applications, the 742 is really built as a dual-mono bus mixer. Since most ENG trucks are working with mono signals, Studio Technologies installed toggle switches (as opposed to panpots) to assign channels to the output busses. This allows the engineer to create two independent feeds without worrying about unwanted leakage due to improperly set or uncalibrated panpots.

If not used for sending two feeds, the second bus can also be used to monitor external audio sources within the truck, completely independent of the broadcast feed. Alternately, if the second bus is not being used at all, flipping an input channel's toggle switch to the dead bus acts like a channel mute switch.

I want to compliment Studio Technologies on the physical build and circuit component quality of the 742. Looking inside the unit reveals a number of high-end design elements (including sealed relays for the mic/line switch and the same compressor VCA as used by dbx and others), a high-quality toroidal power transformer and clearly labeled jumpers and trimpots. Likewise, the operational manual is well-written and technically comprehensive.

During my testing of the 742, I did find some problem areas and a few items for my wish list.

The biggest problem I had was with the concentric output knobs. I found that adjusting the center pot (Channel 1) would occasionally move the outside pot (Channel 2) as well. Depending upon where the initial levels were set, I could get a change of 3 dB or more on the outside knob when quickly fading up or down the inside knob; this occurred on both the main and monitor output knobs. The obvious workaround is to hold the outside knob while turning the inside knob.

I want to compliment Studio Technologies on the physical build and circuit component quality of the 742.

The other problem I had with the 742 is that it has no LED indicating the unit is powered up. This could give the uninitiated operator a minor heart attack and/or send troubleshooting in the wrong direction if audio problems arise.

Also on my wish list would be center detents at unity gain for the main and monitor output knobs, or even fully detented knobs across the range (which may also prevent the earlier slippage problem). A front-panel headphone jack would also be nice, but it is clear there just isn't room to spare.

In talking with Gordon Kapes at Studio Technologies, he informed me that the company has addressed my concerns by modifying the design of the dual rotary level control (potentiometer) to minimize the chance that the two sections could mechanically rub together. Also revised was the circuitry associated with one of the front-panel LEDs to provide a power present indication and a mechanical detent was added to assist users in quickly setting the default levels. Due to long lead times for custom parts, these changes will become part of production Model 742 units over the next several months, Gordon said.

SUMMARY

Studio Technologies designed the 742 for ENG vehicle use, with all essential controls at your fingertips; critical controls that may impede its quick and foolproof operation are relegated to the inside of the unit. From its dual-mono bus architecture to its high-quality output compressor section, the rock-solid, single-rack 742 provides a great deal of flexibility and an impressively clean output signal. ■

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

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MARKETPLACE

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JVC HD Monitor

The DLA-HRM1 is a 48-inch HD reference monitor by JVC that uses its 3-chip direct drive image light amplifier (D-ILA) technology.

The monitor offers 1920 x 1080 pixels that deliver HD image quality.

Other features include superior digital processing, and a color contrast ratio of 3000:1. Users can move the monitor upright or have it inverted to suit their standing height or seated position at a workstation.

The anti-reflective, anti-glare screen gives viewers excellent imaging performance.

Additionally, the monitor has an optional brightness a adjust option. It accepts a variety of computer signals land digital video inputs including Dual link HD-SDI, HD-SDI, SDI, DVI and HDMI and analog inputs that include a selection of computer resolutions, component, S-video and composite.

For more information, contact JVC at 800-582-5825 or visit *www.jvc.com/pro*.

Vertical Rack Cabinets

The Winsted Pro Series II vertical rack cabinets are designed to simplify the way engineers build a rack.

The Pro Series II series features adjustable tapped front and rear rack rails. New gusseted horizontal supports have been added for more strength.

Accessories include a vented top panel with mounting bracket for a cooling fan and for additional security, Winsted has added a set of four locking side. To keep electronics cool, a 10-inch fan was added that includes a 5-foot power cord, two finger guards and a 10.5-inch blank panel for mounting in the top of the rack. Also, to keep the vertical racks free from clutter, new 7-inch wiring spaces were added.

Both front and rear doors are removable for easier access to cables.

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

Signal Converter

The Analog Way Ultra VIO accepts and performs cross conversion of all computer and video signals, analog or digital.

Ultra VIO features three universal inputs that accept all existing formats, analog or digital, from computer to video to HD. The inputs allow any type of interfacing connectors with loop through, including SDI and HD-SDI. Connectors available include BNC, HD15, DVI, mini DIN and cinch/RCA.

Additionally, the Ultra VIO features genlock on SD and HD input to have a genlocked SD or HD output.

Operators have direct access to input selection, image freeze, auto centering, image processing and an intuitive LCD menu for easy set up.

The 8.4-pound Ultra VIO is supplied with a DVI-I/HD15 adaptor, HD15/HD15 cable, 5BNC/5BNC cable and more.

For more information, contact Analog Way at 212-269-1902 or visit www.analogway.com.

Portable Analyzer

The LV7700 rasterising digital signal analyzer conforms to 17 HD and SD standards and includes all the features of the LV5750 portable video monitor in a compact unit. Waveform, vector, picture, audio and status/protocol screens can be selected individually or as four-in-one simultaneous displays.

The analyzer can convert Y/Cb/Cr to Y/R/G/B or NTSC display to help in gamut monitoring and to assist in color correction. The LV7700 incorporates Leader's cable-length feature that warns against deterioration of the digital pulse waveform as cable feeds approach "cliff-edge."

The LV7700 can simultaneously monitor and display up to eight channels.

For more information, contact Leader at 714-527-9300 or visit *www.leaderusa.com*.

Portable Standards Converter

The Proteus portable standards converter features 10-bit SDI, analog composite and audio I/O, and advanced standards conversion algorithm for PAL to NTSC and vice versa, audio synchronization facilities and a full set of signal processing controls.

Additionally the unit has full audio delay synch optional for AES, analog and embedded, video and audio processing controls, format converter, synchronizer, TBC and audio mux/demuxer and comes in a field portable/desktop unit or rack mount version.

For more information, contact Brick House Video at 212-967-1774 or visit *www.brickhousevideo.com*.

Carrying Case

The Stowaway 20-20 W is an ATA 300 style stackable shippable case that mates with all carry-on Porter Cases with a cart. Male channels on the bottom of the Stowaway fit into those in the lid of the Porter Case. Female channels on the Stowaway lid make room for other Stowaway cases to stack and nest on top.

The 17-pound case is 12.5-inches deep and is made of polyethylene plastic, with an aluminum valance, lid stays, and comes as cloth lined, with layered foam or an adjustable divider system.

The Stowaway 20-20 W has many uses—for a computer and accessories, photography gear or as a samples sales case.

For more information, contact Porter Case at 800-356-8348 or visit *www.portercase.com*.

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Marketplace Editor, P.O. Box 1214,
Falls Church, VA 22041, USA

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ANTENNAS/ TOWERS/CABLES

AUDIO PRODUCTION

Want to Sell

JVC DS-DT900 audio DAT w/parallel & serial cntrl, $400; Sony ECM77B lapel mic w/clips, in case, gd cond, $155/BO; Electrovoice PL20, has been redesigned at the factory, now has specs of an RE-20, $350. E Stevens, 610-328-3347 or esvp3@comcast.net.

Mackie 1604 VLZ Pro, new, too low to quote; Mackie 1604 VLZ, used, $625; Bittree & ADC audio & video patch panels from $300; Stantron 45RU racks from $300; Emcor Series 10 40RU racks from $300; Digidesign 888, $650; Sony PCM7040 DAT, $2990; Crown D75 & D150 amps, low $$; DPS stereo audio sync, $1000; Panasonic SV-3800 DAT, $500; Genelec 1029a studio monitor, pair, $750; Genelec 1030a studio monitor, pair, $1150; HHB Circle 5A studio monitors, pair, $950; Wohler Amp 1-A, $475; Neumann U87 Ai studio mic, $1995; AKG C 414 B ULS mic, $1450. 818-788-4700 or www.tvprogear.com.

CAMERAS

Want to Sell

JVC Paintbox camera cntrl for KY-27 w/15' cord, cntrls Luminence, color and pedestal, xlnt cond, $290/BO; Cavision wide angle lens adaptor, fits 82mm lens opening, like new, $999. E Stevens, 610-328-3347 or esvp3@comcast.net.

Panasonic AJ-HDC20a hi-def DVCPRO w/lens, $38500; Panasonic AG-DVC200 w/19x Fujinon lens, $5495; 3 Sony DXC-D30 studio config, $8500/ea; Sony DSR-300a camcorder pkg, $5995. 818-788-4700 or www.tvprogear.com.

Sony DSR-PF150, xlnt cond w/all standard accessories, $2250; wide & tele aux lens avail, also Century Optics Anamorphic; will trade for or into loaded Mac laptop/desktop dual G5. Bruce, 406-542-2595 or bbbacres@bresnan.net.

CAMERA ACCESSORIES

Want to Sell

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

CAMERA ACCESSORIES (Cont.)

CSR/Daiwa tripod w/TD35 titanium legs, ENG 30, hi-end head, beautiful fluid motion for hi-end work, new cond, $4000 or will trade for or into loaded Mac laptop/desktop dual G5. Bruce, 406-542-2595 or bbbacres@bresnan.net.

EDITING EQUIPMENT

Want to Sell

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

Matrox Digisuite LE editing board w/2 sets of breakout cables, like new, $999. E Stevens, 610-328-3347 or esvp3@comcast.net.

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LIGHTING

Want to Sell

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MICROWAVE/STL

Want to Sell

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MISCELLANEOUS

Want to Sell

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MONITORS

Want to Sell

JVC VMR-190SU 19" program monitor CP, BS, YC, component, xlnt pic, $400/BO; Sony 411 quad B&W 5" monitors, 19" rack, vgc, $475. E Stevens, 610-328-3347 or esvp3@comcast.net.

Sony 2030 cube monitor, xlnt cond, 4 avail, $300/ea. 631-236-7121.

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

SIGNAL PROCESSING

Want to Sell

PESA DA3000 w/dual PS & 10 SDI DAs, $1500; Leitch FR-684 dual PS 2RU Frame, $295; Leitch FR-884 dual PS 2RU frame, $295; Leitch Mix-7001 multi-function digital frame, $400; Grass Valley Series 8900 Frames w/dual power supply, $600; GVG 8501 video DA's, $100; GVG 8551 audio DA's, $100; Sony BVX-D10/BVR-11, $3990. 818-788-4700 or www.tvprogear.com.

SWITCHERS

Want to Sell

Echolab Prima MSV6 10-input switcher w/chroma key, $12500; Grass Valley 200-2, fully loaded, $6000; Miranda Digipath 16x16 SDI router w/remote panel, $3500; Sierra Video 16x16 composite video router, $1500; Leitch 4x4 MB routers, $175; GVG Ten X, $600; Kramer 5x4 A/V switchers, new, $475. 818-788-4700 or www.tvprogear.com.

TELEPROMPTERS

TEST EQUIPMENT

Want to Sell

Leader LV-5700 SDI waveform/Vector, $10000;Leader LV-5100D SDI waveform/vector, $3995; Videotek TVM-821D SDI waveform/vector, $3995; Tektronix WFM601M SDI waveform, $5500; Tektronix WFM601A SDI waveform, $4500; Tektronix WFM601 SDI waveform, $3990; Tektronix 1731D PAL SDI vectorscope, $2000; Tektronix 764 digital audio monitor, $2000; Tektronix 760A audio monitor, $1000. 818-788-4700 or www.tvprogear.com.

TEST & MEASUREMENT

Tektronix 1420 vectorscope w/warr, $450; Tektronix 528 waveform monitor w/warr, $400, buy both & I will incl twin rack, xInt CRTs. E Stevens, 610-328-3347 or esvp3@comcast.net.

Tektronix 1750 waveform/vectorscope in carry enclosure, bright & clear, pristine, like new, $1200/BO. 631-236-7121.

TRANSMITTERS/ EXCITERS

Want to Sell

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

TRUCKS

Want to Sell

53' Double Expando, 11 Ike HK-377's, Philips 62-input DD35 digital switcher, DVEous Dual Twin, 4-channel EVS, Infinit, 9 BetaSP with slo-mo, RTS ADAM, 48-channel Midas 2000 audio board, much more including "B" unit; **50' MediCoach Expando** with 4 Ike HK-366 and 4 HK-355's, GVG3000 64-input switcher, DVEous Dual Twin, 6-channel EVS, Infinit, 5 BetaSP with slo-mo, RTS ADAM, Yamaha PM4000, much more. See these trucks and others at www.broadcastassociates.com or call J A Taylor & Associates, 610-754-6800 x.7.

This great CA trailer with tractor must be sold soon. The owner has stopped taking bookings. This trailer is in excellent condition. **48' Gerling trailer** with 8 Ike HK-366's, Sony DVS-7350, DVEous Dual Twin, Infinit, Pesa Router, 4 BetaSP with slo-mo, RTS intercom/IFB, Soundcraft Vienna II audio board, complete and ready to work. See this truck and others at www.broadcastassociates.com or call J A Taylor & Associates, 610-754-6800 x.7.

TV FILM EQUIPMENT

Want to Sell

Bosh FDL60 telecine film to video transfer, completely refurbished & rebuilt w/6 mth warr on parts, incl 16 & 35mm gates, primary color corrector, masking cntrl for negative setup, programmable speeds (SAS), 16mm mag & optical sound, 35mm optical sound, call for price. E Stevens, 610-328-3347 or esvp3@comcast.net.

VIDEO TAPE TRANSFER

VTRs/VCRs/ RECORDING MEDIA

Want to Sell

JVC BR-7000UR Hi-Fi duplicators (30), just removed from service + DA, $60/unit + shpg or $1200 for all + shpg. H Ellenbogen, 845-331-5849.

Sony BVH-2000 1" VTR w/TBC, new 96-min tape, V1-K & empty reel, manuals, calibrated & working fine, $400. Ted, 847-441-5999.

Sony UVW1200, lw hrs, xlnt Betacam plyr, $2000; Sony DSR-40 DVCAM full-featured deck w/componet out for Betacam dubs, RS422, firewire, large/small tapes, xlnt cond, $2500; DSR-30, xlnt cond, full-featured DVCAM VCR, can make letterbox of your widescreen footage, $2000; (2) Sony S-VHS edit decks, SLV-1000 & SLV R5U, both xlnt cond; cash or will trade for or into Mac dual G5 or hi-end Mac laptop. Bruce, 406-542-2595 or bbbacres@bresnan.net.

Sony UVW-1800, lw hrs $5000; Sony PVW-2800, from $3500; Sony BVW-70 from $3500; Sony BVW-60,from $1500; Sony DSR-1500A, new, $5150; Sony DSR-45, new, $3995; Panasonic AJ-D950 DVCPRO 50 rcdr, from $6950; Panasonic AJ-D850 DVCPRO 50 rcdr, $3950; Panasonic AJ-D750 DVCPRO 50 rcdr from $3950; Panasonic AJ-D230H DVCPRO rcdr from $1695. 818-788-4700 or www.tvprogear.com.

Sony UVW-1800, 170 hrs on head w/RS-232 interface & time code, really pristine, $4500; Sony BVH-2000 internal TBC, time code card, RS-232 card, sides & handles, from private suite, lw hrs, pristine cond, $2000. 631-236-7121.

EMPLOYMENT

VIDEO SERVICE TECHNICIAN

Industry-leading dealer for professional video equipment is looking for a top-notch person experienced in all aspects of repair and maintenance of VCRs, cameras, monitors, etc. Experience in system design, installation and CAD would be a plus. Organization, attention to detail, good phone manner, the ability to communicate with co-workers as well as customers is a must.

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Please forward resume and introduction letter to:
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jweinstein@greatnorthernvideo.com
GREAT NORTHERN VIDEO
702 Riverwood Drive, Pembroke, NH 03275
www.greatnorthernvideo.com

Belo Capital Bureau is looking for a Broadcast & IT Engineer to be based in Washington, D.C. Responsible for technical operation and IT support for broadcast and newspaper journalists. Go to www.belo.com for more information on position requirements. Resume and references to: Craig Harper, Director of Engineering, 400 South Record St. Dallas, TX 75202.

KNTV, the NBC O&O station located in San Jose, CA and serving the entire Bay Area, is looking for a Director, Technology and Broadcast Engineering, responsible for all broadcast and information technology and directly related aspects of NBC11's operations. Primary objective: to produce the highest possible quality broadcast and informational services to the station, its viewers, clients and partners. Lead the development and implementation of the station's technology strategies. Responsibilities include preparation of NBC11's capital plan; the coordination of the facility, production, engineering, and technology needs of the station. Facilitate training and cross training of IT and engineering employees in the operation, care and maintenance of technological equipment employed in NBC11's businesses and partnerships; the review, mentoring and development of the performance of engineering and IT personnel; leadership of station EHS efforts and projects, responsibility for preparing and maintaining department budgets, forecasts, plans and reports; projecting NBC11's capital and technical needs and monitoring expenditures of capital projects and other capital spending, and of purchasing equipment. We're seeking an individual with expert experience in broadcast television and field of digital television and information technology to include transmission, production and distribution technology. Demonstrated skills in project management, broadcast pro-duction, engineering, finance and positive employee relations. Excellent leadership, team building, communication and general management skills. BS in Engineering or equivalent experience. To apply, visit www.GECareers.com and search under job number 421933. KNTV is an EOE.

KNXT Channel 49 General Manager: KNXT, the only Catholic non-profit television station in California, with coverage from Merced to Bakersfield, has a rare opportunity for an experienced broadcast industry manager. We are seeking someone who will build upon the success of a non-profit Christian station celebrating its 18th anniversary in broadcasting. The General manager position is hands on involved in the day to day activity of the station as well as planning and partnering with local state and national industry leaders to deliver high quality Catholic Christian broadcasting to the central valley of California. The ideal candidate we are seeking has a minimum four years proven broadcast management experience, preferably within the television industry, knowledge of federal and state laws and regulations, and be familiar with and knowledgeable of the values and teachings of the Catholic Church. Experience within a non-profit setting is preferred. If you are interested and inspired to join this highly energized Christian ministry send your resume to: Human Resources, Diocese of Fresno, 1550 N. Fresno St., Fresno, CA 93703. Fax: 559-488-7461 or : humanresources@dioceseoffresno.org EOE.

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Business News

Acquisitions Improve Q4 for Leitch

TORONTO

Leitch Technology is finally reaping the financial benefits of its Videotek and Inscriber acquisitions over the past year.

Revenue for the company's fourth fiscal quarter, ending April 30, 2005, was $57.2 million, up from $41.9 million during the same time period last year.

The increase was attributed to the acquisition earlier this year of Ontario-based graphics provider Inscriber and the 2004 purchase of Videotek, a Pennsylvania-based developer of test and measurement technology.

For the year, revenue was $217.9 million, up from $154.6 million during the prior year. Revenue of $36 million, or 57 percent of the increase, was related to the acquisitions.

"Besides the recent acquisitions, Leitch has been benefiting from its improved sales infrastructure and an improved HD product offering, particularly the NexioHD server platform, which began shipping earlier this year," said Sera Kim, analyst for financial services firms Raymond James.

Tim Thorsteinson, CEO and president of Leitch, called the growth in revenue the largest year over year increase in the company's history, although revenues for the year decreased.

Currency fluctuations, due to the weakening U.S. dollar relative to the Canadian dollar brought revenues down by $7 million, or four percent compared to the previous year.

Avid-Pinnacle Clears DOJ Hurdle

TEWKSBURY, MASS. & MOUNTAIN VIEW, CALIF.

Avid Technology got the go-ahead from an antitrust review board to proceed with its proposed acquisition of Pinnacle Systems.

The Justice Department granted early termination of the 30-day waiting period under the Hart-Scott-Rodino Antitrust Improvements Act.

In a June 20 teleconference, CEO David Krall said he anticipates that Avid will receive clearance frm the European Commission by early August and is now assuming Aug. 1 as the closing date.

Avid CFO Paul Milbury said the company plans to keep 80 to 85 percent of the Pinnacle workforce.

Avid will most likely issue approximately 6.2 million shares and pay $71 million in cash. A shareholder vote will be held July 27, 2005.

Pinnacle will operate at a loss during the transition but Milbury expects Avid to end 2005 with $3 million in cash.

For the quarter ending March 31, 2005, Avid reported sales of $166 million, a 30 percent increase over $127.4 million during the same period one year ago.

Peter Gabriel to Buy SSL

OXFORD, ENGLAND

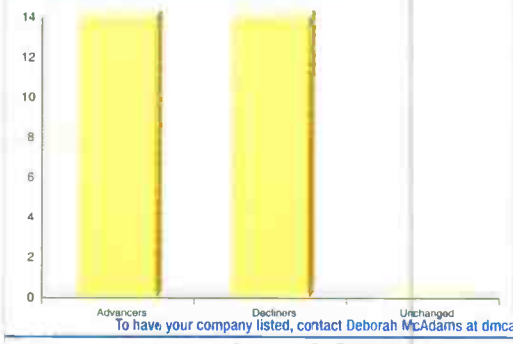
Known for his moody pop music, Peter Gabriel—in a joint venture with broadcast entrepreneur David Engelke—is acquiring the assets of Solid State Logic (SSL).

SSL will continue to design and manufacture mixing consoles and related audio technology.

As co-founder of Syco Systems—developer of the "Tablet" digital audio workstation—Gabriel has blended music with technology. OD2 (On Demand Distribution) an online music distributor, is among his recent projects.

Emmy winner Engelke has been involved with Pinnacle Systems, Montage Group and Digital Editing Services and currently heads up Broadcast Devices, a supplier of electronics for the broadcast industry.

WIN-LOSE RATIO



TOP ADVANCERS BROADCAST STOCKS
(June 3 - June 17)

Entravision + 6.90%
Nexstar + 5.72%

TOP DECLINERS BROADCAST STOCKS
(June 3 - June 17)

Paxson -10.67%
EW Scripps - 3.47%

TOP ADVANCERS TV STOCKS
(June 3 - June 17)

Leitch + 12.86%
Harris + 12.52%

TOP DECLINERS TV STOCKS
(June 3 - June 17)

SeaChange - 6.28%
Ciprico - 5.06%

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

TV Tech STOCKS as of June 17

Company Name	52-Week Range	June 3	June 17	% Change
Avid	40.90 - 68.35	55.88	58.77	5.17%
Belden	17.65 - 24.59	20.87	21	0.62%
Ciprico	3.15 - 4.90	4.35	4.13	-5.06%
Harmonic	4.86 - 12.40	5.73	5.92	3.32%
Harris	21.60 - 35	28.83	32.44	12.52%
Leitch	6.72 - 11.20	9.1	10.27	12.86%
LSI Logic	4.01 - 8.23	7.58	7.9	4.22%
Pinnacle	3.25 - 7.50	5.71	5.96	4.38%
Sci. Atlanta	24.61 - 35.59	34.5	33.8	-2.03%
SeaChange	6.90 - 19.75	7.49	7.02	-6.28%
Tektronix	20.97 - 35.00	22.96	24.55	6.93%

Broadcast STOCKS as of June 17

Company Name	52-Week Range	June 3	June 17	% Change
Acme	3.30 - 7.45	4.01	4.07	1.50%
Belo	18.00 - 28.43	24.67	24.48	-0.77%
Emmis	15.29 - 21.40	18.27	17.75	-2.85%
Entravision	6.85 - 9.11	7.25	7.75	6.90%
Fisher	45.02 - 52.60	50.53	49.23	-2.57%
Gray	10.63 - 15.74	11.56	11.4	-1.38%
Hearst Argyle	22.57 - 26.48	24.78	24.75	-0.12%
Nexstar	4.52 - 11.75	5.59	5.91	5.72%
Lin TV	14.34 - 22.46	14.72	14.49	-1.56%
Paxson	0.48 - 3.81	0.75	0.67	-10.67%
Sinclair	6.12 - 11.05	8.62	8.88	3.02%
Liberty	34.32 - 47.60	35.95	36.51	1.56%
Univision	25.00 - 35.22	27.19	26.85	-1.25%
Young	4.82 - 13.79	5.25	5.28	0.57%
Tribune	35.02 - 47.37	36.12	36.01	-0.30%
Meredith	44.51 - 55.51	49.01	48.93	-0.16%
EW Scripps	44.73 - 54.00	51.27	49.49	-3.47%

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