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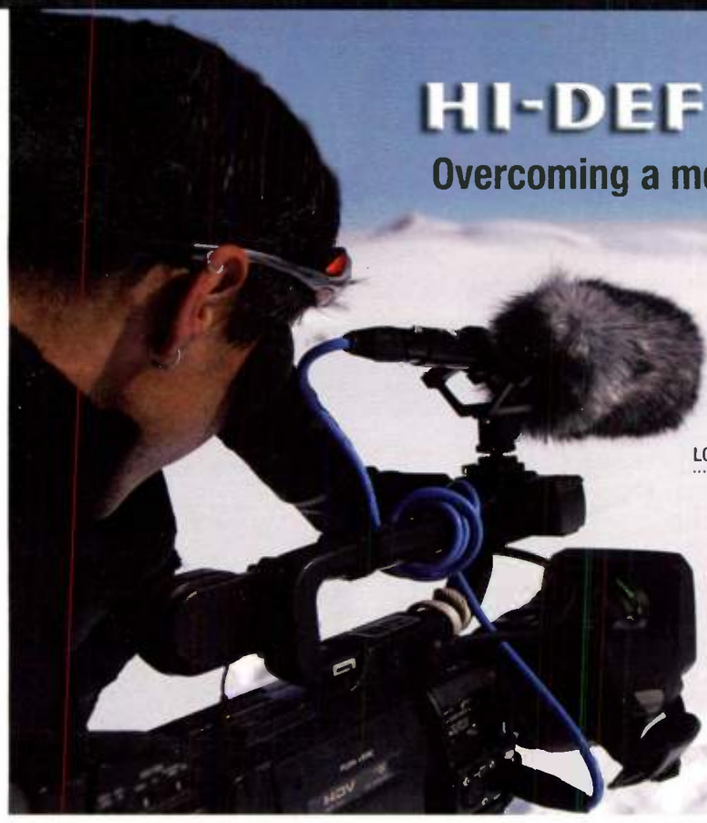

HI-DEF OR BUST

Overcoming a mountain of obstacles to shoot HD

by Mary Ann Melody

LOS ANGELES

The glacial climb is 16,067 feet and only a few hundred miles from the South Pole. It is cold, it is icy and it is windy. No electricity is to be had for miles—or for that matter, hot food and a decent bed.

It took 10 days, hundreds of pounds of gear, four camps—and for some, 40 years in between visits—but a crew of 10 made it to the summit of Mt. Vinson in the Antarctica on Dec. 25, 2006 with an incredible story to tell.

And tell they did, to independent cinematographer Juan Antonio Puyol, who captured Antarctica's immense and stunning landscapes using high-definition production equipment.

"It was important to have something that could do that justice and that was the primary

HI-DEF, PAGE 12

Cable Poised to Unlock Set-tops

Long-delayed integrated security ban set to kick in

by Deborah D. McAdams

WASHINGTON

The venerable cable set-top box is about to break the bonds of industry control and show up on retail shelves... but not all at once.

"I wouldn't call it a flood... we envision them popping up in retail," said Dave Clark, director of product strategy and entertainment products for Scientific Atlanta. "As far as the vast majority, we still see the leased model as very strong."

Since the inception of cable TV, subscribers have leased their set-tops from cable companies at around $4 to $5 a month, but a 10-year-old dictum to make set-tops a retail item is about to take effect.

As of July 1, cable operators can no longer distribute set-top boxes that include the encryption technology that determines which channels are accessible. That security function must reside on a separate device so set-tops can work on any cable system and be sold in retail stores. This so-called "integration ban" was engendered in the 1996 Telecom Act to induce a competitive market for set-top boxes or other cable access devices. It took another six years for the cable and consumer electronics industries to hammer out a game plan known as "plug-and-play." The initiative was based on an SD-like apparatus—a CableCARD—that contained the cable access technology, and could be plugged into any compliant device deemed "digital cable ready." That was December 2002.

THIS IS NOW

Today, there are 8 million such compliant TV sets in the market according to estimates from the Consumer Electronics Assoc-

CABLE, PAGE 34

SONY

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The shoulder-mount HPX500 features four card slots and can record 64 minutes in DVCPRO HD, 128 minutes in DVCPRO50, and 276 minutes in DVCPRO on four 16-gigabyte P2 cards. Its 4:2:2 sampling rate and intra-frame encoding ensure exceptional quality pictures, while its interchangeable lens, 50/60-Hz selectability and low power consumption assure superb flexibility. And best of all, the HPX500 is backed by an industry-leading 5-year warranty*.

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NBC takes iControl

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Will Workman

Inside Broadband

It's only a mere $9 billion. Based on various news reports, that's roughly what advertisers will spend on broadcast TV in the upcoming season this fall, with no increase over the current season.
For years, they've been spending that money knowing... p. 44

Jay Ankeney

Focus on Editing

When Quantel named their awesome new post-production technology "Genetic Engineering" it raised some eyebrows. Then when they claimed it would "rewrite the DNA of post production," some said Quantel had to be kidding.
Well they are not. p. 46

Charles W. Rhodes

Digital Television

There appears to be a great euphoria among broadcasters over telecasting to pedestrians and moving vehicles with the new technologies demonstrated at NAB2007. I wouldn't want to upset this mood, but that development may have been overtaken... p. 48

World Radio History

FROM THE EDITOR

A Showdown Over Indecency

A recent court ruling that struck down the FCC's fines against broadcasters for violating the commission's indecency rules illustrates just how far the commission has gone in imposing its definition of "indecency" on broadcasters.

In a 2-1 vote earlier this month, the Second Court of Appeals ruled in favor of broadcasters when it vacated the FCC's fines against Fox for airing a "fleeting expletive." The court called the commission's policy on such expletives "arbitrary and capricious," and said the commission had failed to justify its change in policy in 2001.

Chairman Martin was not pleased. "If ever there was an appropriate time for Commission action, this was it," the chairman responded after the decision. He also hinted that such decisions would make it more likely that Congress will consider imposing an a la carte rule.

It's been awhile since the commission has exercised any common sense in its policies against indecency—way back in 2003, if you remember. That was when the commission decided not to fine NBC for airing Bono's infamous speech at the 2003 Golden Globes in which he said, "This is really, really f**king brilliant." At the time, the FCC based its decision on the fact that it was a "fleeting and isolated remark."

Five months later, after the infamous Janet Jackson incident at the 2004 Super Bowl, the commission reversed its decision and ruled against NBC. Although no fine was imposed, the stage was set for a showdown between the commission and broadcasters.

In recent years the commission has taken a blanket approach to indecency and has been less likely to take into account the context in which said indecencies have occurred. It's time for the commission to restore some rationale to these policies and this court decision is a good start. Time will tell, however. There's still the Super Bowl incident to contend with.

This decision doesn't mean that broadcasters are any more likely to allow such language on the air, however. But it is one ruling in a series that will continue to define how broadcasters conduct themselves in a competitive media world. Hopefully, with each ensuing court decision, some kind of guiding principle will take form, allowing broadcasters and the government to balance the rights of viewers with the First Amendment rights of broadcasters.

Tom Butts
Editor
tbutts@imaspub.com

LETTERS

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

Big Deal

Dear Editor:

I just read the article "NBC Nightly News goes HD," and your editorial in the May 2, 2007 issue of **TV Technology**.

I'd like to start off by asking, who cares? I'm in a rant about this because, it's just another article along the lines of "gee, look what were doing with new HD cameras—and not much else." It's not just your magazine, but other trade publications as well.

Real HD "broadcasts" are not here yet. Anyone who thinks so, including Mr. Brett Holey, program director of "Nightly," is kidding themselves. It's the same studio picture with Brian Williams reading a teleprompter—so what. OK, you built a new studio and you bought HD studio cameras and now you have to show them off. Why don't you get everything else on board for a serious, all-inclusive HD broadcast?

HD television broadcasts need to be complete. The entire production chain, from gathering HD field pictures of a story, editing, and adding graphics for delivery is not happening. I'm sick of watching everyone produce a partial entry into a HD production. Take a hard look, it's a square production in a widescreen, high-resolution format.

Even the HD-compatible graphics are all brought into the 4:3 aspect ratio, the switching between NTSC tape and remote cameras to HD studio sources leaves me cold. Now it's standard operating procedure to show some kind of "fill" image on the left and right sides when switching to and from NTSC, whatever the source is. And why would anyone spend a ton of money to reproduce the show theme in 5.1 surround? For what, to hear some instruments behind your head? How stupid. Why would you want to watch a news program, broadcast in surround, when 99 percent of the program is center channel dialogue?

This once again shows that network news divisions are more concerned with the fluff of fancy studio pictures of their star anchor, fancy swishing graphics, and surround sound, than with producing a serious attempt at communicating news content.

Mike Jory
Castro Valley, Calif.

Lighting the Way

Dear Andy Ciddor:

I just finished reading your latest column, ("Lighting Another LD's Show," Let There Be Lighting, May 2). Once again you hit the mark beautifully.

I do a number of shows where you have to ask all of those important questions, such as "Whose show is this, anyway?" Sometimes the answer leads you to a truck full of equipment, and other times you can walk in with a handful of gels and a light meter. Negotiating for an hour of someone's time to smooth out some contrast-y levels on a dimmer can make all the difference in the world to the televised portion of an event.

More than once I've had to work with other LDs on a show who were less familiar with the video realm than they were the concert circuit. I have found that it helps to remind them that (in the cases I was dealing with), it was more important to have it look good to the hundreds-of-thousands of people watching the event on TV than it was for the 4,000 who were in front of the stage. They usually get it when you put it that way.

Thanks for your columns. After my own 30-plus years in the business, it's nice to read something as relevant and useful in the trade magazines as your column. Keep up the good work.

Bruce Aleksander
KTRK-TV
Houston

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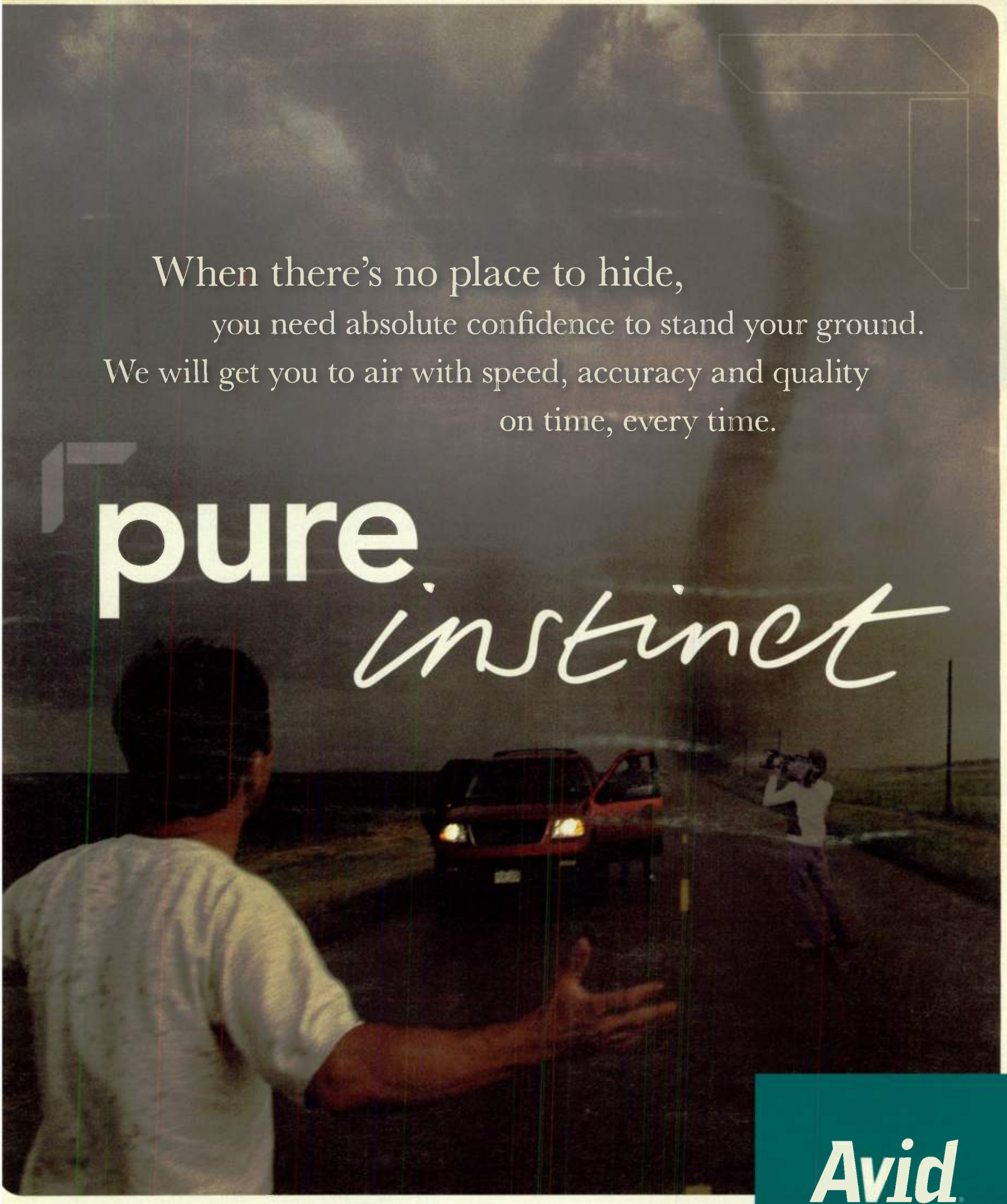

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LG Chief Touts Mobile TV

Dr. H.G. Lee, president, CTO, LG Elextronics

One of the highlights at NAB2007 was the formal introduction of MPH, a new mobile video service developed by broadcast company Harris Corp. and LG Electronics, one of world's largest consumer electronics manufacturers. Designed for broadcasters who want to send their broadcast signals to mobile devices, the service competes with a A-VSB, a similar in-band mobile digital broadcast technology developed by Samsung and Rohde & Schwarz and also demo-ed at the show.

Developing the actual technology is the easy part; making it a working, marketable service that will attract consumers already bombarded by a wide variety of mobile entertainment options is the hard part.

At the show, TV Technology Editor Tom Butts sat down with Dr. HG Lee, president and CTO of LG Electronics, to discuss the past, present and future of MPH.

Q&A

LAS VEGAS

TV TECHNOLOGY: Regarding, MPH, we haven't really seen any third party tests. Do you plan to submit your technology to the ATSC or CRC in Canada?

DR. LEE: Yes, but we haven't finalized the details yet. This is moving fast, but it's all in due course. We have no reason to delay it either. We think we have a really solid technology. Right now we're at 97 percent, so we think it's 'good enough,' but we still have to clean up some little things to make it solid and robust. That's when we think we should go to the ATSC.

TV TECHNOLOGY: It sounds like you and Harris are going it alone on this. What does LG plan to do to increase support beyond one large consumer electronics company and one large transmission company?

DR. LEE: We need to get more feedback from broadcasters about how urgently they feel they need to get into the mobile TV business. So far, we're getting fairly good signals. Many people think there's no reason to wait; some broadcasters want to start immediately, so our priority will be finding a good broadcast company and support them to get started in terms of setting them up with the tests and going through the initial business plan.

Eventually this has to be an all industry thing, so we really should work together. One company going it alone would have a limited reach, but we've got to have more companies on the consumer electronics side as well. We need to have many good companies to participate in bringing many different form factors—it could be mobile phones, it could be portable DTV, it could be some portable navigation device adding this capability, or even the iPod.

TV TECHNOLOGY: Other than the fact that both A-VSB and MPH are in-band technologies, are there other ways that the two technologies are comparable?

DR. LEE: Because they are both in-band means there are some similarities, but when you get into the details, they are very different in how they visualize the data streams and so forth. There are some significant differences. There are also some basic differences, such as diversity antenna versus a single antenna, the need for a cellular broadcasting approach as opposed to a single tower. The architecture is a little different.

TV TECHNOLOGY: Why is MPH better than A-VSB?

DR. LEE: First of all, we have seen already that we can get very solid reception under various challenging conditions, under freeways, under overpasses, between large buildings. Robust reception is the major thing.

In addition, Zenith and LGE have the most real data captured. We have done this analysis for more than 15 years. All the data that has been captured has been analyzed and we know all the details. On mobile solutions, we have done more than five years of research; we have the most real captured data than any other consumer electronics company. We invented VSB and E-VSB, so this is a natural outcome.

In terrestrial and HDTV reception, our chip technology is now in its sixth generation. We've been continually improving the reception capability.

These experiences, together with our long history with VSB, combined into MPH, means that we know what could go wrong. Once we offer a solution, it better be almost perfect.

TV TECHNOLOGY: For the immediate future, will MPH be restricted to the United States?

DR. LEE: Definitely, but Latin America has a lot of interest in mobile, too. When the ATSC was trying to have more countries out there—many of them in Latin America—adopt ATSC, many of the competitors said 'no, no, no, forget about it, because there is no mobile.' They didn't have mobile either, but they were saying they were better. Now with this demonstration, suddenly there's renewed interest. Now ATSC has some in-band mobile capability, which no other technology has. So this will be a very interesting change for some other governments including Argentina and Chile, for example.

TV TECHNOLOGY: Do you think this will help improve the adoption of ATSC in other countries?

DR. LEE: Oh yes. It's not only technical, but there's a lot of political situations in different countries. Some countries who were favoring the European technology tried to find reasons to blame ATSC or oppose ATSC. So far the biggest issue that ATSC has had to deal with was the lack of mobility. It's clearly the number one issue and the ATSC has been suffering because of that. Now with MPH, suddenly ATSC has become stronger in mobile. It will be interesting to see how this plays out in South America and other countries.

TV TECHNOLOGY: Does ATSC standardization matter to the success of MPH?

DR. LEE: At this early stage, there will be people concerned about making a decision with the wrong technology, so standardization will give them comfort. But realistically, other people are concerned that standardization could be a lengthy process, particularly when there are competing technologies. If standardization could be taken care of very quickly, that's good for business, but what if standardization becomes a lengthy process? Will there be broadcasters simply sitting there and waiting, or will some of them decide, 'well, I think this is good enough so why don't I just get started.' We wouldn't say no to people who want to get started before standardization.

TV TECHNOLOGY: So do your plans still call for deploying MPH regardless of where it stands in the standardization process?

DR. LEE: We wouldn't simply be waiting for standardization before we deploy it in some applications. Also, deploying it in some applications might help expedite the standardization process.

TV TECHNOLOGY: There's still some skepticism about the market for mobile video. What can LG do to change that perception?

DR. LEE: Seeing is believing. People don't know what to expect. Up until now, nobody knew what was possible and how much money it would cost to deploy any new technology. We believe the beauty of MPH is that first of all, in terms of investment, it's very nominal. Also, it's not likely that the FCC would get involved in regulating [MPH]. There's really no regulatory issues, as far as we can see.

We will try to introduce MPH probably sometime late this year and try to get some actual business early next year. So once people begin to see this mobile platform and some of the early adopter broadcasters go ahead and get this thing going, people will be encouraged.

TV TECHNOLOGY: How much will it cost to add MPH service to a mobile device?

DR. LEE: We think it will be probably $50-$60 in additional costs adding MPH for consumers. So many people will say it's no big deal for free service. Fifty dollars more? Why not?

TV TECHNOLOGY: So you're saying an MPH-enabled phone will cost, on average, $50 more than the average cell phone?

DR. LEE: It's a little difficult to say, but it's nominal. There are other variables in deciding a phone's price, but in our particular point of view, it's not a huge additional thing.

TV TECHNOLOGY: Do you think that broadcasters should provide MPH for free?

DR. LEE: We are providing the capability. How it's used is really up to the broadcaster. But I think that there will be some broadcasters who think free service will be viable and there may be some others who can invent some very attractive paid service. Eventually it could be a combination of both. ■

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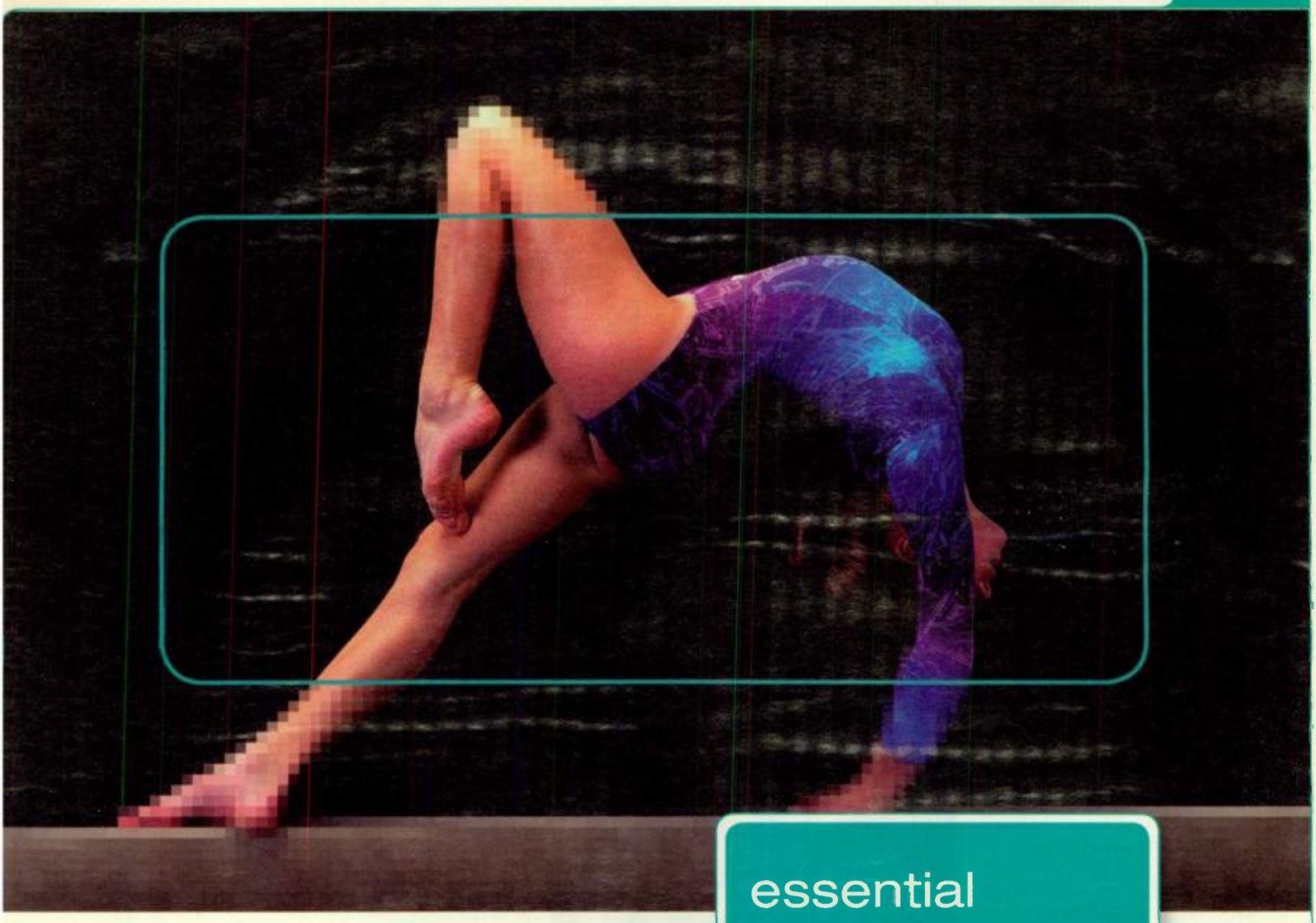

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Record Camera Swap at QVC

Forty HD units go online in 12 hours

by James E. O'Neal

WEST CHESTER, PA.

"All right, we have just two left—just two before we run out," intones a QVC employee. "We've going to have to close this out soon."

No, this isn't a household item being sold with the usual sales patter heard on the QVC network. It's spoken this time as part of the effort to make sure that the marathon camera-swapping program the network has embarked upon stays on schedule.

Early in 2006, QVC decided that it was time to replace its aging standard-definition Sony and Hitachi studio cameras with Sony HDC-1500 high-definition models. A total 40 new cameras were ordered, along with Canon HD lenses. Plans were made also for upgrading camera robotics with new Vinten units supplied by Vitec.

"What a lot of people don't understand is that we're one of the largest multimedia retailers in the world," said Angie Simmons, QVC senior vice president of broadcasting and TV sales. "One of the biggest things we're concerned with is making sure our customers can make a really informed buying decision. For us, it was a natural transition to upgrade our studio facility—allowing customers to see merchandise more clearly. With items such as jewelry and apparel this makes a big difference. This was the big driver for us."

Under any circumstances, an equipment removal and installation project of this magnitude is not something to be rushed into. And after it was determined that the cameras could not be installed on a "staggered" or phased-in basis, QVC personnel, at all levels, began a lengthy series of planning meetings and dress rehearsals on the best way to accomplish the project.

It was ultimately decided that the engineering personnel would be allowed only a 12-hour window in which to perform the switchout. This amounted to just 18 minutes per camera.

WHY THE RUSH?

Has there ever been such a rush to put new television cameras on the air?

Probably not, according to Ron Schiller, QVC's director of broadcast engineering and technology. But this was a special case. As all of QVC's telecasts are live, 24 hours per day, there was no downtime available.

Schiller further explained that there was really no choice when it came down to an all or nothing camera replacement. It was felt that if the change-out were to be performed over an extended period, viewers would notice inconsistencies in the appearance of products being offered for sale and that could have a negative impact on business.

"Being a live retailer, we didn't have the luxury of switching cameras over at will," he said. "In our testing of cameras, we saw that there was a real discrepancy in the way they looked over the air. This was based on our in-house testing with typical products."

QVC (Quality, Value, Convenience) is one of the largest retailers in the world, yet possesses only a handful of retail stores. The majority of the business comes from electronically pitching products to prospective customers via television and 23 on-camera hosts.

And business via the airwaves is good.

On one record-setting occasion, viewers committed $80 million in orders in a single day. The QVC record for orders shipped in a single day exceeds 246,000 units, and the operation boasts a record 24 million hits in a 24-hour period on its Web site on the occasion of QVC's 20th Founder's Day in June 2006.

QVC

QVC Engineer Mike Sheffer connects one of the 40 new studio cameras.

QVC

Sony representative Steve Flynn (foreground) and QVC System Engineer Frank Palmisano make sure everything is just right with one of the new CCUs.

TELEVISION AS IT USED TO BE

Since television is the heart and soul of QVC's marketing operations, the broadcasting facility here is big, with no expense spared to make it absolutely first rate. There's both a very large physical plant and equally large production and engineering staffs. Electrons flow through some 400 miles of cable here.

In many respects, operations at QVC are reminiscent of television as it existed in the early 1950s—before there was a lot of network-supplied programming and before video recording technology was available. To ensure a steady flow of programming, larger stations relied on multiple studio setups, with programming shifting from one theatre of operations to another throughout the day.

The QVC facility features a 20,000-square-foot main studio, with an enormous home set occupying most of that space. The set is a one-of-a-kind effort, in that it accurately replicates virtually all areas of a large American home—complete with an outdoor sundeck and very large bathroom with all fixtures plumbed and operational (with the exception of the toilet). Other amenities in this "home" include three different kitchen areas, a formal dining room and even an operational fireplace.

The "home" is A/V wired and lighted so that broadcasts can take place from any area, hence the need for 40 more or less permanently stationed cameras.

The QVC production facility also includes a 135-seat audience participation studio and a fully equipped set and scenic construction shop and storage facility, which was typical of most medium- to large-sized television operations when the majority of programming was live and locally produced. There are also four green rooms. About the only thing missing are staff musicians.

GUINNESS RECORD?

It's doubtful that the Guinness World Records book will ever have a category for camera swapping, but if it did, based on the work that went on here, the QVC operation would probably qualify for the top slot.

The operation began on schedule and without fanfare at 6 p.m. on May 23, and continued until 6 a.m. the following day.

More than 200 people were involved in the mammoth operation, which involved not only camera head and CCU replacement, but also installation of new robotics systems and lenses, as well as a change from copper cabling to fiber in some areas.

To make the proposition even more intriguing, new Sony studio switchers and a plant router were also involved. Beck Associates, an Austin, Texas-based systems integrator, was given the responsibility for overall integration efforts.

"We had some 40 support vendors from the different companies involved, plus our own technical and operational staffs," Schiller said.

Once the commitment was made for the camera swap, the network initiated a large-scale training and logistics program involving virtually everyone even remotely connected with air operations.

> **"Being a live retailer, we didn't have the luxury of switching cameras over at will."**
>
> **—Ron Schiller, QVC**

"We initially met every week," Schiller said. "Then, as we got closer, twice a week, and then every day. People had to be trained to use the new equipment too. Our training program started in January of this year. It didn't just cover camera operations, but involved production switcher training and many other areas."

"This technology change had an impact across all of our broadcasting operations," Simmons said. "This included lighting, makeup and how our products are shot—there was a lot of learning. This has been really an exciting time for us, both the learning experience and the new technology."

Schiller said that the operation went surprisingly smooth, but he added that no one took any chances or left anything up to the imagination.

"We had developed a good plan and there was a good execution," he said. "Every possible risk was anticipated as much as we could. We addressed everything that we thought could go wrong, but really none of what was anticipated happened."

"For a project of this scope and magnitude it was really anticlimactic,"

QVC, PAGE 16

World Radio History

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World Radio History

Television's Past Draws Record Crowd

John Battison looks back on his eight decades in television

by James E. O'Neal

HILLIARD, OHIO

High-definition and mobile TV may have been the rage at this year's NAB, but neither appeared on the agenda of another international television technology conference two weeks later. Highlights of this event included a look at color as imaged on a 54-year-old receiver, a report from an eyewitness to John Logie Baird's 30-line television transmissions, a demonstration of television cameras specially made for airborne use more than 60 years ago and presentations on color kinescope technology and the invention of vestigial sideband transmission.

These were all part of the Early Television Foundation's fifth annual convention held at the organization's museum and nearby Makoy Center. This year's three-day event set a record for attendance, with more than 90 people from as far away as England and Belgium taking part.

COLOR FROM 1954

In addition to touring the ETF museum, which features numerous television receivers, cameras and other apparatus from the 1920s to the present, attendees got a look at just how good color could be, as seen on the CT-100, RCA's first production color receiver. There are several first-generation color sets at the museum, and one was selected for a complete alignment and critical setup.

By today's standards, the CT-100 seems incongruous with its gargantuan cabinet, providing only a 12-inch picture. (The set was described in a popular magazine as "looking like a small house trailer turned on end.")

Size and tube-count notwithstanding (36, plus the CRT), the ETF's CT-100 was one of the high points of the show, operating almost continuously with displays of NBC's early peacock animation and other vintage program material. Since the phosphors used in this set's CRT were designed around NTSC color standards, the color presented was especially pleasing, especially the true reds that could be generated.

Another crowd stopper was Maurice Schechter's demonstration of a complete television system designed during World War II for airborne use. It used a "miniature" iconoscope pickup tube and was equipped with an operator-activated thermite destruction system to prevent this cutting-edge technology from falling into the hands of the enemy during combat.

BATTISON SPEAKS

The nine presentations on the ETF conference agenda this year included a look at early color kinescoping, Allen B. Dumont's television operations, the origins of vestigial sideband transmission and early television activities at Kansas State University. However, the star of the show was John Battison, who was on hand to talk about his experiences in television.

Television pioneer John Battison (L), discusses details of his presentation with the organizer of the Early Television Foundation and Museum, Steve McVoy.

Battison, now 91 and the founder of the Society of Broadcast Engineers, became interested in television in the late 1920s when he read about John Logie Baird's experimental work. He skipped school on occasion to attempt viewing Baird's 30-line transmissions with a homemade mechanical receiver, "trying to get some pictures out of the air."

Battison recalled that resolution was so poor that independent verification was sometimes necessary to determine what he was viewing.

"You could tell it was a woman; you could tell that from the sound—the way she was singing."

After completing school, Battison went to work as a junior engineer for Ekco, a British radio and television manufacturer. The company was just starting to attract customers to its 10-inch television line when England became involved in World War II and the government shut down the country's only television transmitter to prevent German warplanes from homing in on the VHF signal.

After the war, Battison immigrated to America, periodically returning to England for visits. He observed that the television pictures there appeared to be just about as good on that country's 405-line transmission system as they did on the U.S. 525-line system.

"[That's] because we waste more lines out of our 525 than the BBC did with their 405," Battison said. "Now, of course, we're going to more lines—high definition—and I just wonder how much use it's going to be."

"People have asked me what do I think of high-definition television. Well, I think digital television is excellent. High-definition television—I don't know whether we really need it. Do we really need to see explicit sex in greater detail than we can today? The programming has not kept up with the technology. What we need to do now is to get some programming to make it worthwhile."

"I think digital television is excellent. High-definition television—I don't know whether we really need it... the programming has not kept up with the technology."

—John Battison

During his early years in the United States, Battison spent some time working with Dr. Peter Goldmark in the CBS field sequential color project during the late 1940s. He later worked for ABC Television in starting up their New York City station WJZ-TV (later WABC-TV), and was instrumental in relocating the station's transmitter plant to the Empire State Building.

"I was up on the Empire State Building when the 200-foot extension was being opened," Battison said. "It was quite a sight, being on top of that building with only a few two-by-fours and some wire netting around you. Made me think later on about what OSHA would have done."

Battison spoke about other episodes in his long television career, which included starting up a television station in Calgary, Alberta, and construction and operation of his own station in New Mexico. From there he returned to England as director of engineering for the launch of commercial television in London.

Battison mentioned his consulting work in connection with the beginning of LPTV in the United States. He remarked that his small station in New Mexico was "in many ways the equivalent of today's low power in as far as the facilities we had. Low-power TV has had a very important, very strong impression on television, in broadcasting in general, because it's given small people the opportunity to get on the air and tell their story."

Battison said that LPTV set the stage for low-power FM and that he had been instrumental in putting several LPFMs on the air.

"They've done a fantastic job of broadcasting—running a station the way a station should be run—which is in the public interest, and not just turning out music and music and music," he said, referring to LPFMs. "Music is good but we need more than that. We need something for people to think about and to listen to, especially about public problems."

The Early Television Museum contains approximately 250 television artifacts, including about 40 pre-World War II television receivers. According to Steve McVoy, organizer of the event and founder of ETF, only about 250 American and 200 British pre-war sets are known to exist.

New to the museum's collection is a complete RCA TT-5 VHF transmitter, along with an outboard RCA 25 kW linear amplifier. The transmitter was originally used at station WTVN (now WSYX) in Columbus. It is still in the process of being restored and reassembled.

McVoy says that the date for next year's ETF convention is still being determined. ■

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World Radio History

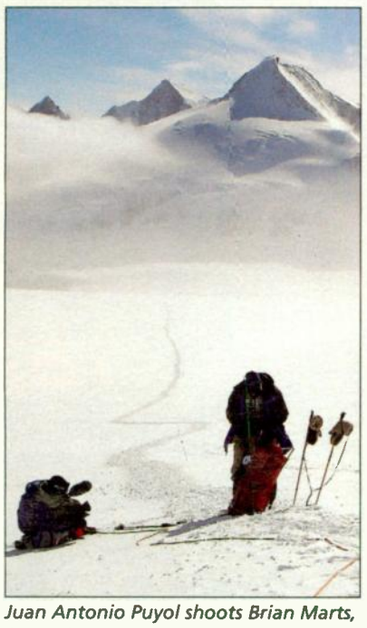
Hi-Def

CONTINUED FROM PAGE 1

reason to shoot in high definition," Puyol said.

Climbing the mountain is challenging enough for those who've attempted it once. But twice? This trip marked the triumphant return to Mount Vinson for four of the first explorers to ever step foot on the summit in 1966.

These men returned 40 years older and with Puyol to document their endeavor. All told, Puyol shot 30 hours of footage in 720/60p using a JVC GY-HD250 camera and a Fujinon HTs18X4.2 ENG/EFP lens. The final product, "Epic Returns: Revisiting the Top of the Bottom of the World," is now in post production.



Juan Antonio Puyol shoots Brian Marts, (one of the original party members) with Mt. Vinson in the bakcground.

WEATHER WORRIES

Mt. Vinson Massif, the highest point in Antarctica, is nestled in the Ellsworth Mountains of the Sentinel Range. Visitors arrive via the massive Ilyushin A-76 Russian cargo plane. They land on the Antarctic ice and climbers are then ferried via a Twin Otter to interior Antarctica for the ascent.

While the climb itself is not known to be technically challenging, a number of factors were potential inhibitors for the crew. The weather certainly was one, Puyol said. Throughout the climb, Antarctica's summer temperatures averaged between 10 and 20 degrees below zero Fahrenheit, dropping to 30 degrees below at one point.

Puyol, owner and founder of Proud Line Productions in Los Angeles, said he and his three-person crew faced other hardships.

"We didn't have time to set up shop and have retakes of certain shots because we knew that we were there to climb a mountain," he said. "Weather was an issue and our team members were a lot older and we knew anything we did to impede their progress would ultimately threaten their potential to make it to the summit."

Indeed, with four members of the crew now in their 60s and 70s, it was a chance for them to relive the past and savor their moment in history. While six of the original 10 scientists from the 1966 expedition are alive today, four made the December 2006 climb with two of the group's descendents joining the group as well.

Puyol, who has 10-plus years experience climbing everything from the Andes in South America to Yosemite National Park in the United States, carried about 40 pounds of Anton Bauer's HyTrons and Dionics batteries. He was able to recharge twice along the way with solar chargers. "But other than that we were just running off the juice we had and were pulling in tow," he said.

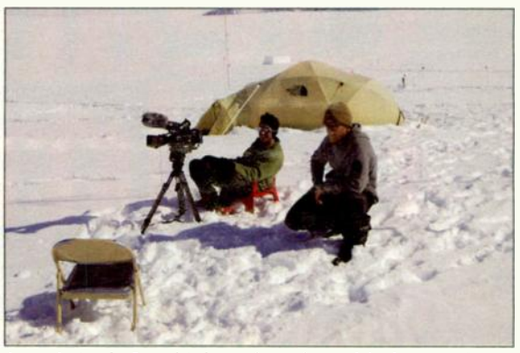
The crew also used a Sachtler DV 6 fluid head and K-Tek boom poles and windscreens for sound.

In an effort not to fall behind, Puyol and his crew would run ahead to set up the shots and then fall behind once the other climbers passed.

"To have to keep moving and knowing you can't stop, it was a struggle," he said. "You had to balance what you could shoot and what you couldn't and what would allow you to make it up along with everyone else. Otherwise, it wouldn't be much of a shoot if we fell so far behind we couldn't catch up."

"We didn't have time to set up shop and have retakes of certain shots because we knew that we were there to climb a mountain."

—Juan Antonio Puyol



Juan Antonio Puyol takes a breather with the team's head mountain guide, Tim Hewette.

HIGH MARKS FOR HI-DEF

Despite the unusual circumstances, Puyol gives high marks to the equipment.

The camera and lens worked extremely well, Puyol said. Prior to departure, he researched his needs and made the decision to go with JVC fairly easily, he said.

"I wanted a camera that was going to be able to get the quality of imagery I wanted and with that I knew I wanted to shoot in high definition.

"JVC's camera quickly stood out," he said. "It's a lightweight camera that produces great images and is a fully professional camera that has the option for interchangeable lenses."

JVC itself was equally impressed with the camera's endurance, as the company had not previously tested the camera in such cold weather.

"Obviously, the camera was being used outside of its specifications," said Craig Yanagi, JVC national marketing manager, Creation Products. "But to see it able to perform at those extreme conditions is simply amazing."

Puyol said he has used Fujinon lenses for years.

"I needed something that gave me enough range and had a good, sharp image. It did and it held up really well to all the elements we exposed it to. Nothing was treated lightly on the mountain. You just didn't have that option."

Dave Waddell, marketing manager for Fujinon, said the HTs18X4.2 lens is the company's highest-quality, ENG-style lens. Introduced at NAB2006, Waddell said using the lens in this type of situation proves its worth in the HD field.

"I think the fact that he was using a high-quality HD lens on the camera... says a lot for where we're going as far as HD is," Waddell said. "We're seeing a lot of interest in that type of package for applications, especially news, so it's something that looks like it's going to be a hot item."

TEST OF ENDURANCE

But the cold was really the true test of the endurance of the crew—and the equipment.

"I have to say, we got beat up and our gear got beat up really well on the climb," Puyol said. "We were constantly moving and if the winds kicked up, you were just getting dusted with snow.

"Half the time when I was hiking, the camera was just literally hanging off one of my straps on my backpack in front of me, banging me in the chest. I needed it to be readily accessible and just be able to start filming and to capture the image I wanted." ■

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NBC Upgrades Ops

Miranda, Signiant provide key tools

by Robin Berger

NEW YORK

NBC Universal is banking on Miranda Technologies' iControl system to make its engineers more efficient in overseeing the operations of its evolving realm of equipment.

The IT-enabled system is based on Simple Network Management Protocol (SNMP), which exposes variables to predetermined configurations. It addresses three goals: monitoring for potential equipment failure, controlling the interface between operations, and tracking IP video.

Installation began in March, both at 30 Rockefeller Center and at NBC's Television Stations Division. iControl at press time had been deployed across all of NBC's businesses, supporting news, entertainment, cable distribution and MSNBC programming, according to Larry Thaler, NBC Universal's vice president for on-air and production technology. He expected that iControl would be deployed at NBC's Englewood facility by the last quarter of 2007.

SNMP

Generally speaking, an SNMP network has three main components: managed devices (nodes that collect and store information), agents (a software module in each managed device), and a network management system to execute the apps that monitor and control the managed devices.

SNMP first appeared in the late 1980s, was defined by the Internet Society's Internet Task Force the following decade, and is currently in its third iteration.

"Version 3 of SNMP addresses some of the limitations found in early versions, namely security and privilege management," said Francois Gourvil, product development manager for Miranda's iControl product line. "Because SNMP first gained popularity in telecom before spreading to other industries, the pressure to improve SNMP by adding message encryption, user authentication and message integrity verification has come primarily from IT administrators and telecom engineers."

Gourvil noted that Miranda's iControl is used by both broadcasters and TV service providers.

According to the company, its Densité telemetry probes monitor signal paths, provide alarms, and enable video to be streamed back to the iControl system from key monitoring points—three features that duly impressed NBC's Thaler.

Thaler noted that iControl literally "announces" the condition of every piece of equipment needing special attention.

"For a power supply, it may send out an alarm that the voltage has gotten lower," he said.

In terms of operations control, NBC was able to pre-set configurations for incoming signals, thus enabling an operator at 30 Rock to push one button and adapt an incoming feed to the network's 1080i HD standard. Moreover, any of NBC's operations centers can see video presented to an encoder.

"The iControl system makes a low-res version of video and audio and transmits it over our computer network to wherever it is, anywhere in the world," Thaler said.

TIMING

Thaler noted that the timing of the installation was perfect to leverage the many SNMP-capable, high-definition systems that NBC had acquired over the last two years, as well as to fulfill the NBC Universal 2.0 corporate mandate to "take on new media services" with the same engineering head count.

"SNMP monitoring and the iControl system allow us to know the status of all our equipment," Thaler said. "We currently have over 2,000 devices that are being monitored today by this system. We expect that this will grow to an even larger number over time."

Among other things, the terms included an enterprise license that allows NBC to deploy the same technology across the whole company, thus precluding site by site negotiation. And the system is customized for single sign on.

"If you're a user of a Web-based application you have one sign-on password and user name that goes through all of the applications at NBC and GE," Thaler said.

OTHER UPGRADES

"We're always doing improvements to our system—we're doing thousands of things," Thaler said, noting thereafter that the bulk of these never get mentioned to the press.

Another improvement NBC deemed worthy of mention was a deal with Burlington, Mass.-based Signiant Inc. NBC Universal selected Signiant's Digital Media Distribution Management Suite to transfer large HD files and deliver media to alternative distribution outlets.

"Signiant's technology was a key asset to the production of Universal's 'Bourne Ultimatum,' allowing our production units to seamlessly and securely move content between shooting locations and post-production houses," Thaler said. "The digital distribution system significantly diminished the traditional obstacles of time zones, file sizes, formats and shipping."

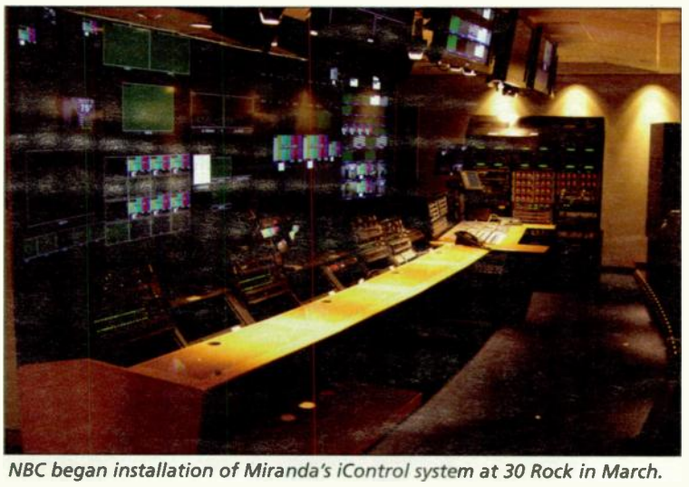
Like the two previous films in the Bourne trilogy, "Bourne Ultimatum," due for release this August, followed the story's many locations to the letter. If the script said "Tangier," the crew shot in Tangier, not a more convenient site, then folded the tent for Berlin, London, Madrid, New York, Paris, Riga (the capital of Latvia) and the District of Columbia, according to reports.

Compatibility and rapid deployment also won high marks.

"Thanks to Signiant's unique open and integrated technology, we were able to rapidly deploy a solution that fits seamlessly with our existing infrastructure," said Rab Mukraj, NBC Universal's director of distributed media management. ■

"We currently have over 2,000 devices that are being monitored today by this system. We expect that this will grow to an even larger number over time."

—Larry Thaler, NBC



NBC began installation of Miranda's iControl system at 30 Rock in March.

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Broadcasters Tackle Software Architecture

Is SOA the future for file-based workflow?

by Robin Berger

LOS ANGELES

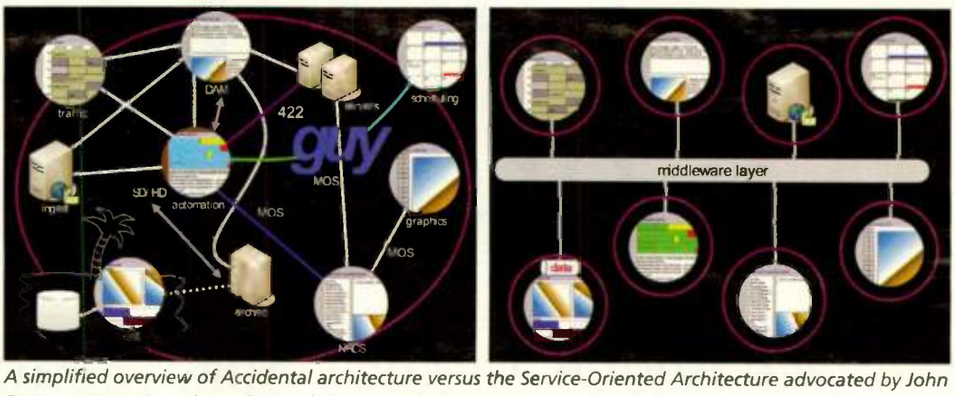
Convinced that its mission to create two key interfacing formats was largely completed, the Advanced Authoring Format Association has reinvented itself into the Advanced Media Workflow Association, or AMWA.

Now the group's mission is to put its products to work, according to association president Brad Gilmer.

Among the AAF's best known handiwork was the co-creation of the Material eXchange Format, which is targeted for storage, play-out and broadcast. Members of the seven-year old group include broadcasters (BBC, Turner Broadcasting and Fox), system integrators, manufacturers, software providers, and consultants to the TV industry.

High on the list of the new agenda is a uniform approach to software architecture.

"We had discussions with members, sponsored a survey that CNN helped us with to find what were critical areas, and we identified that coming up with a uniform approach to software architectures was a real important piece," said Gilmer, president of Gilmer & Associates, a media consulting firm. "We're trying to foster a dialogue between system architects, integrators, users working on implementations, and manufacturers looking to build products that work in a software-based environment."



A simplified overview of Accidental architecture versus the Service-Oriented Architecture advocated by John Footen, AMWA board member and National TeleConsultants director of software systems engineering.

One of the options being considered for the approach is Service-Oriented Architecture, a philosophy independently explored for at least 10 years in various permutations. And despite the growing buzz around SOA, there remains little agreement as to what makes an architecture service oriented.

WEB-BASED?

Readily conceding the lack of agreement on what SOA is (let alone should be) is John Footen, director of software systems engineering for National TeleConsultants a strategic media and entertainment consulting firm based in Glendale, Calif., which joined the association this year. According to Footen, now that the presence of file-based workflows has reached the tipping point in the TV industry, many vendors are touting their SOA capabilities.

"The majority of them are defining their SOA enablement as Web services when, in fact, SOA is a philosophy [that] may or may not be Web-service enabled," said Footen.

Footen has been delivering SOA presentations to the TV industry for about two years, enlightening audiences at IBC, NAB, and various SMPTE conferences.

He was tapped to chair AMWA's technical working committee for software architectures during the association's May 9-11 conference, its first face-to-face meeting regarding the topic, AMWA's Gilmer said.

Gilmer believes SOA could enable the TV industry to establish a framework within which different application areas can be defined, and thus fit into the right sweet spot of a work-

SOFTWARE, PAGE 18

QVC

CONTINUED FROM PAGE 8

Simmons said. "From my standpoint there was, of course, the last minute anxiety of cutting over, but it went very smoothly. Our people were all focused on a common goal. This included our control room staff, floor managers, security people—even our commissary. Everyone understood their role and helped to make it happen."

According to Schiller, there were some last minute changes and touch ups to the master plan, but even that contingency had been anticipated.

"We had set up a command center with technical triage to disperse personnel as needed," Schiller said. "We had two staging areas and teams with subject matter experts—engineers from both Beck and Sony—to deal with any last minute issues."

At the end of the ordeal, Schiller reported large numbers of exhausted personnel prostrated on studio and hallway floors.

"That was one *big* caffeine letdown crash," Simmons said.

Schiller and Simmons said that the network would be hosting a "victory celebration" party later this month for all hands involved.

Schiller pointed out that even though HD cameras and switching gear had been installed, the network would not be jumping to HD operations just yet.

"We're production-ready now in terms of being able to do multiple formats," he said. "And while we're not announcing any HD plans, we are positioning ourselves to be ready when the time comes."

Will the retired cameras be offered for sale on QVC?.

The answer is no.

Actually, plans for disposal of the obsolete cameras had been made months before the May 23 event.

"All of them were already sold before we started removing them," Schiller said. "They're all gone now. In fact as soon as they were pulled out they were placed on pallets and from there went to trucks that were waiting outside to take them to their new owner." ■

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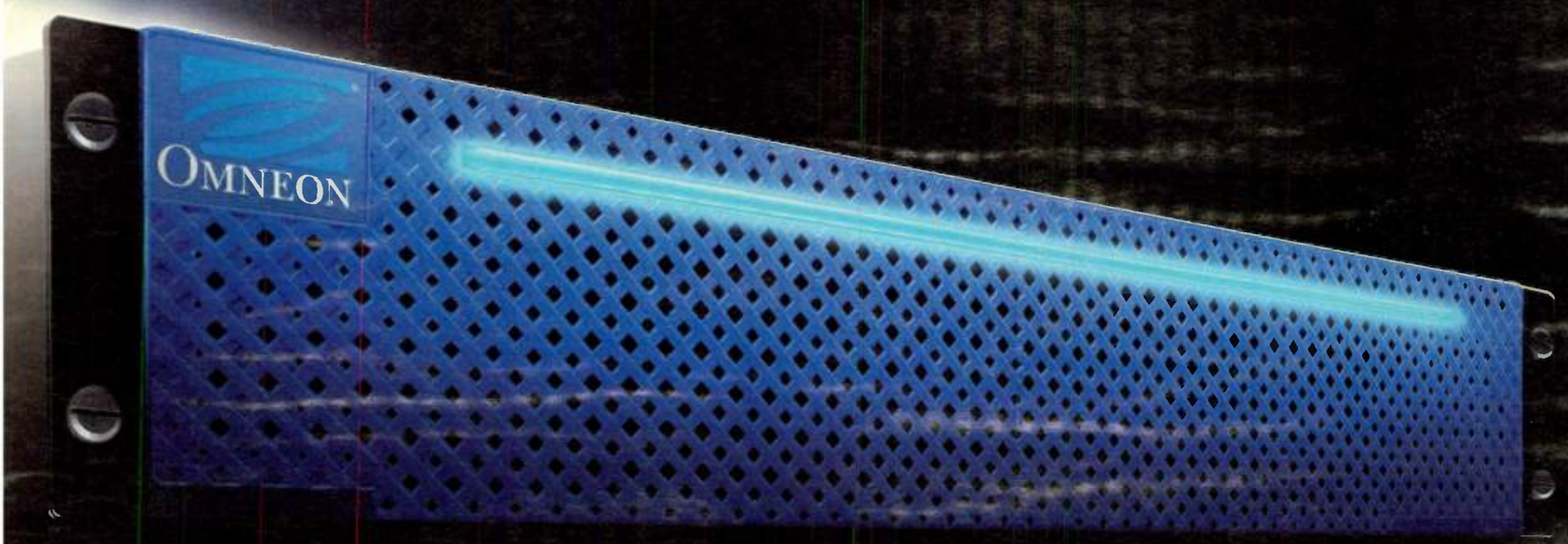

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World Radio History

Software

CONTINUED FROM PAGE 16

flow. But before that can even be contemplated, he said, Footen's committee had to actually opt for SOA.

At the May conference, Gilmer said, "I asked them if we were going to use SOA or are we going to use something else? There are different software architectures available. Before we presume SOA, let's just be sure."

And, he said, if the group did opt for SOA, it needed to decide what aspects of SOA to tackle, as well as the scope of the group itself and the framework for software-based architectures for broadcasts.

Clyde D. Smith, senior vice president for global broadcast technology for Turner Broadcasting Systems, noted that interest in SOA is "high at the major network levels," where flexible interoperability is seen as key to new relationships and market opportunities between program producers, distributors and consumer device manufacturers.

"Presenting applications as services permits you to introduce a layer of abstraction," Smith said. "If you abstract your workflow from the application-specific details of how a function works, you may readily make changes in the platforms and applications without having to redefine the workflows. Additionally, you now have created reusable services, which will also enable you to change workflow without having to change the technology."

Chris Lennon, director of integration and standards for Harris Software Systems approves of AMWA's recent moves. "Harris is very pleased with AMWA's recent decision to form a group focused on software architecture, including SOA," he said. "In fact, I am happy to report that Harris has just recently joined the AMWA, largely because of this."

Lennon also noted that, "We have received a great response to new software that we have developed using an SOA approach, and look forward to working with the AMWA and the industry in general on standardization efforts in this area."

Ken Fuller, vice president of technology for systems integrator Ascent Media, had a more measured approach to SOA. Ascent Media was one of the founding members of the association; Fuller has been a board member since January. He believes it's high time the TV industry got its workflows optimized, perhaps by "some kind of SOA middleware and maybe Web services." But he stopped short of seeing SOA as a panacea.

"I think that it's very significant, but it's still quite new—the concept of taking that notion into the media and entertainment space," Fuller said. "Service-Oriented Architectures have had success in the healthcare and financial areas. Part of the issue going forward is introducing the notion of a Service-Oriented Architecture into a real-time, media-delivery architecture."

In fact, Fuller was skeptical that SOA could work in real time.

"I don't think it's necessarily going to work its way into the actual playout," he said. "It may find a home in overall workflow management—integrating archives with rights management with asset management with transcoding, ultimately feeding into an automation system [that] may have the autonomy to actually do the playout architecture in real time. You're kind of using it more to integrate the workflow with back office functions."

Footen says AMWA would form its Software Architecture Technical Subcommittee over the next few weeks. Then he hopes to move to a common language and goals. "One of the first tasks will be deciding what the committee will be doing, then we will be defining our terms," Footen said. "That would allow us to speak the same language about the subject."

He's ambitious about the task at hand.

"We will be looking to address what are optimal architectures for designing systems and recommendations regarding best practices, approaches, templates and perhaps things that in the future can be standardized by SMPTE," or another group, Footen said. "We need to move quickly to make sensible recommendations that can be published and put out to the industry relatively quickly."

STANDARDIZATION

The European Broadcasting Union has already recommended that its members adopt service-oriented architectures in "The Middleware Report" that it issued in 2005. Since then, Footen said such projects have been done by at least three broadcasters in Europe and several have begun in the United States as well.

"No U.S. industry group has taken this on yet," said Footen, who's on the SMPTE S-22 Working Group on Data Exchange committee. "There's work going on in that committee that is starting to approach this from a technological standpoint. But, as yet, there has been no specific SMPTE-related work regarding SOA."

He believed AMWA's initiative could kick start the process by presenting the prospect to SMPTE "in a more fully formed way."

"AMWA would be an excellent place to get the work started," he said.■

World Radio History

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World Radio History

Going it Alone

In small markets, broadcasters take the DIY approach

by Dan Slentz

ZANESVILLE, OHIO

WHIZ-TV is a family owned AM/FM/TV station with no other broadcast interests. The two principal families which own the station have always had a strong commitment to serving the community.

I became the station's third chief engineer about two years ago. This is my first experience as the chief of a full service broadcast facility. As the local NBC affiliate, we feature about 14 hours of local news each week, plus a plethora of locally produced programming from local sports to entertainment shows.

When I came on board, the TV station had just upgraded to a new transmitter facility, tower and broadband antenna for its analog and digital channels. Most, if not all, gear associated with everything prior to the transmitter building still dated from as early as the 1970s (a few pieces even earlier).

The master control switcher was a Vital production switcher that used the tally function to trigger Collins audio cards with an RCA board face for audio control.

Production control was being switched off an ISI switcher with outboard 3D effects unit and tally control interface into the above mentioned audio control. Neither switcher was in very good condition.

On the left, the WHIZ-TV master control facility as it looked in 2005; on the right, the new MC takes shape, with senior master control operator Charlie Little and another master control operator, Tom Hatfield, in the background.

All programming not airing live was recorded and played back via DVCPRO. All news segments were also placed on DVCPRO for the news tape shuffle. Spots were played from an eight year-old Leitch VR300 M-JPEG server. Spots loaded by Fastbreak/Sundance, but playback was started manually. A single-channel analog Deko was used for character generation. Even video was monitored by a host of older CRT-based monitors in varying condition.

Although there were patchbays, there was no router in the facility. Documentation on the existing wiring and some of the home brew circuits was limited. A large amount of very old wiring dating back to possibly as early as the 1953 construction still existed. Some wiring troughs were so full that pulling more cable could not be accomplished without a lot of overdue house cleaning.

The actual building housing the station had seen few upgrades over the years. Fortunately the incoming electrical service had been upgraded with new service and breaker panels when the new transmitter building was constructed in 2002.

The master control area had no ceiling or walls dividing it from more common areas like the news editing room, hallways, or the hallway leading from the foyer/waiting area. Electrical connections made within the 1953 RCA rack-mounts had exposed 110 V connections. HVAC was accomplished with two ceiling-mounted (if a ceiling existed) units with no duct work on one, and a short feed section on the other. In other words, the air circulated in a small pattern around the center of master control leaving other areas with stagnant air.

The rest of the facility was similarly outdated. What made the facility interesting was the fact that so much

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that was retired (when it was no longer needed) was simply left where it was last used. Drawers contained 16mm news film cameras, lights, and audio gear. Old RCA ribbon mics from 44 juniors to StarMakers were left in boxes. Even old Quad VTRs and cameras still sat in storage.

STARTING OUT

During my first year at the station, I spent a lot of time learning the operations as well as upgrading the radio station. The upgrade included gutting our 50 kW FM station's studio to convert to digital (for a future conversion to IBOC). Another part of the initial upgrade included replacing the critically ill and outdated ISI production switcher that was used on a daily basis.

Without a clear path for our future plans and the lack of flexibility without a router and a production switcher for a master control switcher, interfacing a modern switcher would not be easy.

Prior to my arrival, a new Ross Synergy 2 had been purchased to replace the ISI switcher. I was familiar with smaller Ross switchers, but hadn't had experience with integrating an SDI switcher in an analog facility. Fortunately Ross was an excellent company to work with. The Ross techs were extremely helpful in teaching a crash course on SDI integration. The only disappointment would be the fact that the switcher was not purchased with HD in mind; it's strictly an SD switcher.

To continue to work with the vintage gear, it would be necessary to dumb down some of the interfaces. The tally of the Synergy would need to temporarily be used for audio switching during newscasts, yet I'd need to plan for the revamped facility to the point that any new gear incorporated would need to transition smoothly from the original facility to the redesigned facility without missing one newscast.

The design, build and integration has been months in the planning and construction is proceeding on the overbuild/rebuild.

The TV building was over 50 years old and had seen minimal upgrades. Clearly, the lack of security in the master control area, combined with the lack of air filtering, updated and safe electric, power protection, and adequate HVAC systems had to be addressed.

Additionally, the facility lacked any thought-out workflow pattern, no break area, no redundancy or back-up plan for the facility, an over-crowded newsroom, and some systems that needed to be improved to meet the needs of multichannel digital and HD.

Many individual discussions with managers, staff members, industry integration representatives, site visits to larger stations, discussions with friends in the industry who know facilities and upgrades, and hundreds of hours of research and paper designs have created a path to our update.

PRIORITIES

In reviewing the facility, we realized we needed to create a much more efficient workflow. A lot of the gear needed to be replaced, but the budget would be too great to do everything at once. We did need to improve many crucial systems quickly, but needed to replace them in a logical order.

We replaced the ISI switcher with the Ross Synergy 2 because the ISI was about 30 years old and parts were failing (chroma-key on a regular basis). The master control switcher had to be replaced, but due to contemporary designs of MC switchers, adding a router would be necessary.

The lack of adequate monitoring meant buying monitors capable of SDI inputs and replacing so many failed/failing monitors at once. Adding in the HD and multichannel ability to the master control room made our decision to go with a multi-image display system a logical choice.

After months of research evaluating products, viewing demos, and speaking with industry leaders and integrators, we chose Harris/Leitch products for a majority of our upgrade needs. This included full routing, master control switching, and a multi-image display system. Some of the Leitch products were still in earlier development, but the Harris reputation and our past history with that company made them a clear choice as our partner.

The redesign of our facility has taken place and demolition and reconstruction is underway. I've found Microsoft Visio to be an excellent and inexpensive program for building planning, flow charts, and even documenting.

To date, we've added a break room that doubles as a small secondary or emergency TV studio. We've also created new wiring paths via homemade cable ladders and begun cleaning out rack space. Electrical upgrades, a new wall in master control, and an additional 9 ton air-conditioning unit have been added. Many areas have received a new coat of paint, and a small green room has been added. Wiring diagrams and gear planning is almost complete.

Shortly we'll begin pulling wires and permanently locating the new gear. With just two months until our Sept. 3, 2007 launch date, we have a lot of work ahead of us.

Slentz is chief engineer for WHIZ-TV, . ll work is being done by Slentz and Assistant Engineer Bill Hicks.

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World Radio History

Don't Get 'Lost in Translation'

Variety of video formats demands strict attention to cross-conversion

by Craig Johnston

SEATTLE

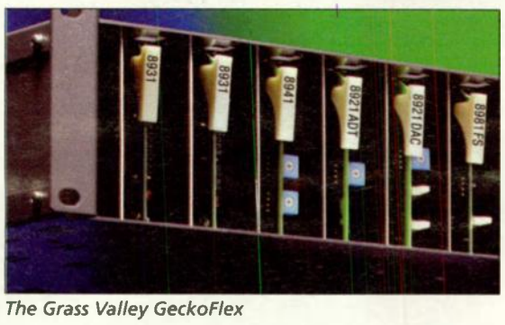
In the beginning of the DTV era, it seemed so simple: there would be standard definition video and high definition video. Sure, you'd have to be able to convert signals between the two, but did anybody have any idea there were going different flavors of HD? This added the term cross-conversion to up-conversion and down-conversion.

Not only does the United States have 18 different DTV standards, including 1080i, 720p, and now 1080p, but there are also various compression schemes, not to mention transport wrappers for file-based video. And once video comes from overseas, there is likely a different frame rate as well.

ANYTHING IN ANYTHING OUT

Standards converting signal processors, once specialty devices purchased only by international broadcast news outlets and boutique video houses specializing in converting between NTSC, PAL and SECAM, were now necessary items in broadcasting operations and mobile trucks.

A host of companies have answered the challenge with agile signal conversion products, capable of taking nearly any format in, and spitting nearly any format out.



The Grass Valley GeckoFlex

Many of these devices can autosense the input signal, relieving the need for an operator to set the system for a particular input format. Many also have audio capabilities, including embedding and de-embedding audio from the input signal.

"In this changing world where ABC is a different [high definition] format than NBC, and Fox and CBS, they all run different formats," said Mike Poirer, director of communications and product management at Teranex in Orlando, Fla. "So when you're exchanging between one network and another, you need to be HD, but your HD may not be their HD."

Teranex offers its VC100 Frame Synchronizer and Format Converter, available in single and dual channel configurations. In the dual channel mode, the channels can operate independently, or process a single input to yield two different format outputs. (A one-in, two-out option is also available for the single-channel VC100.)

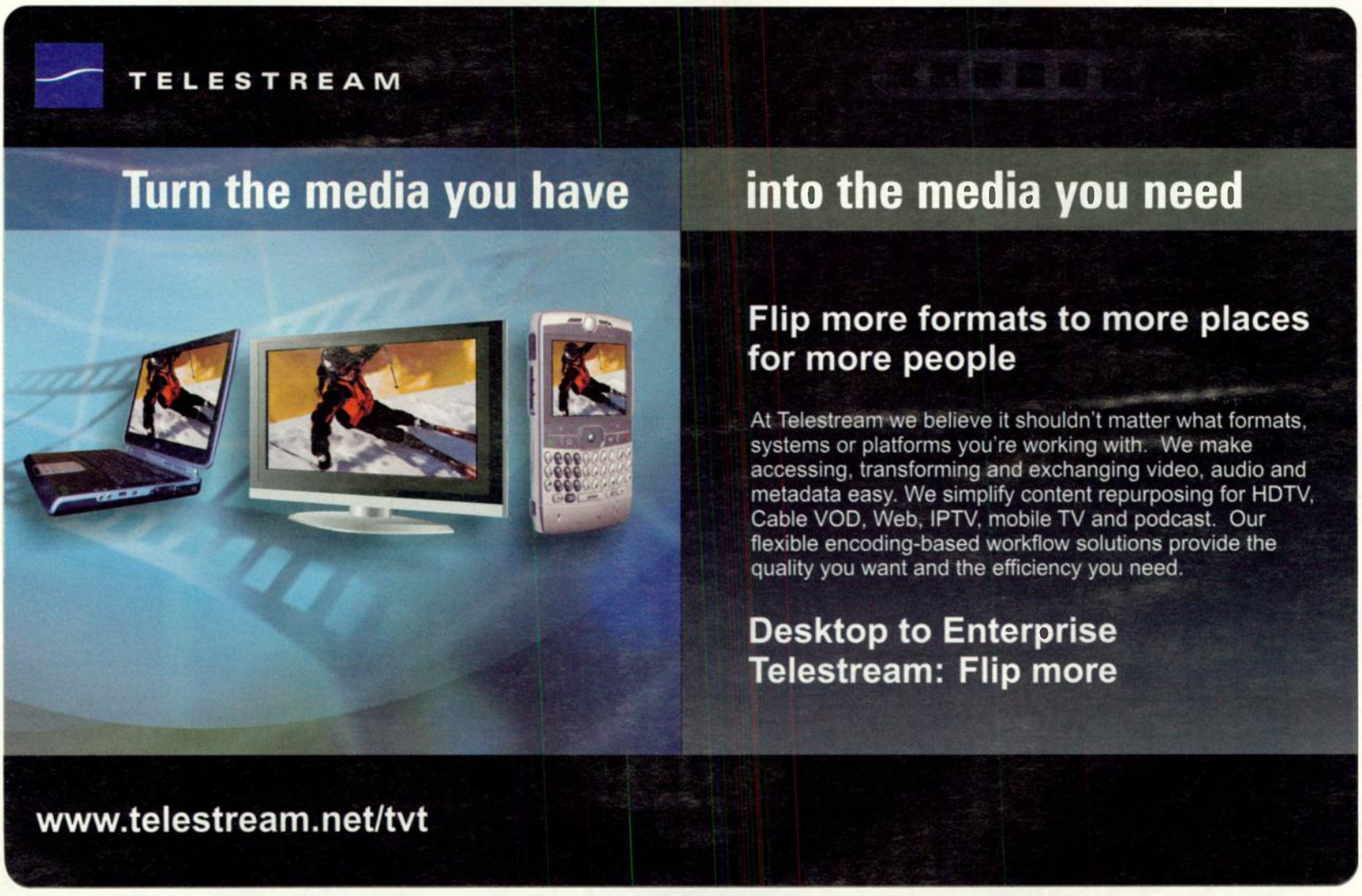
Poirer emphasized the advantages of the VC100's frame synchronization capability. "Not only can the product do different frame rates and formats," he said, "but still synchronize everything to your network or house reference."

The networks are not the only ones in need of format conversion; individual stations now need such signal processing, said Joe Zaller, vice president of marketing for Snell & Wilcox. "We see sources coming off fiber, off of a catch-server like a Pathfire, from ENG, analog and digital satellites, from the network or from your group."

He also pointed to video from the Web and from amateur videographers.

Snell & Wilcox developed the modular Quasar Ph.C for SD and HD signal conversion. It fits in a 3 RU IT modular system, with a complement of over 300 different cards designed for audio and video. "It really provides a complete solution for this digitization, moving from analog to digital to HD, and it's IT," Zaller said.

The Ph.C motion estimation technology can develop perfect progressive frames from pairs of interlaced fields, and develop frames in new time spaces when converting to different frame rates, for instance 50 fps to 60 fps. Converting between frame rates "is one of the hard-



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est things you can do in television," Zaller said, "because the output is in a different time-space than the input."

PROGRESSIVE PROCESSING

When Leitch acquired DPS several years ago, along with it came the DPS-575 Digital Processing Synchronizer, a standard definition signal converter. Leitch, since acquired by Harris, set about developing a high definition capable version, which became the X75.

"The idea was to have a box that would handle analog, digital, high definition in, and then provide all those signals out as well," said Randy Conrod, product manager for digital products, X75 Multiple Path Converter and Synchronizer, Leitch Business Unit of Harris Broadcast Communications Division. "And this platform has continued to grow."

Though 1080p60 was just a blip on the radar when the X75 was developed, the device's internal processing engines operate at 1080p60, using that as the intermediate step between 1080i and 720p, going in either direction. "We were going 1080p60 output a year ago," Conrod said.

Grass Valley has developed the GeckoFlex modular line, which handles a host of 8995 series modules that feature up-, down- and cross converter capability. The company has engineered new cards as customers have requested new capabilities.

"We have people who want to bring in multiple video sources to a single module," said Don Thomas, product marketing manager for Modular Products at Grass Valley. "So they will then be able to have the module run video in a side panel as well as video in the center or the center and left, or right, depending on how they want to divvy up their screen, but what they're basically doing is almost a mini mix effect."

Miranda JAZZ-800

Incoming news and program feeds are finding a growing need for signal conversion products, said Boromy Ung, product manager for interfacing at Miranda in Montreal. "You need to standardize the video format to what your plant is running." He has also seen the need for signal conversion products in the tie lines between routers in the same plant using different formats.

Miranda's modular signal conversion products include the XVP-1801 HD/SD Up/Down/Cross Converter, and standalone JAZZ-800 single or dual channel Universal Signal Processor.

Ung noted that for the dual channel model, "those two channels are independent, so you can have one channel working in 50 Hz, one channel working in 60 Hz. You can do two up-converts, two down-converts, one up and one down."

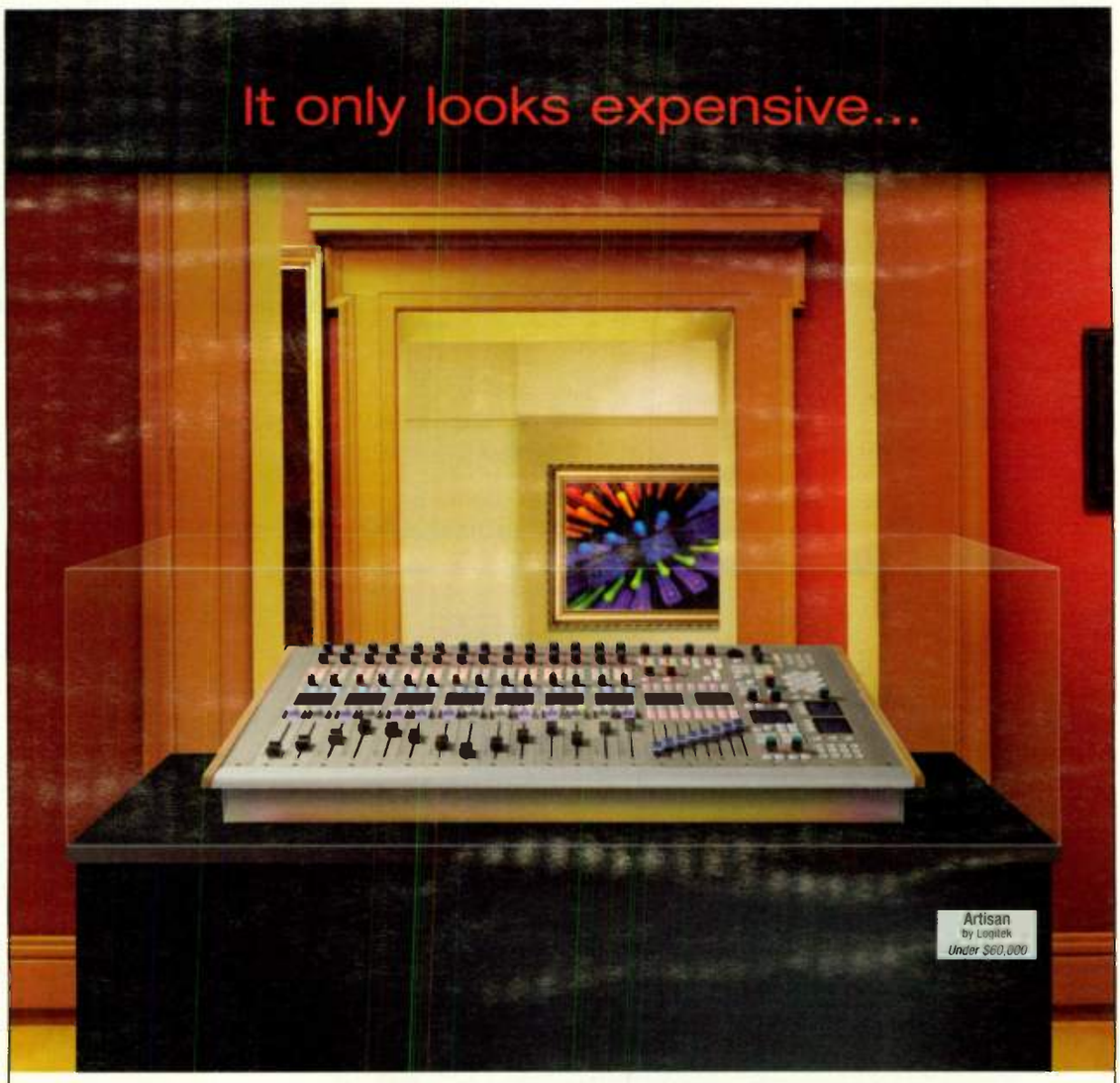
One application stations are now using the modular XVP-1801 for is substituting video for black in up-conversion side panels, Ung said. "Instead of having black sync panels when you upconvert it from 525, it can put in a different background and you don't have to go through a different device."

Orest Holyk, director of sales at Evertz in Burlington, Ontario, Canada, said he's seeing demand for their signal conversion units in mobile trucks.

"A truck can be built for HD production, and today that truck may pull up to a CBS event, and they're running at 1080i, and tomorrow they might do an ABC/ESPN event, and they're running 720p," Holyk said. "So in that particular case that truck would have to be ready to convert that 720p into 1080i if they're then repackaging that signal and offering it to a 1080i facility, or 720p to a 720p facility."

Evertz offers its modular 7710XC family of HD up-, down- and cross-converters, with four different cards to allow the customer to buy the capabilities needed without extras they won't be

TRANSLATION, PAGE 32



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Sporting a New Look

Live graphics are the MVP of sports broadcasts

by Claudia Kienzle

HAMILTON, N.J.

Sports broadcasters use live graphics to enhance the viewing experience by illustrating the status of game play, while reinforcing their distinctive channel branding. To pump up the look of their on-air product, they're increasingly producing graphics in HD; using striking, innovative 3D animations; and real-time, database-driven displays.

"We are hearing from both leagues and broadcasters about the need to better define what has occurred in a given play. Both feel this is an enhancement to the viewer, and may encourage growing viewership with a deeper understanding of the game and its plays," said Shaun Dail, vice president of sales and marketing for Orad Inc. in New York. "The ability to break down a fast-moving sport with visual analysis, as well as provide an understanding of what happened is very valuable.

"Also, as a global phenomenon, broadcasters are looking to capitalize on their graphics displays in order to complement and reinforce their unique channel branding and identity," Dail said. "They're trying to incorporate their logos, colors, and other distinctive icons to stand out; for example, during transitions to replays or in-and-out animations for score boards."

KNOWING THE SCORE

Orad's CyberSport, a live sports enhancement and virtual advertisement platform, uses image tracking technology to tie graphical objects keyed onto specific spots on the playing field. Since they remain in position regardless of how or where the cameras move, this creates the illusion that these graphical objects are an integral part of the event. The graphics can be ads, logos, bright lines marking off the field, flags at the start of race lanes, distances traveled, and statistics from real-time data sources.

According to Dail, "interfacing with databases allows easy management of large amounts of data. This is particularly important during athletics, skiing, or swimming events in which considerable numbers of athletes participate."

The starting lineup, powered by Chyron's Lyric Pro "Primitive Geometry"

Orad's CyberSport has been used by NBC to enhance many of the Olympic games the network has covered; as well as by Televisa for its 2006 World Cup soccer coverage from Germany.

Once considered a luxury reserved only for major sports networks and high-profile events, real-time data-driven graphics have now become a necessity for live sports. Having the ability take real-time data feeds from third-party sources and have that data automatically populate graphical, on-screen displays offers more complete and accurate information because it eliminates the need for a person to type in the data manually—which could introduce errors.

"The clock doesn't stop to wait for graphics, so real time is incredibly important," said Teicia Joffe, broadcast product marketing manager for Avid Technology in Tewksbury, Mass. "Interfacing real-time data to graphics templates used to be an innovation—but is now a requirement in order to deliver the most accurate information to viewers at home.

"Key creative trends in sports are stunning, high-impact visuals that both look great and deliver accurate, late-breaking scoring and results," Joffe said. "As you might expect in the world of sports, broadcasters are looking to be competitive and groundbreaking in their choice of a graphics look and system."

BETTING ON REAL-TIME

International Sound Corp., a longtime Avid customer in Baltimore, has 45 Avid Dekos—mostly Deko 1000s with a few Deko 550s—and plans to add two more units this summer. All of the Dekos are used to provide live graphics for closed-circuit television systems at 48 racetracks nationwide.

The graphics give the betting public critical tote (short for "totalisator") data, including odds on horses, money wagered, and pay outs, that they rely on for placing wagers. Tote data is provided as a real-time feed from three tote companies in the United States, each of which employs a different data protocol. International Sound developed a custom interface for the Dekos that handles the different Tote formats, then utilizes the Dekos real-time graphics capabilities to put that timely Tote data into aesthetic, informative graphics.

"The biggest reason we went with Deko is it handles real-time data displays accurately and reliably," said Joe Gordon, International Sound's director of communications and manager of the graphics systems. "We produce many live shows that run from four to six hours a day, five days a week, and if our graphics systems are not working dependably 100 percent of the time, we start getting phone calls in a second."

Gordon said that at the Kentucky Derby in May, Deko graphics were seen by over 155,000 spectators on-site, and wagering on that one event totaled $100 million. International Sound provided graphics to two of the three 2007 Triple Crown races: the Kentucky Derby; and the Preakness Stakes at Pimlico Race Course.

While sports networks occasionally take a camera feed from International Sound's production, they do not typically air the signals. However, occasionally, local broadcasters, such as WBFF Fox-45 in Baltimore run International Sound's Deko graphics to supplement their coverage of the races.

REAL TIME CHALLENGES

At Pixel Power Inc. in Burbank, Calif., CEO Pete Challinger agreed that broadcasters want to convey timely, visual information while effectively branding their channel and programming.

Also, the creative trend has shifted from just putting up some text and a few graphics, to becoming a full-screen, visual environment with persistent and dynamic information graphics, including the use of native HD 16:9, 3D ani-

SPORTING, PAGE 28

World Radio History

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World Radio History

Sporting

CONTINUED FROM PAGE 26

mation, and real-time streaming data texture mapped onto 3D objects.

"These days, people want to deliver a composite graphic that comes up with several layers of both static and animated graphics elements, full video backgrounds, DVE compressed and positioned video inserts, and audio elements that all work together to establish the total look," Challinger said.

"There is also rapidly increasing demand for database-driven templates and live insertion of externally provided streaming data coming in as RSS feeds. It all relates to maximizing the value of every inch of screen real estate," he said. "Where things like multiple tickers that are fed from real-time data feeds used to be unusual, now they are pretty much demanded by everyone."

Pixel Power's graphics products line includes the Clarity 3000, which has a single channel plus a live video preview channel; and the Clarity 5000, which is two full video channels with two video previews, ideal for evaluating complex graphics before they air. Pixel Power's HD/SD Clarity line also offers a CG-3D option for real-time 3D animation of elements, lighting, and moves; customized subtitling application; and automated data input from sports statistics systems.

VECTOR-BASED GRAPHICS

Bergen, Norway-based Vizrt designed its Viz|Trio graphics system to recall and play graphics to air quickly. The Viz|Trio controls one or more Viz/Engines—real-time graphics devices that can output graphics in any HD or SD format.

"This means that even though the Viz|Engine can play back clips and full raster video like a traditional graphics device, Vizrt has taken this a step further, constructing the Viz|Engine around Vector-based graphics. The Viz|Engine receives very small data commands to literally draw the graphics on the screen at that moment," said Tom Shelburne, director of special projects for Vizrt.

This allows graphics to be changed

International Sound uses 45 Avid Dekos to provide live graphics for closed-circuit television systems at 48 racetracks nationwide.

at any point, even with seconds to air. And high-resolution 3D HD images can be e-mailed to a remote truck because vector files are small data files. The Viz|Engine also has the ability to texture live video so that it can be mapped or wrapped around a sphere among other sophisticated effects. Since Vizrt graphics are vector-based, massive amounts of storage, rendering, and page recalls are not issues.

"Once graphics are taken to air, Vizrt has a unique way of handling vector-based graphics through something we call 'Transition Logic,'" Shelburne said. "We can have multiple graphic pages or templates that interact with each other on the screen. As information changes, Vizrt systems can look at what is on-air and appropriately fly-off the existing graphics, or the existing graphics will automatically make room for the new graphics."

GRAPHICS WORKFLOW

Chyron Corp. also supports vector-based graphics for a more efficient workflow. According to Lyric Product Manager Aldo Campisi, "Because file size and disk space requirements are much larger when dealing with HD production, we provide a solution which balances both hardware-based HD clip playback and vector-based elements, which can be modified, animated, and composited in real time, resulting in much smaller file sizes and transfers."

These files also give the designer creative freedom to craft in any external 3D application and import vector data and geometry directly into Lyric PRO via the FBX Importer. For example, Chyron adopted Autodesk's FBX Importer format to facilitate the integration of 3D elements—created using Autodesk 3D animation tools—into Lyric PRO, the companion to Chyron's Hyper X2 graphics system for graphics creation in HD/SD. In addition, Chyron's InterFuse technology supports a streamlined workflow by integrating all of its products into a flexible, scalable solution controlled by a single, user-friendly GUI.

"While our sports broadcaster clients are adopting HD to stand out and be recognized by their visual branding," Campisi said, "they are equally concerned with the workflow requirements necessary to attain and execute such creative and compelling real-time, 3D graphics."

Campisi also sees growing demand for template graphics.

"External data easily integrates into the Chyron workflow," Campisi said. "Chyron templates effortlessly harvest external data from various data sources, including SQL, XML, Excel, Access, HTML, RSS. Once the templates are 'data-bound,' sports statistics can be automatically fed directly onto surfaces of 3D objects."

UNOBTRUSIVE

While sports graphics are trending towards bursts of 3D HD information, real-time data and audio, Becky Posch, product line manager for Harris Inscriber G-Series said that graphics should quickly inform the viewers without interrupting the flow of the game.

Posch said that creative trends in sports graphics are the growing use of 16:9 HD and 3D animation. And the greatest technical challenges are concerns over upgrading GPUs, drives, and other hardware, with the insatiable need for more bandwidth and speed. Another key trend is the use of real-time 3D animation.

"Using 3D technology, the viewer feels more like they're 'in the game.' It gives a new perspective and kind of crosses over into the world of videogames. Typical cool uses are starting grids for car racing, flyovers of golf holes with text content, starting lineups and scoreboards with league updates, among others," Posch said.

For live sports graphics, Harris offers the Harris Inscriber G-Series, in conjunction with Harris Inscriber RTX. Also, the RTXports option is used to play out RTX applications on a G-Series system. So, any streaming data that can be fed into the system can be displayed on air as text or graphics in real time.

"For instance, you can connect an RTX system to the arena scoreboard at a football game, and then using a simple, custom application on your desktop, stream data from the scoreboard directly into your on-air broadcast," Posch said. "This content can be created and displayed as an HD 3D animation, which we call '3D Flyby.' This capability allows you to add dynamic data to your broadcast without requiring an extra CG operator because the process is fully automated."

STREAMING STATS

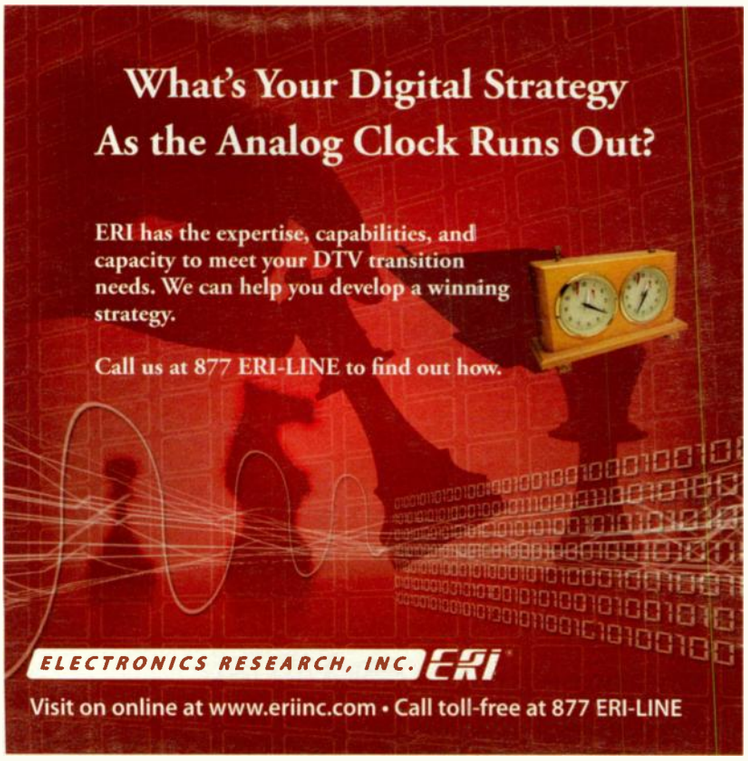
Eugene Plawutsky, product manager for graphics at Miranda Technologies, in Montreal, agrees that demand is growing for streaming data-driven displays.

"The key for the broadcaster is providing data to the viewer in organized, manageable chunks," Plawutsky said. "We have partnered with data providers, such as Stats Inc., for live data feeds, which stream data into our data management tools built into crawls, tickers, and templates," Plawutsky said.

The Xmedia Suite, Miranda's graphics creation and control suite, and the Vertigo XG HD/SD live graphics system, use a template-based workflow for faster graphics creation. The Xmedia Suite offers support for data integration and broadcast logic to facilitate the creation and recall of in-game statistics and other graphics.

Miranda's solution also can receive live information from GPS tracking technology, which Plawutsky said is another exciting and important development for sports graphics.

"Dynamic graphics are playing a large role in live coverage, providing [real-time] information, such as statistics, play recreation, and a constant update of the game score," Plawutsky said. "There is much more information available today during a sports broadcast than ever before, and the creative challenge is finding a way to present graphics in a timely and elegant fashion." ■



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HD Lenses For All

Lensmakers adapt to challenges of lower-cost gear

by Craig Johnston

SEATTLE

Camera makers had an advantage when they answered the call for lower-cost high-definition ENG video cameras: The incessant Moore's Law drop in price for processors and other electronic components needed to build those products.

Lens makers, who have been similarly challenged to lower the prices of their professional HD optical wares, have found their task more difficult. There has been no Moore's Law-like drop in the price of exotic glass, optical coatings and precision-machined mechanics of their lenses.

Nonetheless, lens makers knew that If they were going to sell into the market for lower cost HD cameras, they had to bring out lenses that fit in a lower price range.

"Each of [the manufacturers] would sit down with us and disclose what they were planning," said Larry Thorpe, Canon Broadcast & Communication Division national marketing executive. By knowing the characteristics of the new HD camcorders, the lens makers would know where they could make compromises that would have the least effect on the ultimate video image.

The Canon KJ10e, part of the company's lower-cost HDgc line of lenses.

Thorpe noted that a good example of this is the analog to digital processing spec on a camcorder. A faster processor can capture a greater dynamic range, and thus contrast, than a slower processor.

"What analog-to-digital conversion are you going to use?" said Thorpe. "10-bit? 12-bit? 14-bit? If they say 14-bit, we say 'whoa,' we've got to watch it on contrast. But if it's 10-bit, we can relax a little."

A range of other parameters also figure into the equation. In the imaging process, there is imager size and pixel count on the imager, which directly affects resolution. Getting to the recorder, there's the compression step.

"These guys are getting 4:4:4 from the camera, but they're making that into a 4:2:2, a 4:1:1, a 3:1:1 or a 2:1:1, then reducing the bits down to maybe an 8-bit depth on the recorder, and that affects contrast," Thorpe said.

The Fujinon HTs18x4.2BRM

Three companies supplying lenses to the ENG market have each taken a somewhat different approach to delivering lower cost lenses.

Canon has introduced an entire family of these types of economical ENG lenses, the HDgc family that includes 14 lenses.

The company has two tiers within the HDgc family. One that encompasses all of Canon's established operational innovations such as enhanced digital drive unit for zoom, focus, iris, and a 2x range extender; and a second, less expensive tier that excludes the extender system and replaces the e-Drive system with the Shuttle Shot drive unit.

Fujinon has two categories of lenses, but the difference between the two is not as noticeable.

"We make our H-series, which is our highest quality series, and our X-series, which is just under that," said Dave Waddell, Fujinon. marketing manager.

Fujinon does make two lenses with a sharply lower cost for the JVC 1/3-inch imager camcorders, but also makes an H-series lens for those camcorders.

To shave the price of their lower-cost lenses, both Canon and Fujinon have looked to lower cost optical glass and coatings.

"You could also say that the manufacturing process or the assembly process isn't as stringent," Waddell said.

But both companies emphasize the importance of the integrity of the lens mechanics. High definition demands precision positioning of the lens elements throughout the zoom and focus ranges, and ENG demands a ruggedness to match the rigors of day-in and day-out field use.

FEWER FEATURES

At present, Thales Angenieux has no plans to introduce lenses for the 1/2- or 1/3-inch imager camcorders, but does have an economical option for 2/3-inch camcorders in its HD-e line.

"We do not select lenses that are good enough for some HD cameras and not recommended for others," said Chris Beauparlant, the Americas sales manager for Thales Angenieux. "We simply try to reduce some of the features of the lenses that the operator many not effectively use in order to provide some cost savings," he said "This means that the lenses are exactly the same in terms of optics inside hence the same high level of HD performance. The HD-e line is essentially the HD line of lenses but without a 2x extender."

Though some of the lowest-priced lenses are made for the 1/3-inch camcorders, the fact of the matter is that

Thales Angenieux 19x HD-e

everything else being equal, it takes a better lens on a 1/3-inch imager camcorder to achieve the same image quality that could be had from a 2/3-inch imager camcorder.

"If everything was equal, you would need a better lens for 1/3-inch, because your pixel density would be higher, they would be packed in more closely," Waddell said. "Believe it or not, we're selling a lot of H-series lenses [for the 1/3-inch imager camcorders] simply because it looks so much better on the camera than the lower priced lenses."

Thorpe predicted that some broadcasters may retreat from the smaller imager camcorders. "I think there's going to be a marketplace floor established, where people are going to get some of these low-cost camcorders and shoot with them for a while and say, 'Now I see what I can and can't do compared to the old days when I shot with 2/3-inch,' and I think you'll see them going back to 2/3-inch for certain levels of news and production," he said. ■

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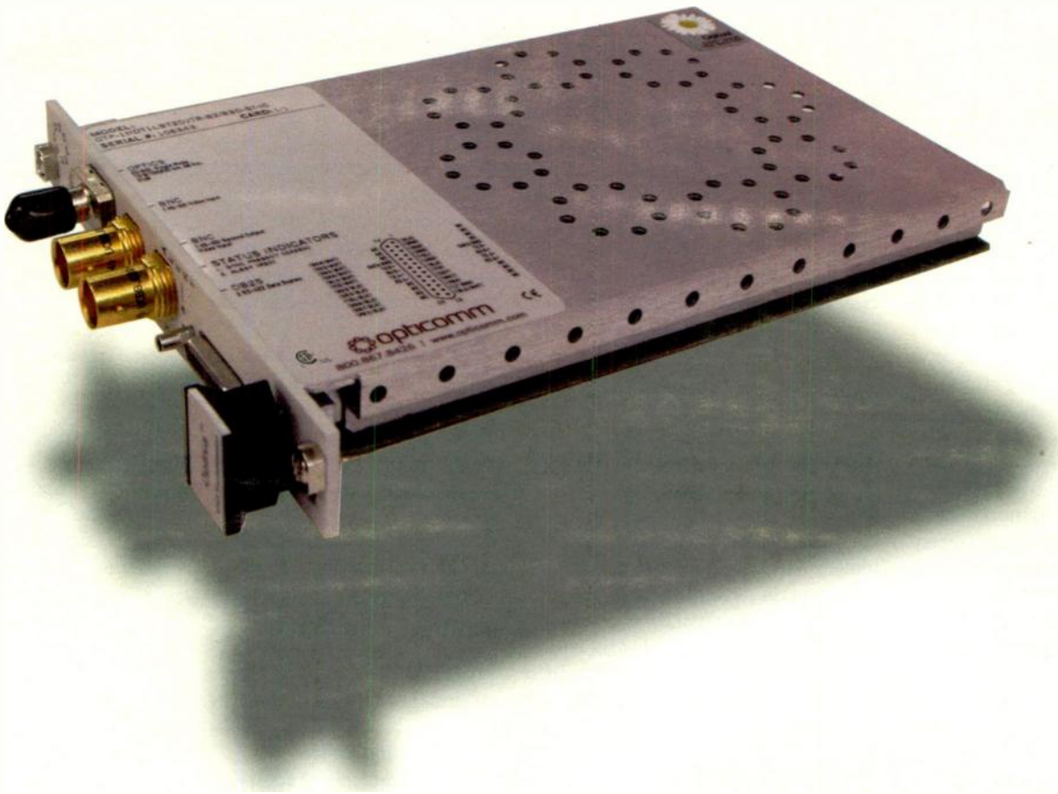

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Scripps Taps JVC for HD ENG

Deal marks significant broadcast endorsement for HDV

by Craig Johnston

WAYNE, N.J.

In the largest purchase so far of HDV camcorders for use in newsgathering by a U.S. station group, Scripps Television Station Group will receive more than 150 JVC GY-HD250 ProHD camcorders for their 10 stations.

To reach its decision, Scripps carried out an extensive, side-by-side shootout. "The test process was overseen by a select committee of engineers, news people and operators and managers," said Michael Doback, Scripps vice president of engineering. The decision came down to a number of factors, not the least of which was image quality.

"As part of our in-studio shootout comparison, we lined these cameras up with a $50,000 studio camera," he said. "The 250 performed incredibly well."

Doback said the Scripps stations had put cameras from several manufacturers into service in the field to evaluate workflow. "In the end, the workflow [of the other systems] didn't marry up as well with our expectations as we had hoped."

WORKFLOW NEEDS

As part of the purchase, Scripps bought more than 300 DR-HD10060G HD hard disk recorders and over 150 BR-HD50 ProHD recorder/players. Doback said they plan to simultaneously record on DV tape and hard drive.

"We can store essence in either format, on the hard drive or the DV tape, depending on which particular format the workflow requires, or if we need 100-percent redundant backup."

He pointed to the ability to access the encoded output of the JVC GY-HD250 camcorder for high-definition live shots, eliminating the need for a separate MPEG encoder, as a significant factor in Scripps' decision making.

Two physical anomalies of utilizing a 1/3-inch imager required special treatment. The first was the need for a high-quality HD lens. "We have found that with the smaller size imager the glass becomes critical in the quality of the image, and we chose to spend more money on the lenses."

Fujinon is developing a new high-quality HD ENG lens for 1/3-inch imagers, the HTS18x4.2BERM, which will include a 2x extender. Fujinon said the lens will begin shipping in October.

The second 1/3-inch imager issue was performance in low light. "A 2/3-inch image sensor has more sensitivity than a 1/3-inch," said Larry Librach, vice president of the Digital Video Division at JVC.

In response to the sensitivity issue, JVC has increased both the electrical gain and used their shutter to achieve more light accumulation. This added 30, 36 and 42 dB of video boost that Librach said offers comparable images to their competition. "The low-lux software will now be offered to all broadcasters who purchase our camera," he said.

The Scripps television group is a mixture of ABC and NBC affiliates, along with one independent. While the JVC 250's 720p acquisition format dovetails neatly with the ABC affiliate station standards, the Scripps' two NBC affiliates are 1080i houses.

Scripps is purchasing more than 150 JVC GY-HD250 ProHD camcorders

"We are looking at that workflow right now," said Doback. "There are compelling reasons for doing 720p newsgathering at our 1080i stations and then upconverting it at the front door. I would have no problem editing at 720, easier on the editors, easier on the storage, easier on the network."

Scripps already has two stations doing full high-definition newscasts using the JVC camcorders in the field, and two more that are doing selective liveshots in HD. ■

Translation

CONTINUED FROM PAGE 25

using. The cards fit into Evertz's standard, universal frame.

"So we actually do a conversion of CEA-608-B to CEA-708-B on the closed captioning side, so if you've got an SD closed caption and you need it converted to HD, you can do that as well."

Stations are not only finding the need to convert the format of running video, but entire video files as well. A pair of companies making that type of format conversion products are Telestream and Rhozet.

Telestream's FlipFactory family of products has found a home in broadcast stations with specific FlipFactory products for news and the traffic department.

"One of the things that broadcasters use FlipFactory for is to ingest commercials from commercial delivery services like Vyvx and DG FastChannel, and get them into the broadcast server, notify automation, kind of automate that whole ingest of commercials," said David Heppe, president of Telestream in Nevada City, Calif.

He noted that differences among brands of broadcast servers has complicated this process.

"Each of the broadcast server companies treats the ANSI data a little bit differently, so we're having to kind of map the metadata in blanking a little bit differently, specifically for each broadcast server manufacturer," he said.

Telestream has just introduced its Pipeline video format converter, which is a standard definition product.

Dave Trescot, CEO of Rhozet, pointed to the great variety of file types at a typical production facility. "They have, in their environment, multiple types of servers, SD and HD, multiple types of editing systems," he said, "and they need to be able to move the data around without being worried about 'oh, this editor can't be used with this playout server, or this camera system captured something that our editor hasn't been updated yet to be able to take.'"

Rhozet's Carbon Coder file conversion software runs under Microsoft Windows XP Professional or Server 2003. It can run as a standalone unit, or be controlled by the company's Carbon Server, which can control a rendering farm of multiple Carbon Coders.

Carbon Server "allows you to treat multiple Carbon Coders as though they were one Carbon Coder," Trescot said. "And you don't care what jobs come to it, because you automatically get load balancing, and you automatically get failover, so if one node goes down, it doesn't matter because the others will keep transcoding."

It might seem that as analog television broadcasting sunsets in 2009, the signal conversion business would subside. Grass Valley's Thomas relayed the sentiments of his fellow manufacturers when he said, "I envision an engineering team working on conversion modules for the foreseeable future, only because these conversion modules will be doing more and more things." ■

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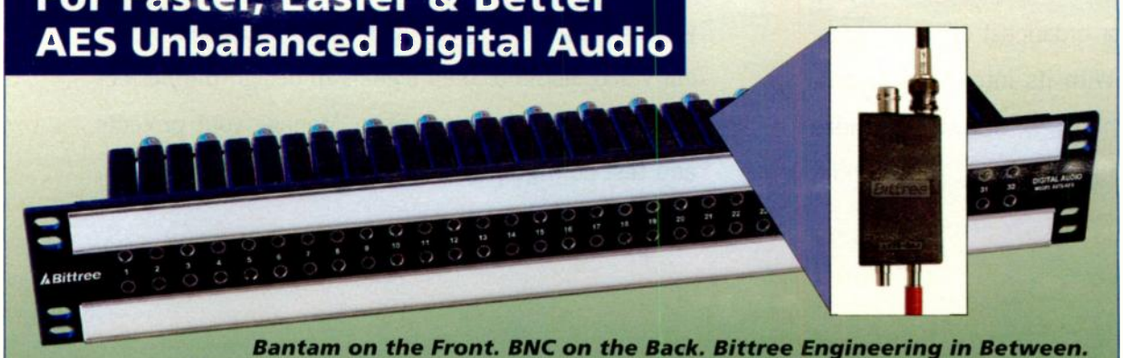

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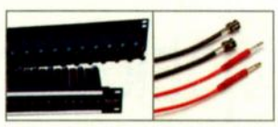

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World Radio History

Cable

CONTINUED FROM PAGE 1

iation, only 250,000 CableCARDs in use, and plenty of blame to go around for the sluggish adoption rate. The cable industry at one point blamed consumer electronics makers for turning out defective CableCARD interfaces. The consumer electronics industry said cable operators were discouraging the deployment of CableCARDs through a variety of stunts. It wasn't unusual for the folks in service departments to have never heard of CableCARDs. Cable technicians were said to be sent on calls armed with inferior software.

Whatever the case, the plug-and-play agreement disintegrated into bickering and the integration ban deadline kept getting delayed—from January 2005 to July 2006 then to the current date. In the meantime, the cable industry fixed its focus on newer technology that would allow interactive, two-way features not available with current CableCARD TVs. The cable lobby last August sought one more (preferably indefinite) postponement, but the FCC boiled it down to "no dice."

Brian Dietz is vice president of communications for the National Cable and Telecommunications Association, which represents cable operators serving 90 percent of the market. He said the industry has accepted the inevitability of "707," the idiom for the July 1, 2007 deadline, but that cable subscribers will suffer for it.

"The integration ban doesn't require set-tops to be sold at retail," Dietz said. "It just requires cable companies to separate the security."

As a result, he said, scads of set-tops won't suddenly appear on retail shelves come July. Indeed, the two biggest set-top makers for the U.S. market—Scientific Atlanta (which shipped 1.8 million set-tops worldwide last quarter) and Motorola in Schaumburg, Ill.—have no immediate plans to go into the retail market, according to Clark and Paul Alfieri of Motorola. That does not preclude them from doing so down the road. One third-party player, TiVo, has entered the market with a $700 multiple-stream CableCARD digital video recorder, but for now, cable operators will likely remain the dominant source for consumer set-tops.

Cable operators, in turn, will have to recoup some of the higher cost of the nonintegrated boxes or face a pounding on Wall Street over increased capitol expenditures.

Ian Olgeirson of Kagan said, "in general, operators are faced with spending between $40 and $50 more for each digital box—the CableCARD plus the additional cost in the box of accommodating the card."

At the same time, cable is capped on what it can charge for equipment, so the set-top business is not the industry cash cow it's commonly perceived to be, Dietz said. The cap on set-top leases is around 11 percent over cost amortized over the life of the box, he said. The new boxes are expected to lease for $2 to $3 more than current models.

"The ban will essentially be a tax on cable customers," Dietz said.

Will the integration ban mean more CableCARD-enabled set top boxes on the market? Don't count on it yet, say manufacturers.

The NCTA estimates that the integration ban will cost in the neighborhood of $600 million—the average number of new set-tops deployed each year—8 million—times the estimated $75 cost of CableCARD-compliant set-tops.

THEN AGAIN...

Consumer electronics manufacturers and retailers are over the arguments against the integration ban. Jason Oxman, CEA vice president of communications, said when cable operators are required to deploy CableCARD-compliant set-tops, they'll be motivated to make CableCARDs work properly. Once that happens, the retail market for cable set-top boxes will materialize, he said.

"The key here is that manufacturers are looking to build equipment for a competitive marketplace; retailers are looking to sell equipment in a competitive cable marketplace, and more importantly, consumers want to buy equipment in a competitive cable marketplace," Oxman said.

He said the assertion about the integration ban costing $600 million is disingenuous.

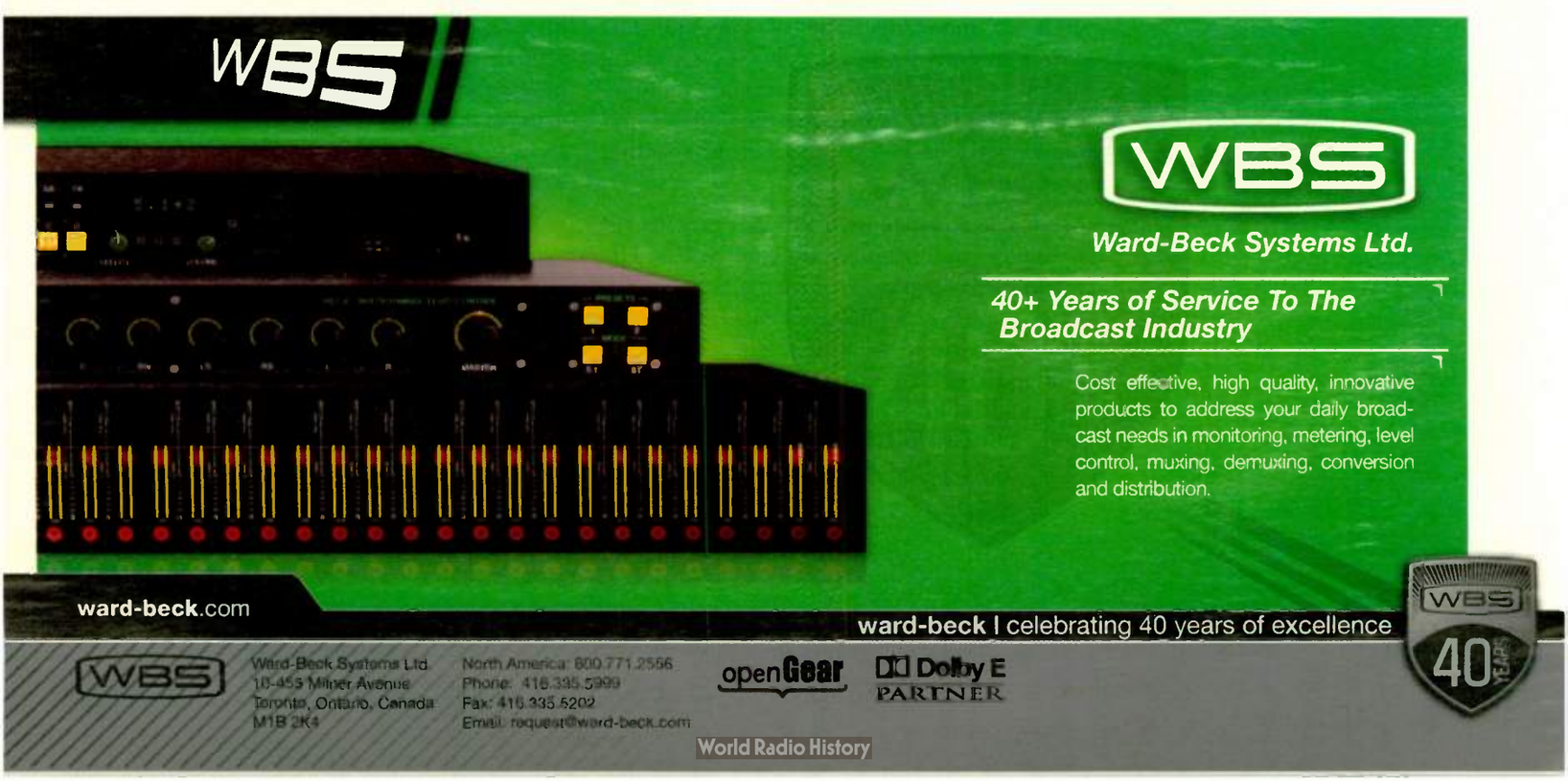
"The argument that development of a competitive cable equipment market will result in a higher price for consumers is completely antithetical to the commonly accepted principles of economics," he said.

The integration ban comes at a time when the cable industry has plenty of other fish to fry. Subscriber numbers have dropped in the past few years under pressure from satellite TV, from over 70 million to 65 million today. That market pressure is only expected to increase as Verizon and AT&T roll out their own television offerings.

For years, the cable industry's competitive strategy has involved incentives like video-on-demand, pay-per-view, interactive program guides and the like. Such features are not achievable without two-way technology, so it behooved the cable industry to delay the integration ban until a two-way agreement could be reached. However, since content copyright is a part of that equation, parties involved said negotiations are much more complicated than those resulting in plug-and-play.

As 707 approaches, the traditional course of events would indicate a lawsuit from the cable industry, but Dietz said he was not aware of one in the works. There are still several waiver requests from various cable providers pending with the FCC, which will be dealt with according to efforts under way at each of those concerns, an FCC spokesman said. For the most part, the integration ban is finally expected to become a reality July 1.

"We've been shipping separate security set-tops since May 1," Clark said. "The boat has left the dock." ■



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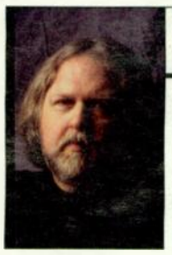


NET SOUP | Frank Beacham

The Hidden Cost Of Being 'Connected'

As I waited in an airport recently, a baby cried. Reacting, the mother reached into a carry bag, pulled out a portable DVD player and placed the motion-filled video screen a few inches from the infant's face. Within seconds, the "mediated" baby became quiet.

Few others noticed, mainly because they were preoccupied with their own laptops, mobile phones, iPods or BlackBerry e-mail devices. Most of the connected travelers in that airport were disconnected from the real life going on around them.

In 2007, we are a culture obsessed with portable media gadgets. A celebratory motto of the 1933 World's Fair in Chicago accurately predicted our future. "Science Finds, Industry Applies, Man Conforms," the slogan proclaimed to a generation intoxicated with the promise of technological "progress."

WHO COULD IT BE?

Yet, now that 24/7 connectivity is a major ingredient in our daily lives, I suspect we made a high-tech bargain with the devil. All this personal information technology was supposed to empower the individual and provide us with greater freedom. Often it seems the opposite is true.

If there ever was a signature moment of these times, it came during 10 remarkable hours last April 18. That was the great BlackBerry Blackout of 2007—a day when more than 5 million Blackberry users found themselves cut off from instant communication.

So many Americans are hooked on the constant flow of BlackBerry messages that the blackout made international headlines. From White House operations to neighborhood fast food delivery, the impact was far and wide.

For many BlackBerry users, however, the outage wasn't just an inconvenience, but a clear demonstration of just how emotionally dependent they had become to the connected life. A lot of people didn't like the changes they saw within themselves.

A report from The New York Times cited tale after tale of BlackBerry withdrawal panic, noting that "symptoms include feelings of isolation, a strong temptation to lash out at company IT workers, and severe longing, not unlike drug withdrawal."

One BlackBerry user described what he called "jonesing," the sensation of imagined physical vibrations from his inexplicably silent device. "I have reached the point where I get phantom vibrations, even when I'm not carrying the thing," he told a Times reporter. "That sure doesn't sound too healthy, does it?"

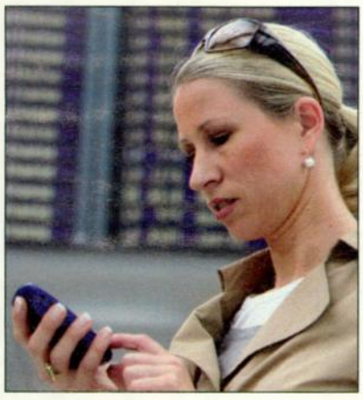
Nope, it doesn't. Yet, with the next wave of video-centric mobile technology now being deployed, I wonder if we've even begun to experience the cultural impact of being on an interactive electronic leash.

This wireless revolution began some time ago. With the exploding popularity of pocket pagers and mobile phones in the 1980s and '90s, the once clear delineation between personal and work time was erased for many workers.

Being always available was sold as a sign of "productivity" and equated with financial success. Remember those AT&T commercials that pictured the mobile worker taking business calls on the beach or at a golf course? Connectivity was directly associated with personal freedom.

But, as many mobile workers soon learned, the opposite is true.

If there ever was a signature moment of these times, it came during 10 remarkable hours last April 18. That was the great BlackBerry Blackout of 2007—a day when more than 5 million BlackBerry users found themselves cut off from instant communication.



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Those who answer work-related calls at any time on their mobile phone are signaling to others that they are open for business at all times. Not knowing how to say "no" to such off-hour intrusions invites stress and disturbances into personal and family time.

The next big thing, if mobile carriers have their way, is to extend on-demand interactive video-centric media to the portable connected device. At this early stage, most of us haven't begun to con-

COST, PAGE 38

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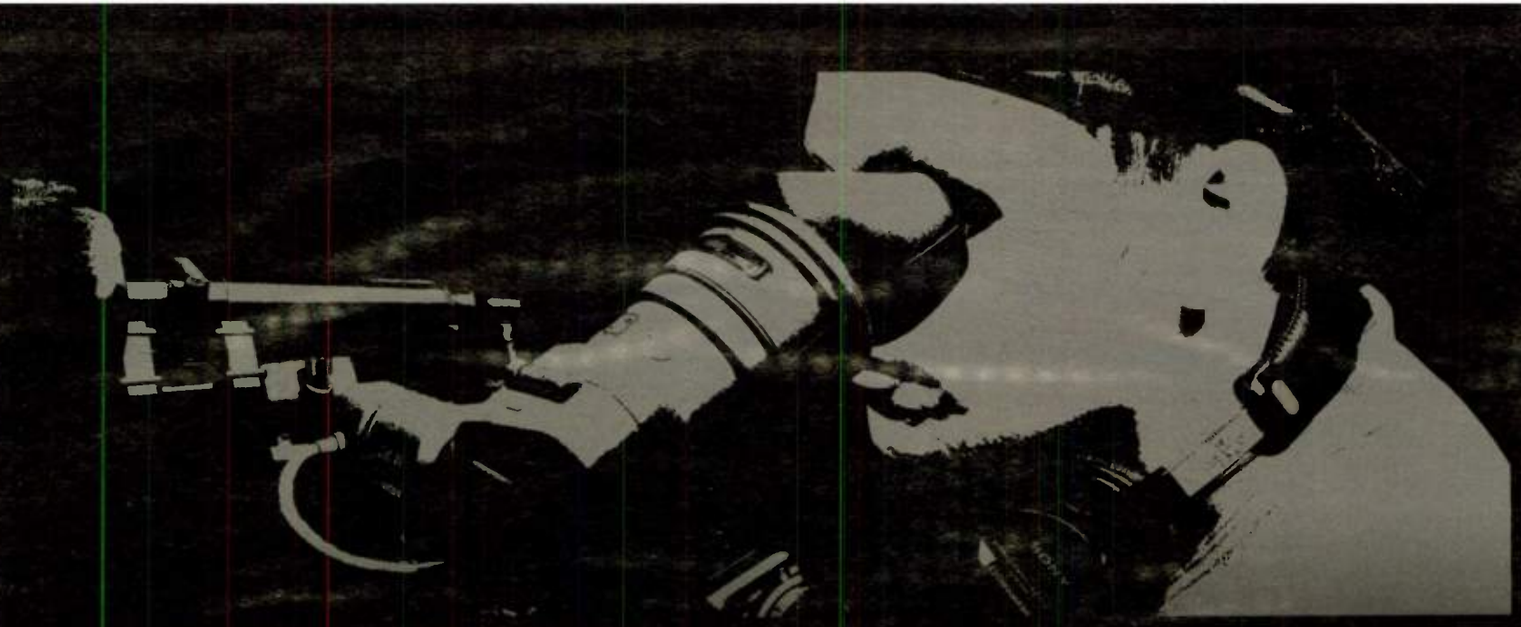

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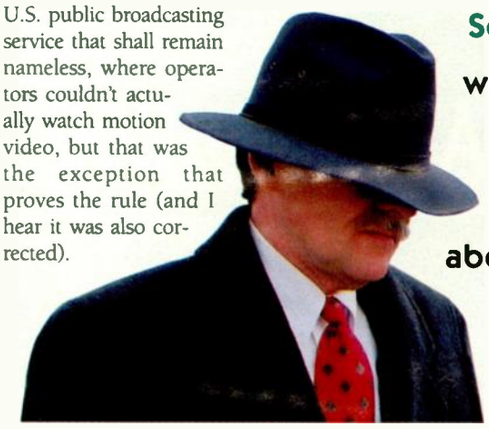
THE MASKED ENGINEER | Mario Orazio

TV Is Pictures and Sound; 'Taint Numbers and Specs

You might not have noticed that all television control rooms have monitors of both the picture and sound variety. Okay, so there was one recent abomination, at a U.S. public broadcasting service that shall remain nameless, where operators couldn't actually watch motion video, but that was the exception that proves the rule (and I hear it was also corrected).



This ain't about the dynamic range, color gamut, and motion rendition of CRTs versus other displays, and it ain't about comparative audio transducers. It's more basic.

There's a good reason for all those monitors. You're supposed to look at and listen to them.

Some days I feel like a wild-eyed revolutionary when I suggest that what's important about the TV technology business is pictures and sound.

Some days I feel like a wild-eyed revolutionary when I suggest that what's important about the TV technology business is pictures and sound. Methinks that in this digital age I'm supposed to be in love with numbers.

Now then, there's a word worth a moment's thought. Pronounce the "b" in numbers, and you're talking about digits, figures and their relatives. Don't pronounce the "b," and you're talking about stuff that dulls the senses, like, for instance, the aforementioned digits and figures.

Okay, I'll grant you that some numbers are important. If you don't fit your U.S. broadcast into 6 MHz, you won't keep your license for long. If your sound carrier ain't 4.5 MHz above your picture carrier, no one can hear you scream. But those numbers ain't got anything to do with the picture and sound monitors in control rooms.

DIALNORM DISPUTE

Our Beloved Commish, aka the FCC, says that if you broadcast digital TV you've got to transmit a number called "dialnorm" that correlates to the program loudness. Most broadcasters seem to be at least trying to figure out how to deal with that (loudness not being something we've enumerated in the past), but this time a certain Columbia broadcasting system that shall remain nameless is the exception that proves the rule.

They say dialnorm doesn't work. Ulysses S. Grant once said the best way to get rid of a bad law is to enforce it. The nameless network thinks a better way is to ignore it.

Anyhow, that's a policy dispute. Methinks the bigger problem is numbers substituting for quality.

Back in the good old days that lasted from 1941 to around 1997, there was basically one flavor of TV in the U.S. By the numbers, it had 525 total scanning lines per frame and 30 interlaced frames per second (29.97 when color came in). I could throw in more numbers, but I don't want to numb you.

Now then, the fact that there was one flavor of TV surely doesn't mean there was only one level of quality. In a taste test, you can tell differences between different brands of vanilla ice cream, and you've probably got a favorite. It was the same with 525-line TV. There were differences between cameras, recorders, and monitors, and if you were around back then, you probably had a favorite.

To do a "taste test," you lined up

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Cost

CONTINUED FROM PAGE 36

sider the implications of such potentially powerful technology.

The battle for our "ear time"—long ago won by Apple's iPod—now shifts to "eye time," where corporate marketers will try to fill our every waking second with some kind of video imagery—whether it be live sports, soap operas, movies, or commercials in the back seat of taxi cabs.

Since we don't teach media literacy in American schools, I wonder how that baby in the airport—soothed with seductive television images from birth—will process the difference between genuine, real world experiences and what is designed to manipulate behavior.

FEELING VERY SLEEPY...

It's scary, because we Americans aren't particularly discriminating—we accept new technology very easily. Wireless media devices are presented as hip, sexy and glamorous—a way to stay in touch with friends and what's happening.

Of course, many of these devices offer legitimate convenience and even a level of safety for some. That's where it all gets confusing, separating the true benefits from what's frivolous and distracting. Unfortunately, moderation in such matters is not part of the equation in our "supersize me" culture.

We are always given good reasons to go along. Since we're assured that technology makes our daily lives easier and more fun, we find easy justification to buy in. Why not accept it, use it, and go with the flow?

Because history has taught us that new technologies are always a double-edged sword. For all the good a new technology brings, we lose something with its adoption. All initial emphasis is on the benefits. During the sales pitch, the negative effects are hidden.

Only after the technology becomes embedded in our daily lives do we begin to understand the tradeoffs we made in embracing it. Many BlackBerry users learned that lesson during the great blackout.

As we embrace on-demand media and communications devices that connect us around the clock, perhaps we should consider what we are giving up in the transaction. There are always winners and losers. The trick is notto come out a loser.

Frank Beacham is an independent writers and media producer based in New York City.

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TV Broadcast and Satellite

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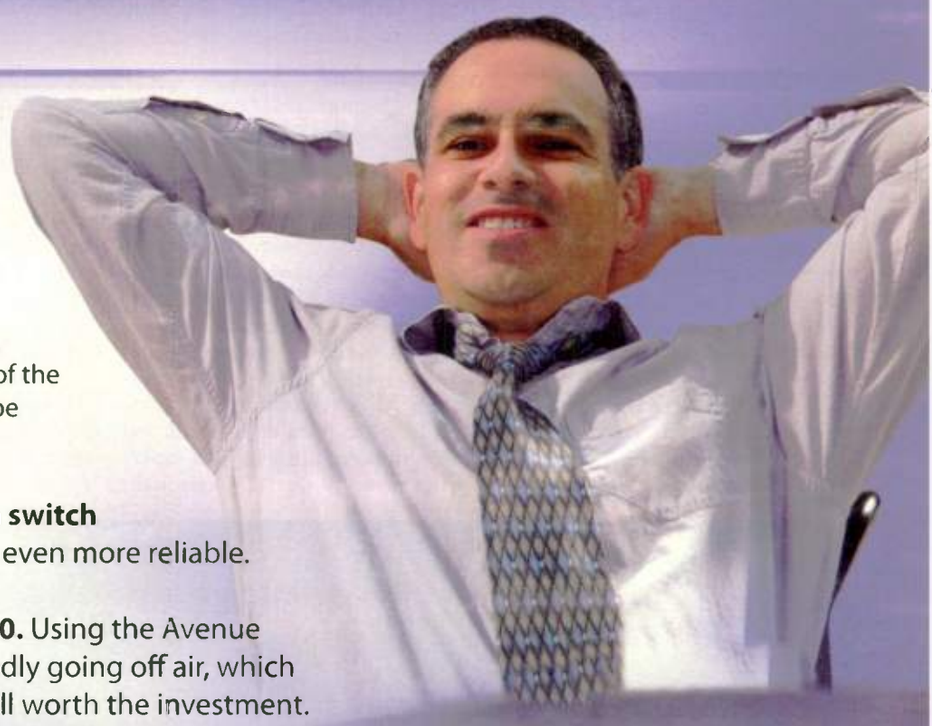

You can use the **sophisticated detection system** to your advantage by adjusting the switch's parameters for *your* facility's needs. For example, the black detection system allows you to set both the threshold and the percentage of non-black pixels. But that's not all, you can also determine the portion of the picture to be considered. This allows a corner bug to be either included or excluded in the detection process.

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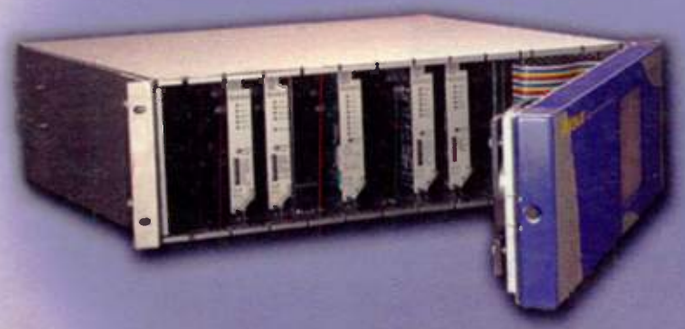

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AUDIO BY DESIGN | Mary C. Gruszka

5.1 Audio for HD: YES Case Study, Part I

When designing and building an HD facility, the video part can be relatively simple compared to audio.

With 5.1 audio, there are so many permutations. Embedded or not? Discrete or multiplexed/compressed? Besides the six surround channels, discrete or derived stereo may be needed. And what kind of stereo—left only/right only or left total/right total?

What about other downmixes for monitoring? And don't forget the SAP channel or channels, mono, stereo or 5.1.

If using embedded audio, do all recording, routing and processing devices support it? And how many channels do they support? Is the embedded audio disturbed during any of the video processes? There will likely be locations like the audio control room where de-embedders will be needed to extract the discrete audio channels.

And don't forget the metadata and lip-sync timing with the video.

NO MONO NO MORE

Going back to mono isn't an option, and organizations facing these kinds of audio issues for their HD facilities have developed solutions to meet their unique operating and technical requirements. From time to time, "Audio by Design" will share some of these mini case studies.

This month, we'll start with the Yankees Entertainment & Sports, or YES Network, which recently completed a new HD production and master control facility in Stamford, Conn.

> "Audio was and remains the biggest problem we have."
>
> —John McKenna, YES

YES Network master control

According to YES Chief Engineer John McKenna, "audio was and remains the biggest problem we have."

McKenna said all audio at the YES Broadcast Center is embedded because there's only one level on the Nvision

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Pictures

CONTINUED FROM PAGE 38

the cameras, shot a scene, and looked at a monitor. The one that made the pictures you liked most was your winner. It was just that simple.

After you bought your cameras, you still looked at monitors. That's how you could tell such stuff as whether the tubes suffered from beam starvation (tubes were glass cylinders that...; oh, never mind). If there's a branch of our business that still values picture monitors, it's video operators and colorists. They work by pictures, not numbers.

If a camera's gamma is supposed to be .45, why do operating panels include gamma controls? The idea is to make good-looking pictures (or a particular kind of bad looking picture), not to match numbers.

Here's another number: +4 dBu. That's a common audio program operating level. You can crank up a mic preamp to the point of distortion and then turn down the level on a mixer's input channel so that VU-meter peaks hit +4 dBu. Does it sound good? Repeat after me: Distortion is bad. Video ops and colorists look at pictures; audio mixers listen to sounds.

Today we've got more flavors of TV. There is 1080-active-line HDTV and 720-active-line HDTV. There is mono, stereo, and 5.1-channel surround sound. In other words, there are numbers.

So, what's better: 1080i or 720p? Whoops! I forgot that it ain't polite to discuss religious beliefs. Let me try again. What's better: 1080i or 525-line TV? If you go by the numbers, there ain't any contest. Both are interlaced, so we can put that tenet of faith to rest. One's got a lot more lines than the other.

So let me make the question a little more interesting. What's better: a $1,000 1080i camcorder/lens combo or a $60,000 525-line version? Are you pausing to think? How about if I make the choice between a broken $1,000 1080i camcorder and a perfectly maintained and set up $60,000 525-line version?

Think you know the answer now? I don't. I'd want to look at the pictures from each—and listen to the sound on playback. Maybe the way the 1080i camcorder is broken doesn't matter. Maybe there's a ton of light, so sensitivity is not an issue. Maybe small-format depth of field is a good idea in this case. I don't know, and neither do you.

There's a new tiny camcorder with built-in surround-sound capture. Is that a good thing? Are you sure? Have you listened? Are your pictures red? Is that because the camera settings are off, or is the lighting red? Is it red intentionally? Does your sound seem hollow? Quick, what number represents hollow? THD? Insertion gain? IMD? SNR? Methinks you ain't going to find one, but you can identify a hollow sound pretty quickly by listening.

Okay, that's enough preamble. Here comes the constitution in its entirety: If it looks and sounds good, it is good. If it looks and sounds bad, it is bad.

Forget numbers.

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

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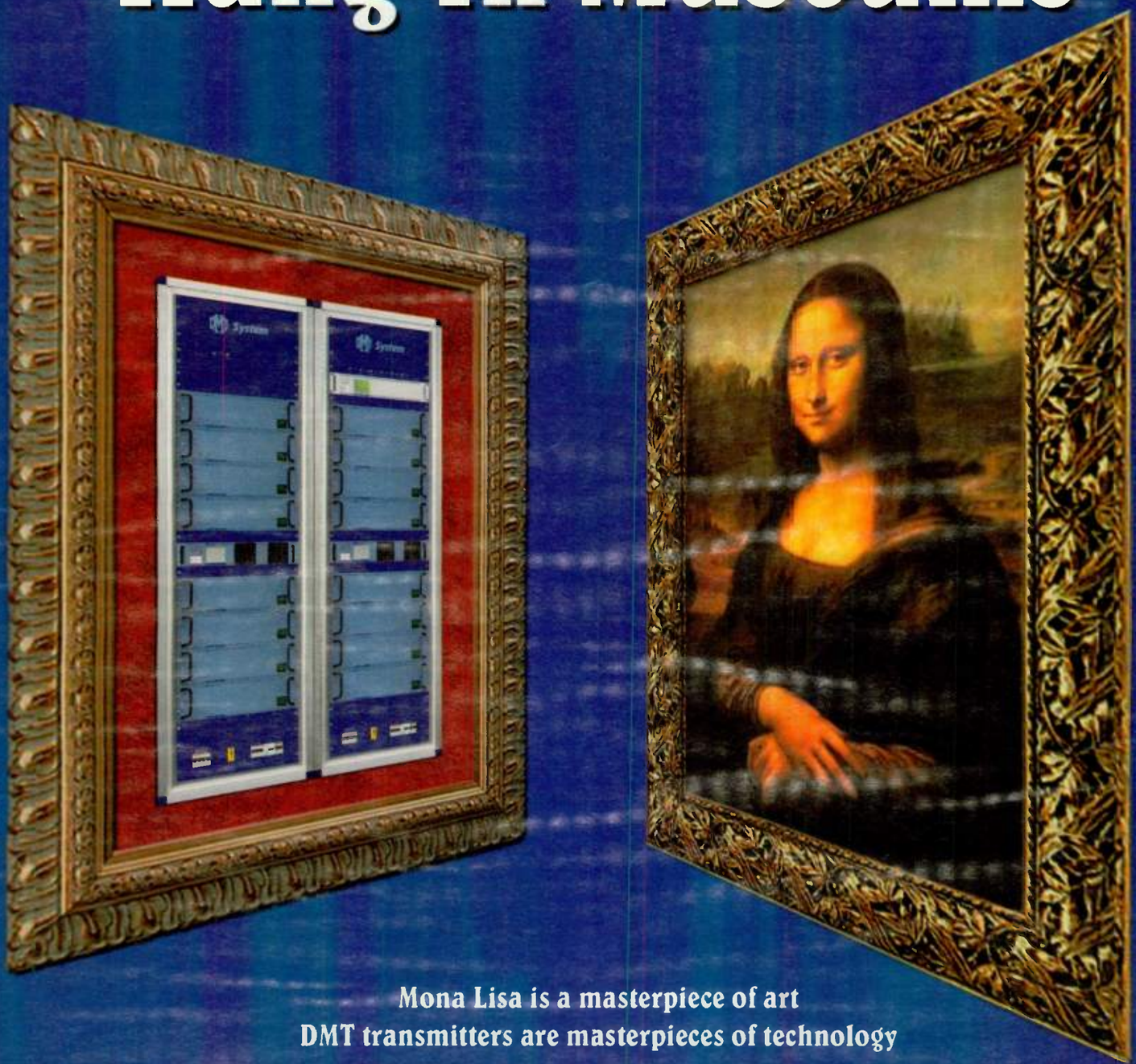

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YES

CONTINUED FROM PAGE 40

NV5128 HD digital production router. Not only that, YES uses Dolby E on one of the embedded AES channels to distribute 5.1, where available, within the new facility. The Nvision NV5128 can switch embedded Dolby E without loss of audio or pop and clicks, according to Chuck Diehl, northeast account manager for Nvision.

MASTER CONTROL PATH

Since the New York Yankees baseball games play such a major part of YES Network's broadcast schedule, let's start with the audio signal from Yankee Stadium in the Bronx.

YES employs Dolby E for its 5.1 audio feeds from Yankee Stadium in the Bronx to the YES Broadcast Center in Stamford. The stadium feed is actually an ASI feed decoded in Stamford through a Harris LinkPlus.

Dolby E channel assignments for the stadium feed are as follows:

- AES1/2—stadium front left and right;
- AES3/4—stadium center/low frequency effects (LFE);
- AES5/6—stadium rear left and right;
- AES7/8—stadium natural sound left and right.

Stadium center is the announcer/commentator dialog channel.

YES Network's Dolby control center

The signal from the game is fed to both master control and the production control room at the YES Broadcast Center in Stamford.

This month we'll concentrate on the master control audio path.

One copy of the inbound Dolby E stream is fed into a Dolby DP 572 decoder and turned into its three component AES 5.1 channels, which are then fed into a Dolby DP 563 ProLogic encoder to generate Lt/Rt (left total/right total), according to McKenna. The fourth channel, natural sound from the game, is recovered and distributed via a separate AES stream where needed around the plant. A copy of the 5.1 discrete components are used in production.

The Lt/Rt output from the Dolby DP 563 is then fed into the AES-1 input of a Harris Leitch MXA-3901 audio multiplexer where it is re-embedded into the HD-SDI video.

(Each AES channel contains two audio channels, and AES designations are indicated on the connector panel of each piece of gear. Some companies may label the first AES input as AES-1, while others may use AES-1/2.)

A copy of the Lt/Rt signal is also fed to destinations requiring a stereo signal, for example, the history recordings for Major League Baseball.

BACK TO THE GAME

Now back to the other inputs of the MXA-3901 audio embedder. The incoming Dolby E stream is fed to the AES-2 input and the Spanish radio game call (SAP, or secondary audio program) is placed on AES-3. This is how the HD video from the game is married to its embedded audio so that it can be switched by the Harris Leitch Opus-HD master control switcher.

SD programs and commercials are upconverted to HD before hitting the production HD routing switcher and master control switcher. In addition, all audio associated with video is embedded into the HD video signal. Not all sources contain Dolby E data as one of the AES channels of the embedded audio stream, for example those that are stereo only. Dolby E is used for remotes and YES HD studio 5.1 productions.

The master control switcher is fed some audio-only sources as well, such as voice-over or music for the slide/character generator.

All master control switching is performed on the embedded HD inputs, producing an embedded HD output.

This output of the master control switcher feeds a Harris Leitch LogoMotion and EEG closed caption encoders, and the resulting HD-SDI embedded signal is fed into a Harris Leitch DXM-3901 audio de-embedder (demultiplexer) where the AES-1 (Lt/Rt), AES-2 (Dolby E) and AES-3 (SAP) channels are recovered.

The video is fed directly into the Motorola DigiCipher II broadcast encoder, but audio takes a less direct route.

The AES-1 and AES-2 audio outputs from the DMX-3901 audio de-embedder are fed into the PCM and main inputs of another Dolby DP 572 Dolby E decoder and post-master control. The decoder produces the three component AES 5.1 channels from the output of the master control switcher.

Why is an Lt/Rt signal fed into the PCM input of the post-master control Dolby E decoder?

When the Dolby E decoder detects a Dolby E signal on the main input, the Dolby E signal is decoded into discrete 5.1 channel audio on three AES pairs.

If a Dolby E signal is not present on the main input, then the DP 572 decoder automatically switches to the PCM input (Lt/Rt) and sends this out on the AES-1/2 output.

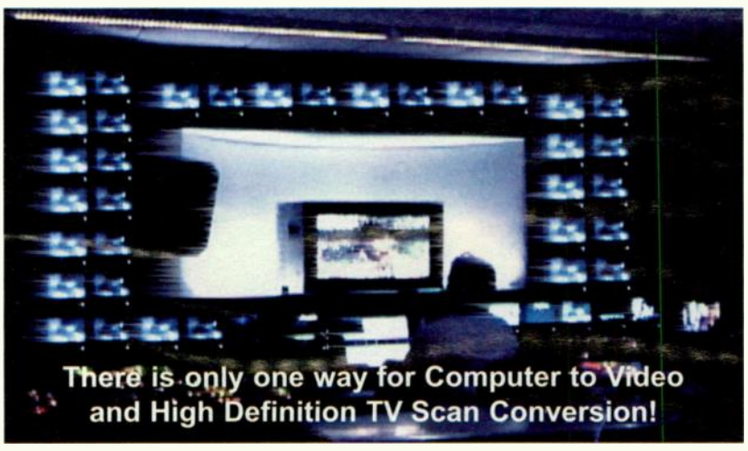
McKenna noted that when the DP 572 switches to the PCM (Lt/Rt), input it tells the DP 569 (AC-3 encoder), via the metadata ribbon cable interconnection, that it should switch to the Lt/Rt mode and modify the metadata in the AC-3 stream to tell the home receivers that it's now a stereo, not surround, signal.

As McKenna put it, "this scheme allows relatively automatic switching between 'E' and stereo but can cause a glitch if the master control room operator accidentally dissolves rather than cuts."

From the post-master control Dolby E decoder, the three discrete AES 5.1 signals are then passed through a Norpak NAVEII (Nielsen) encoder to a Dolby DP 569 AC-3 encoder. The output of the AC-3 encoder is the audio that is ultimately sent to the Motorola DigiCipher II broadcast encoder, where it is married and timed to the HD video. This DigiCipher II encoded feed is the one that is distributed to the YES Network HD affiliates.

Next time we'll see how YES handles the SAP channel and metadata.

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



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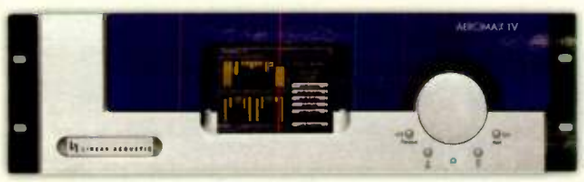

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World Radio History

INSIDE BROADBAND | Will Workman

Broadband Benefits From TV Ad Dollars

It's only a mere $9 billion. Based on various news reports, that's roughly what advertisers will spend on broadcast TV in the upcoming season beginning this fall, with no increase over the current season.

For years, they've been spending that money knowing only how many and what type of viewers are watching the shows around their commercials. The premise for this payment has grown increasingly tenuous with the evolution of avoidance technologies, from VCRs and remote controls to DVRs and Web viewing, allowing viewers to skip ads.

That's changing radically, with significant implications for broadband video distribution.

WHO'S WATCHING?

For the first time as of May 31, TV and ad executives knew how many viewers were watching commercials. Nielsen Media Research, which holds the monopoly on ratings data, expanded its reporting to note average *commercial-minute*, rather than program-minute.

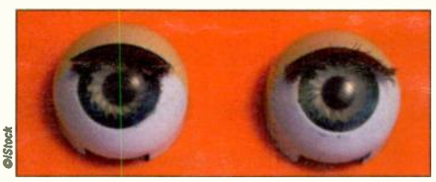
Nielsen took a peek at this before in trials beginning in 2005, finding that primetime network shows lose around 10 percent of viewers during commercial breaks; cable shows about 6 percent, and some younger-skewing networks like MTV, up to 20 percent.

Many executives say the new ratings data, combined with the continued migration of viewing to online and time-shifted platforms, heralds the industry's most significant change in 50 years.

This shift comes at a critical time for advertisers and networks. Each year in May at the annual upfront ritual, TV networks line up to entice ad buyers with previews of new shows, arming themselves with Nielsen ratings data sliced any which way to demonstrate the appeal of their programming. Up until last year, they had even been able to persuade ad executives to pay *more* per viewer, on the premise that broadcast TV is the last mass medium.

No longer.

Not only have network TV ratings and ad sales been flat, but advertisers are showing an increasing inclination to follow eyeballs to other venues, especially the Web, prompting a flurry of strategies and counter-strategies.



Advertisers are showing an increasing inclination to follow eyeballs to other venues, especially the Web, prompting a flurry of strategies and counter-strategies.

DVRs, a primary means for cable and satellite operators to grow revenues, have been marketed heavily, and are having the most significant impact on TV's shaky business model.

Almost one in five U.S. households had DVRs at the end of last year, a figure expected to rise to 30 percent by the end of 2007 and as high as 50 percent by 2010, according to Forrester Research.

ADDING CATEGORIES

Nielsen will be adding audience measurement categories, including one that will tally viewers who watch a program up to a week later. Not that that's any good for an advertiser with a time-sensitive message.

Research by the Syndicated Network Television Association shows that only 62 percent of 18- to 49-year-olds who watch DVR-recorded programs do so on the same day those air. How many of those watch the commercials will now be revealed—and with DVR ad-skipping, that's bound to be low.

Broadband-only shows, meanwhile, have been getting boosts from TV competitors.

Time Warner's AOL, for example, in April unleashed its own upfront programming schedule—a slate of five new shows, from "iLand," allowing contestants to live on and someday own a tropical island, to a second season of its popular "Gold Rush" game show, deliberately targeting TV ad dollars.

AOL executives are emphasizing that they can deliver an audience reach that's the equivalent of broadcast, but with the kind of interactivity and tailored targeting unmatched by regular TV.

Forrester researchers estimate that broadcasters are already charging a premium of 20 percent more for ads airing on Web-based shows as opposed to those only on broadcast, a trend that should accelerate.

Networks, of course, are doing their damnedest to take the "regular" out of TV, trying a number of creative approaches to integrate advertising in a less obtrusive way, and these go far beyond simple product placement.

First, every major broadcast show now has a significant online component—or several. In addition, many ads are now coming in shorter and shorter segments to allow for content "wraps," in which ads air interspersed with programming. Finally, branded content platforms, in which a particular brand provides a framework for a show or segment, have become commonplace. (You can see a half dozen of these on ESPN, for example.)

Plus the networks have aggressively organized their online offerings to integrate ad sales more effectively with traditional on-air spots.

COUNTERSTROKES

CBS, for example, has lumped its online extensions into a new Interactive Audience Network. Fox is touting its MySpace platform for ad integration (which I'm certain would thrill MySpace users). NBC has even talked about launching a real Bonfire magazine based on the fictional one that's the focus of its on-air drama, "Lipstick Jungle," to which it has dedicated space on NBC.com and iVillage.

The fledgling CW Network, meanwhile, has taken the most radical step, airing a full 30-minute "CW Now" entertainment "news" show sans ads, instead wrapping all kinds of commercials in content clothing.

How will viewers react to the ad-saturation of programs they watch? How adept will they become at stripping ads from their viewing? How much will advertisers reject traditional media platforms and move to more unconventional approaches? We're about to see.

Will Workman is a former editor of telco industry publications Cable World and MediaView. He is now working on his Ph.D. in mass communications. He can be reached care of TV Technology.

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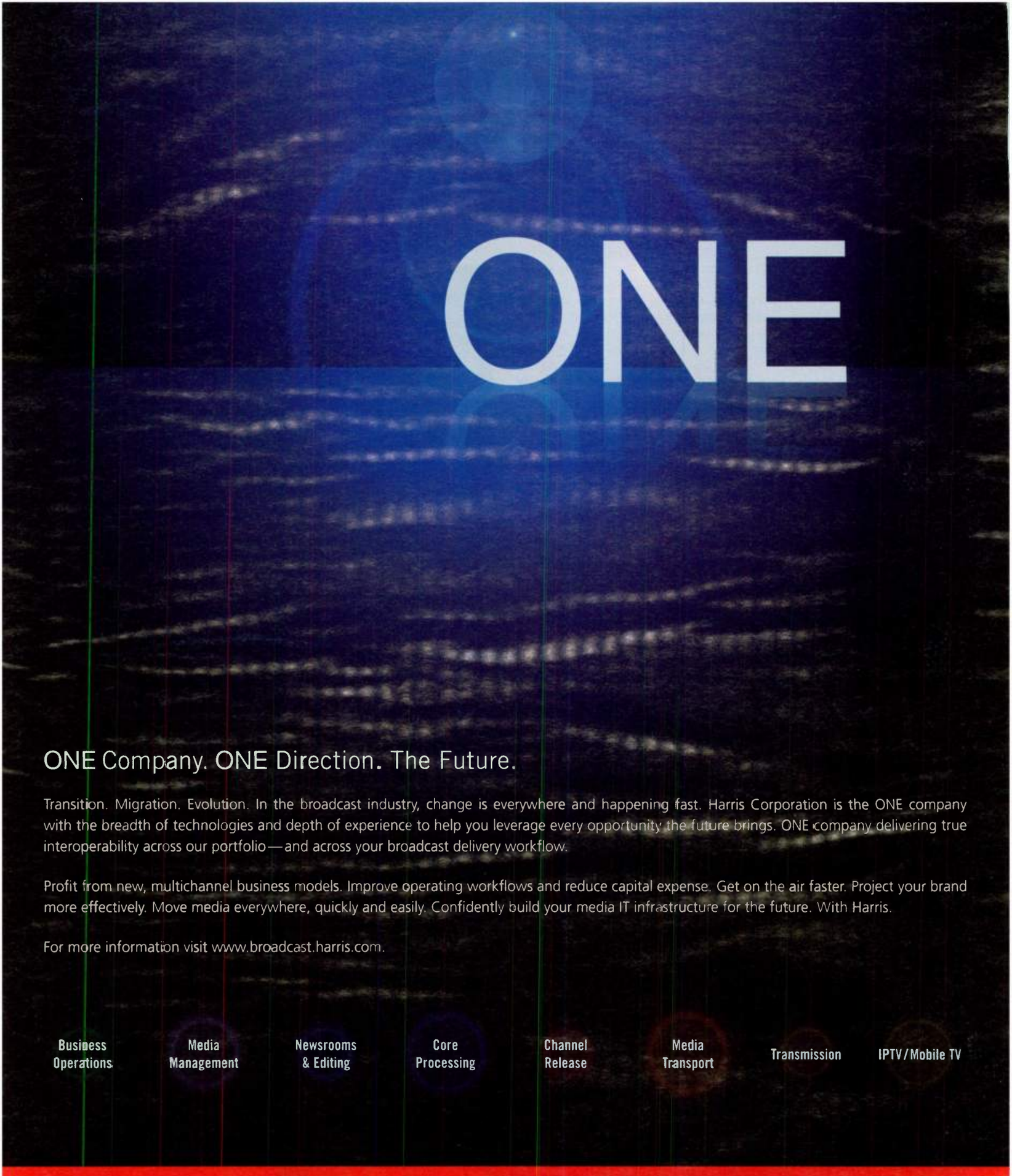

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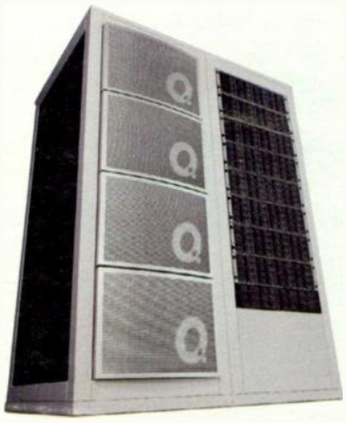
FOCUS ON EDITING | Jay Ankeney

Genetic Engineering Rewrites the DI Code

When Quantel named their awesome new post-production technology "Genetic Engineering" it raised some eyebrows. Then when they claimed it would "rewrite the DNA of post production," some said Quantel had to be kidding.

Well they are not, although it takes a bit of a journey to understand the implications of Quantel's impressive innovation. But it's a trip worth taking because according to its first adopter, FotoKem in Burbank, Calif., Genetic Engineering has the potential of changing the face of the highest end of post.

Genetic Engineering is a shared storage system that allows up to three Quantel workstations—such as their iQ online editing application, Pablo color grading system and Max assist station—to share the same storage workspace, dubbed "GenePool." A new product called "Sam" provides read/write access to the media stored in GenePool, but that's only the beginning.

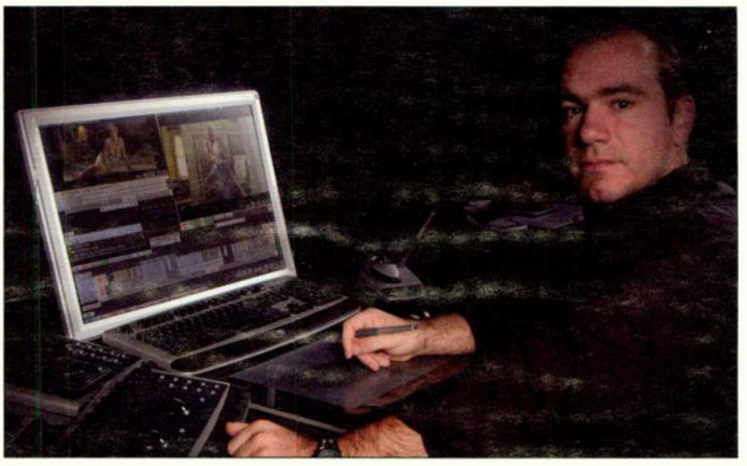


Quantel Genetic Engineering

What really becomes stunning is that Sam uses a common Internet filing system to let third-party applications running either Linux or Windows XP/Vista also access media in the shared pool. Since no special application programming interface (API) is required, third-party applications are fooled into thinking they have all the capabilities of the Genetic Engineering system's storage, throughput and team-working infrastructure.

As a result, Quantel demonstrated at NAB Genetic Engineering playing out three, 4K streams simultaneously. Two were running through Quantel iQ workstations, but the third was being controlled by eyeon Software's Fusion that was actually running on a common PC.

At the same time, an Arri scanner was inputting film-resolution material directly into the GenePool storage and MTI Film's Correct-DRS was tackling dust-busting work on DPX files. That's a tremendous amount of workload for even something called "Genetic Engineering" to handle.



FotoKem DI colorist Walter Volpatto at the iQ controls

The key is that each system thought it was controlling the media within Genetic Engineering when in reality it was the other way around. Genetic Engineering had fooled other systems into thinking they were working within their own local storage. No duplicate new media was ever being created and there was no degradation of overall performance despite the massive throughput. Thanks to Genetic Engineering's fiber-channel topology, each mainframe has access to the same disk bandwidth as it would have had with direct attached storage.

Are you starting to understand what makes Genetic Engineering so intriguing?

As Bill Schultz, senior vice president and general manager of digital film services at FotoKem explained, "When we use MTI Correct to remove dust on DPX files, the MTI machine thinks it is accessing those files locally while they are actually still within the shared storage architecture of the iQ part of Genetic Engineering. It's very, very clever."

ÜBER SHARING

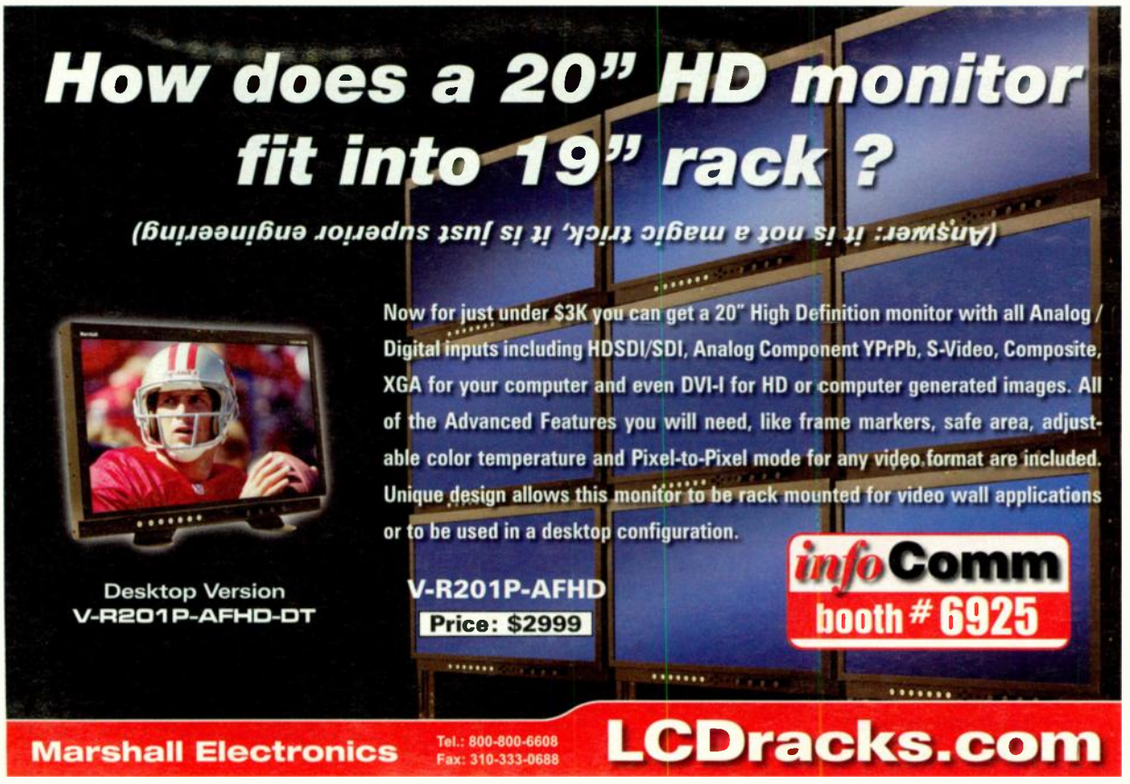
This greatly streamlines the digital intermediate (DI) and movie trailer creation process at FotoKem because if each application involved in the chain were getting its own copies of 2K or 4K files, the storage requirements would be huge. The data transportation bottlenecks would also be daunting.

Of course, the resulting data transpotation bottlenecks would also be daunting. But Genetic Engineering's Sam control module, or gateway, can play out up to several hundred megabytes per second, while the GenePool outputs three 4K streams simultaneously (each approximately 1 Gbps) for a total of 3 Gbps. In addition, Sam can provide enough additional bandwidth for film scanners and dust busters to work on the GenePool at the same time even though they alone may demand 70 to 100 MBps of data bandwidth.

"Because all of the storage is shared, any of the applications can use up to the entire system's capacity," Schultz said. "So where I would previously have had four separate chunks of 12 terabytes of storage, Genetic Engineering lets me utilize one giant pile of 48 terabytes that everything on the system can see at the same time."

This rabbit did not pull itself out of a hat. Genetic Engineering is the result of Quantel's unique investigation into the rising problems of creating digital intermediates.

"We wanted to design something that appeared to be like a SAN but was designed for the specific requirements of



World Radio History

DI work," said Mark Horton, product marketing manager at Quantel. "We added to it 'media virtualization' that presents all of the stored video in a common RGB color space. That way, a clip containing media from Digital Betacam [SD 4:2:2] and from film [2K 4:4:4] can look to the outside world as if it was all HD RGB in DPX files. Although no new media has actually been created, the Sam controller's purpose-built hardware lets each third-party application access the media in the format it needs without having to explicitly manage file conversion. The clip has been virtualized just by modifying an associated XML file."

That's why a third-party application that can natively handle only standard-definition video can be conned into thinking it is playing back HD 4:4:4 files when working through Genetic Engineering. The original footage has been virtualized on the fly without caching or rendering, and can be made available to any system a DI house or broadcaster wants to use.

"Genetic Engineering lets me utilize one giant pile of 48 terabytes that everything on the system can see at the same time."

—Bill Schultz, FotoKem

WHAT DESCARTES SAID

The material on the Quantel disks is accessed through a bit of wizardry they call FrameMagic and then played out in multiple streams even up to 4K with a patent-pending, disk-handling technology dubbed "Heuristic Precuing."

Yes, our British friends at Quantel are still speaking the Queen's English because "heuristic" (from the Greek "heurisko," or "I find") is a concept popularized by mathematician George Pólya relating to learning or problem solving through stimulative experimentation. Genetic Engineering thinks, therefore it is.

Perhaps most surprisingly, Quantel is letting any manufacturer use their Genetic Engineering technology without any special licensing fees. As noted above, there is no proprietary API source code needed to interface with it.

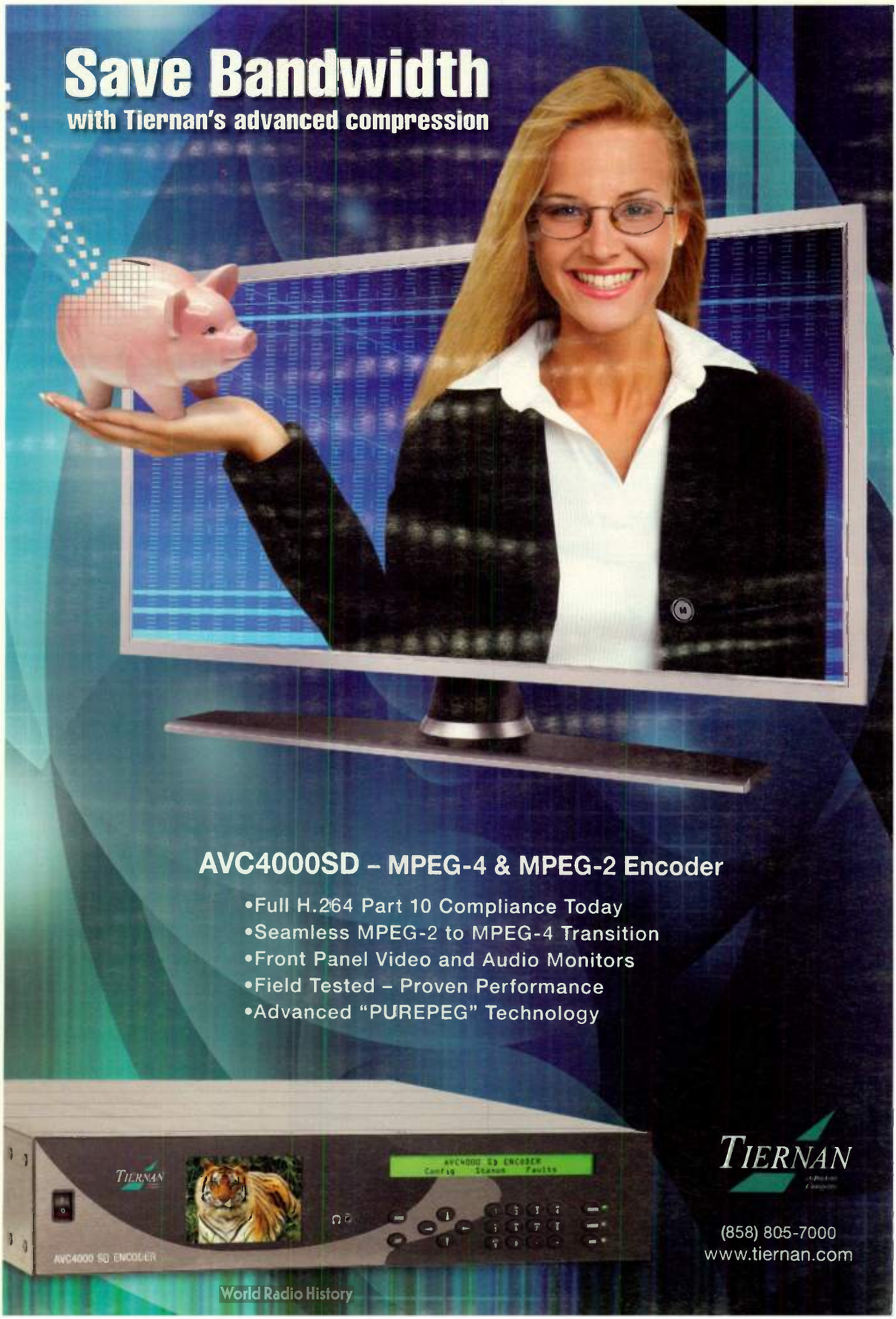
"Our way of looking at things is that people need the central workspace problem solved and that is what they are willing to pay money for," Horton said. "But they don't appreciate having to ask for permission to do it. Quantel's value comes from providing the workflow, not from selling licensing agreements to get at it."

Quantel predicts this technology will spread to effects specialists, post houses, broadcasters' creative services departments and anyone interested in collaborative workflow.

Even FotoKem doesn't want to keep Genetic Engineering all to themselves.

"Because Genetic Engineering is such a radical change from the way we were working before, we have only begun to touch what the system is able to do," FotoKem's Schultz said. "However, we look forward to other facilities getting their hands on this technology too. After all, high-end facilities need new capabilities to differentiate themselves from the rapidly increasing power of desktop post production and Genetic Engineering is one more technology that provides a marketplace advantage."

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



DIGITAL TV | Charles W. Rhodes

FCC Report Reveals More Potential Interference

There appears to be a great euphoria among broadcasters over telecasting to pedestrians and moving vehicles with the new technologies demonstrated at NAB2007. I wouldn't want to upset this mood, but that development may have been overtaken by events I should brief my readers about.

This month, I will report on test results by the FCC Laboratory on interference rejection of modern consumer DTV receivers. Unanticipated interference to DTV reception was discovered and reported in FCC Office of Engineering and Technology document 07-TR-1003 dated March 30.

Interference due to tuner overload was worse at a moderate desired (D) signal power (–53 dBm) than under strong D signal power (–28 dBm). It was even worse at lower D levels such as (–68 dBm).

This report suggests that the RF automatic gain control circuits in modern receivers may have had enough pre-detection bandwidth that strong undesired (U) signals caused the RF amplifier gain to be reduced so the mixer was less subject to overloading.

Interference due to tuner overload was a problem in the past only where a receiver was near the U signal transmitter. That particular problem has been resolved, but the area of such interference is now farther out—at and beyond the D = –53 dBm contour, all the way to the noise-limited contour of –84 dBm. Fixing this problem would be much more difficult than improving RF automatic gain control.

MORE SURPRISES

Interference to a D signal on channel n was worse when the U signal was on n+/–2 than if on n+/–1. This was unanticipated, and the report attributed it to the wideband RF automatic gain control, which these modern receivers appear to have.

Some receivers were found susceptible to interference due to a signal on channel n+7. This too was unanticipated. I believe this interference mechanism is novel to DTV receivers. A signal on channel n+7 can affect the carrier recovery circuits of DTV receivers because it looks like single sideband noise, which increases the phase noise of the local oscillator. There are no restrictions on D/U ratios for n+7 or any other UHF taboo channel to protect from DTV-DTV interference.

Interference due to tuner overload was worse at a moderate desired signal power than under strong signal power.

The FCC Laboratory tested each receiver to find out whether the tuner was a single or double conversion. All were found to have single-conversion tuners, while the FCC based its protection factors on the measured interference rejection of the double-conversion tuner in the prototype DTV receiver tested at the Advanced Television Technology Center in 1995.

This is a glaring disconnect between consumer receiver interference rejection and that of the prototype tested in 1995. Because FCC Part 73 rules are based on that double-conversion tuner prototype, there are no D/U ratios for DTV-DTV interference. I interpret this to mean that when unlicensed transmitters are permitted to share broadcast TV spectrum, they cannot cause harmful interference if they avoid using DTV channels (n) and also avoid using the first adjacent channels n+/–1.

Harmful interference, as I understand the term, is due to U signals stronger than D signals by a margin larger that the FCC D/U ratio for that set of channel relationships.

The FCC Labs also found that interference from two undesired signals on n+k and n+2k where k is an integer up to at least +/–8, can cause interfere with channel n. However, because these U signals must be on what in the analog world were called "taboo channels," such interference cannot be considered harmful because it results from third-order intermodulation products (IM3) generated in the afflicted receiver.

In other words, the interference can be blamed on poor receiver design. Furthermore it is not harmful because no FCC rule has been violated.

This is another new and unanticipated form of interference. It will become chronic when unlicensed transmitters become popular. They will become available to the public within 21 months or even less.

The FCC report noted: "Pairs of undesired signals placed on channels n+k and n+2k, where k is a positive or negative integer create an opportunity for third-order intermodulation occurring in the DTV tuner to create spectral products that fall in the desired channel n. We had anticipated paired-signal effects would be significant only at high signal levels; however, detailed measurements on one DTV receiver (chapter 11) demonstrated that such effects can constitute a dominant interference susceptibility, even at desired signal levels very near the minimum signal threshold for the TV, when such signal pairs exist."

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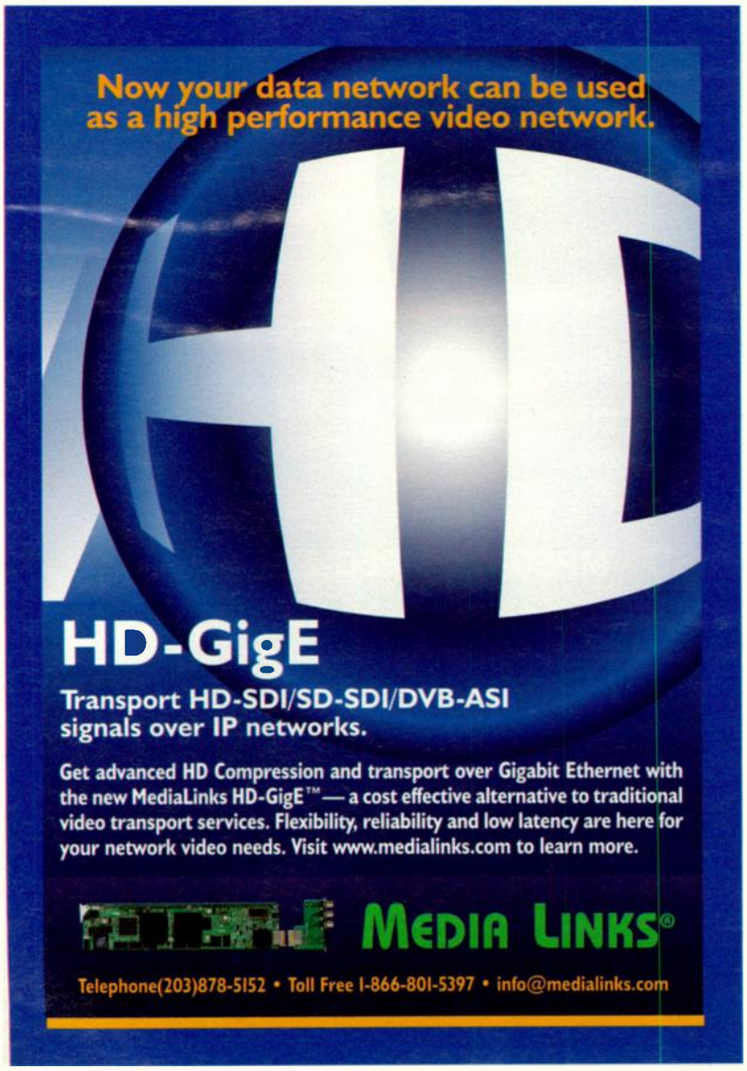
ILL-FATED PAIRS

Certain other channels may also be subject to such interference. In my Feb. 21 column, I showed that the IM3 spreads out over a number of channels. IM3 for two U signals covers the D channel and six other channels.

How can this possibly be? The answer is that for a signal pair well removed from channel n, for example, n+3 and n+6, these signal pairs reach the mixer and overload it, creating IM3, some of which falls in the desired channel n. When the D signal is below about –50 dBm, and the U signal pair is outside the pre-detection bandwidth of the RF automatic gain control, the RF amplifier will be oper-



World Radio History

ating at maximum gain, thus amplifying the U signals on n+3, and n+6 or n-3 and n-6. What is the solution?

Either the mixer must have a higher third-order intercept power or the RF selectivity ahead of the mixer must be improved, or both. The classic way to improve mixer linearity is to increase local oscillator power injected into the mixer and to design the mixer to handle this power.

In my RF test bed, I use mixers rated for local oscillator power input of +17 dBm. The total signal power input to such mixers must be below +7 dBm. Each of these U signals would have to be kept below +4 dBm at the mixer input. Now if the RF amplifier has a gain of say 15 dB, the maximum U signal power, (per signal) is limited to +4 dBm – 15 dBm = –11 dBm. This small calculation tacitly assumes the RF amplifier at maximum gain is delivering +4 dBm per each U signal and output is perfectly linear.

A LOT TO BE DESIRED

Yes, there may be some attenuation of these U signals, especially the signal on n+2k in the tracking filter of the tuner, but this just gives us a margin, not a miracle. The RF selectivity of these modern DTV receivers leaves a lot to be desired; the FCC found that even signals on n+8 and n+16 caused interference.

As for RF selectivity, last time I looked, tuners had two sets of tuned circuits—a single-tuned circuit between the antenna port and the RF amplifier, and a double-tuned circuit between the RF amplifier and the mixer. But as this column has noted, the latest thing in tuners is an integrated circuit built on a silicon substrate. Just how such a structure could support a tracking filter (three tuned circuits whose resonant frequencies track the D signal) escapes me.

So how did Zenith, more than a decade ago, design a DTV tuner with sufficient RF selectivity to protect the mixer from interfering signals about 60 dB above the D signal? They did it with a double-conversion topology and a first intermediate frequency filter at 1,200 MHz and a fixed tuned bandpass filter just wide enough for the D signal. This filter was located after the first mixer. The first mixer must have been very good, not to have suffered overloading.

In short, tuners today are built with excellent first-adjacent channel interference rejection at moderate and strong D signal levels by means of a smart form of RF automatic gain control. That takes care of the expected adjacent channel interference, but not the unexpected interference in a large part of a station's coverage area.

The RF selectivity of these modern DTV receivers leaves a lot to be desired; the FCC found that even signals on n+8 and n+16 caused interference.

As there are no D/U numbers given in the FCC rules for DTV-DTV interference, it appears that some manufacturers of tuners believe there is no need to worry about taboo channel interference in tuners that will never see analog TV signals.

Meanwhile, tiny tuners with mediocre RF selectivity are popular today. Tomorrow, DTV receivers for pedestrians, which are by their nature battery operated, will have even greater problems with interference because their tuners will have very little power, they will have minuscule antennas and be very close to the ground where signals are especially weak.

All the above might be considered good news, meaning that there is bad news coming.

Reports from the Canadian Research Center and FCC Laboratories studied the effect of interference to DTV reception from one and two U signals, but not three or more signals.

CHECK OUT ALLOTMENTS

Look at the DTV allotment table for your community. You might want to note how many permanent channel allotments are in the UHF band, and at the high VHF-band allotments.

High VHF is probably a sleeper. It may be subject to unanticipated interference from other DTV signals in the high-VHF band and from the unlicensed transmitters soon to appear on the band. Two undesired signals of equal power produce a certain amount of IM3 in a given tuner.

If there are three U signals of equal power, their total power is about 5 dB greater than one alone. This means that the IM3 is 15 dB greater than with just one U signal. This IM3 spreads out across three channels for one U signal, or across seven to 20 channels for two U signals, or across

INTERFERENCE, PAGE 50

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PRODUCTION MANAGER **Craig Johnston**

Don't Let What Can't Be Done Get in the Way

The annual trek around the NAB exhibition floor does nothing if not remind all of us that television production is a tool-rich endeavor. From the exhibitor working from a card table all the way up to the mega-exhibitors, everybody's selling the perfect tool to do something.

None of us can afford to buy them all. And even if we did, we'd never have enough space to store them all.

So video producers, from the weekend, one-man-band event videographer to the huge teleproduction facility—none of us is going to have the perfect set of tools to do everything we want to do. The lack of the perfect tool can be the cause of a lot of negativism on your staff.

Your job, then, is to not let what they can't do get in the way of what they can. And sometimes it's surprising to see what can be done with the tools we do have.

I spent some time once with a fellow who used Adobe Photoshop a lot. By a wide margin, he was the most über-user of that massive program I'd ever met. When I told him that, he said "bull feathers," there were users who knew and used a lot more of the program than he did.

"Does anybody use the whole thing?" I asked.

He said he and some other power-users tried to figure out the answer to that question once. After comparing notes, they decided that the most any one individual ever used out of Photoshop was well less than half that program's capabilities.

That's likely also to be the case for editing programs, CGs, camera setup menus and the like in your own shop.

READ ABOUT IT

So to start with, make sure your staff gets what it can out of the tools you do have. You can start with the equipment manual itself, but it depends heavily on how well the manual is written. And I understand that some people are not good at reading manuals.

Then there are user groups. Some are formally sponsored by the vendor; some are ad hoc. The Internet has made these easily available to your staff, and if somebody hasn't already answered the question they have, and if they have enough time, they can post a question and hope for a response.

But one of the best user groups, assuming you're not a one-man band, is among the employees in your own shop, or in your own station group. Each of them likely has had a slightly different experience with the equip-

Interference

CONTINUED FROM PAGE 49

up to at least 17 channels in the case of three U signals.

You may not want to think about the spectrum spreading with four or more U signals. Note that I didn't say four or more DTV signals because signals from unlicensed transmitters will behave in the same way as DTV signals, which get to the mixer of DTV tuners. Spectrum plots of IM3 for one, two and three U signals were published in the Feb. 21 issue of this magazine and should still be available at the Web site. I should soon have some spectrum plots involving four DTV signals and the IM3 they generate.

I am amazed at how calmly the broadcast industry is taking this interference problem. Just think about how many viewers believe that with DTV signals, one will not need a rooftop antenna because, don't you know, digital technology works miracles. Well, read the FCC Labs Report. Interference due to tuner overload will exist clear out to your noise limited contour! This is your problem.

Charlie Rhodes is a consultant in the field of television broadcast technologies and planning. He can be reached via e-mail at cwr@bootit.com.

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The lack of the perfect tool can be the cause of a lot of negativism on your staff.

ment, accidentally discovering different capabilities. They don't have to wait until there's a pressing need to learn more from their colleagues; you can encourage them to get on the phone every month or so, and even swap demo tapes that show these capabilities.

But when the chips are down and they need to figure out how to do something, it can really help to put several minds to work on the problem. I've told this next story before in Production Manager, but I think it's illustrative of this point.

EUREKA!

We were putting together a very complicated, multilayered news open and were offered the opportunity to finish the assembly of all the elements in a digital suite at our sister station. The editor from my station and I had a pair of four-hour sessions booked on consecutive days with an editor who had a lot of experience in that digital suite.

I knew the least, technically, about how we were going to get it done, but I was there as kind of the cheerleader. I also was the clock-watcher, setting benchmarks as to how far we should be along with the project at any point in time.

The first three hours we went gangbusters. By my figuring, we were already into the second day's work by that point. And then we hit a wall. The two technical whizzes were buffaloed, and I certainly wasn't any help. They threw out all sorts of ideas that fourth hour of the first day, and over lunch that followed. It just wasn't going to work.

But something happened before the next morning. Both of them seemed to have awakened in the middle of the night within about 15 minutes of each other, and each had figured out half of the solution.

Luckily there wasn't much overlapping in their thinking. When we got together later that morning, they both starting talking about what they'd come up with, and five minutes into the edit session that day they had crossed that hurdle and we finished on schedule. Their two minds added up to more than just one plus one of either of them.

And finally, there isn't always just one way that a production can be done. Can they accomplish more or less the same end result with a couple fewer graphic layers or effects?

From a management point of view, the job is to get your people thinking about what they can do, instead of what they can't.

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

World Radio History

USER REPORT

Harris Powers WCAX-TV's Digital Signal

by Howard Holden
Transmitter Supervisor
WCAX-TV

BURLINGTON, VT.

The new transmitter facility for WCAX-TV, the CBS affiliate here, could be considered unusual in several ways. The facility is owned by the station and is located on Mount Mansfield in the resort town of Stowe, Vt. We lease space to NBC, ABC and Fox stations' digital transmission systems. It is also one of only a handful of 24/7 manned transmission facilities remaining.

10 YEARS OF PLANNING

WCAX-TV's retired chief engineer, Ted Teffner—now a part-time consultant—spent 10 years planning the building design and working out leases. The new facility was built around the existing building, which was torn down from the inside. The station launched full-power digital operations in late 2006 with a Harris PowerCD UHF tube transmitter.

Harris designed a dual-cabinet PowerCD configuration for us, with a 37.7 kW transmitter power output and a dual-exciter design for maximum redundancy. The station has always championed redundancy and used two completely independent systems from 1965 to 2004 to ensure it was always on the air.

It was fiscally irresponsible to mimic the old system, considering space limitations and the expense of digital conversion. The dual-cabinet configuration with Harris Apex exciters is not the only part of the redundant design; Harris also custom-designed a dual-cooling system that separates the transmitter's IPA cooling between two independent heat exchangers.

WCAX-TV has long experience with Harris transmitters. The station uses a Platinum VHF transmitter installed in 1989 for analog Channel 3 operations. This transmitter was upgraded to a dual-cabinet configuration in 2004 when we decommissioned an older Harris BT18 transmitter.

WCAX-TV uses a Harris PowerCD transmitter for its digital UHF operations.

Technical support is also a big factor in our long relationship. Harris engineers provided an overview of the internal design and hung all the filtering and RF systems ahead of installation, while WCAX-TV built out a combiner system for the PowerCD and the NBC affiliate, which uses a Harris Sigma UHF transmitter.

Harris technical support was also instrumental in helping out another local station. WCFE-TV, a PBS member station, experienced a tower collapse during an April storm. WCAX-TV had been providing two digital feeds—the station's main programming and also a weather feed—with a Harris FlexiCoder. Harris rushed in a third digital card for the FlexiCoder, allowing us to transmit WCFE-TV programming in our digital stream. This operation was still ongoing at press time, with WCFE-TV occupying 4 Mbps out of our 19 Mbps transmission capacity. Our video quality remains extremely high even with three digital feeds.

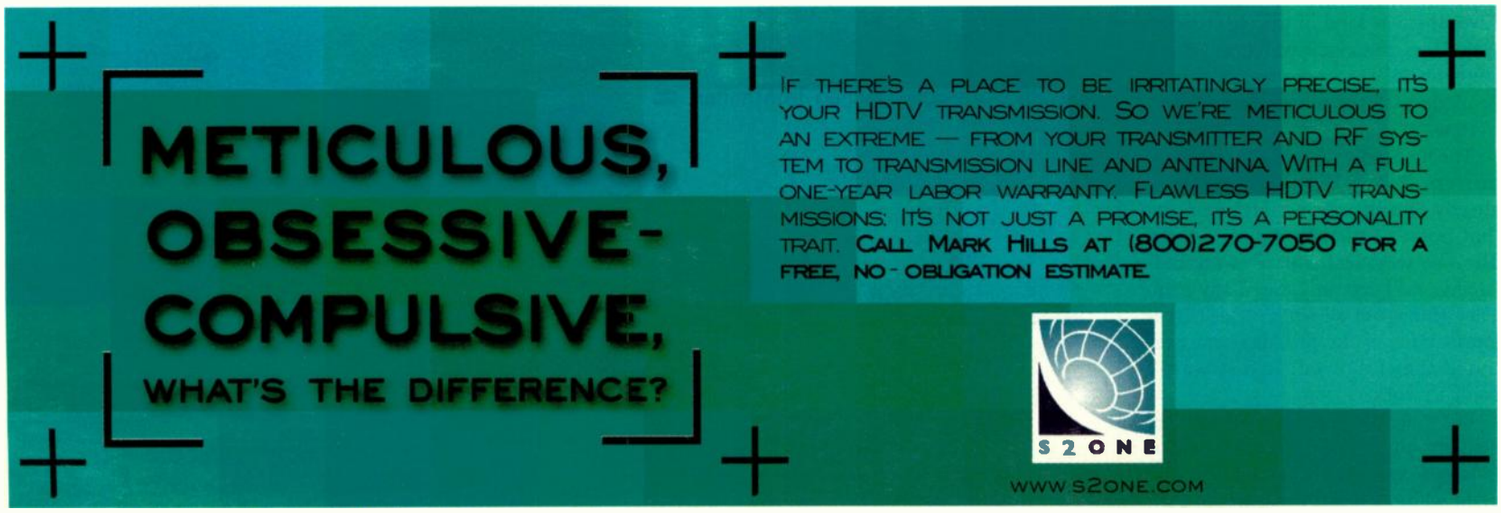
ELECTRICITY SAVED

The PowerCD transmitter, with its multicollector IOT tube design, provides economical benefits related to the enormous electrical costs here. At our electrical rates plus the additional investment in the dual-cabinet design, ROI will be achieved in four to five years.

We are now starting to realize the benefits of the Harris eCDi control and monitoring system integrated into the PowerCD transmitter. The PowerCD has an intuitive GUI on the cabinet, and the eCDi also allows us to go through the screens and parameters from a quiet desk in a separate room in the manned transmitter facility. The eCDi system also provides additional fault logging and parameters for deeper system monitoring than is possible from the GUI. We still have some time before the analog sunset, but with each passing week continue to enjoy the benefits of the PowerCD.

Howard Holden is transmitter supervisor at WCAX-TV. He may be contacted at holden@wcax.com. *Joe Tymecki, chief engineer at WCAX-TV, also contributed to this article.*

For additional information contact Harris at 800-387-0233 or visit www.broadcast.harris.com.



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World Radio History

USER REPORT

Acrodyne Solves Problem at KASN-TV

by Rusty Mooney
Transmission Systems Support Engineer
Clear Channel Television

PINE BLUFF, ARK.

When the former chief engineer of KASN-TV chose Acrodyne for the station's digital expansion, the decision initially met with some resistance. Clear Channel Television had not purchased Acrodyne products for any other station, and local engineers were required to justify their choice of vendors other than those with whom group purchasing agreements had been negotiated. Acrodyne was selected, based upon the company's advanced remote monitoring capability, which was inherent in the Quantum transmitter line.

A decision was made to replace the analog transmitter as well, since it was becoming increasingly more difficult to find parts. Also, the FCC had granted an n+1 digital allocation, requiring the locking of each exciter to an external reference—an option not available with the former transmitter's exciter.

With the combined antenna chosen for the project, we needed an analog transmitter capable of 92 kW output, and a digital transmitter capable of 19.1 kW output.

We also asked that Acrodyne develop an installation plan that would allow the station to remain on the air at reduced power while the work was being performed. The transmitters were installed in the existing building with the addition of a covered concrete slab for the heat exchangers and beam power supplies. They were powered up and went on the air in 2002.

NO MORE 2 A.M. CALLS

Since that time, we have seen a remarkable increase in reliability over the former analog transmitter, and have been very pleased with the performance of both. Our transmitter supervisor will certainly agree with that statement, as the 2 a.m. phone calls he used to get several times a month are now history. Also monthly power bills for the site are lower than they were for the old analog transmitter, even with both new transmitters operating at full licensed power.

The Acrodyne Quantum television transmitter

We have been extremely impressed with Acrodyne's commitment to quality and customer service. They are constantly working to improve upon an already impressive product line, and the Rohde & Schwarz exciters being used provide the best looking video I've seen from a UHF television transmitter.

The Linux-based monitoring and control system in the Quantum transmitter line was very appealing to us. When we first purchased the transmitter, the remote-control feature was something of a novelty. However, during the past couple of years, it has saved countless trips to the transmitter site.

When you factor in the savings in manpower and vehicle expenses, the remote control feature is a huge asset to our bottom line. In an industry with diminishing emphasis on RF skills, the ability to remotely troubleshoot a transmitter is becoming more and more important. Quantum allows us to monitor many different parameters remotely, which was not possible with traditional parallel-interface systems.

Every analog transmitter replacement that Clear Channel Television has undertaken since the KASN installation has been with an Acrodyne Quantum. The most recent was a depressed-collector transmitter installed in Mobile, Ala. We couldn't be more pleased with our decision to purchase the Quantum transmitters.

Rusty Mooney is the transmission systems support engineer for Clear Channel Television. He has worked in broadcast engineering since 1989, and has been employed by Clear Channel Television since 1991. He may be contacted at rustymooney@clearchannel.com

For additional information contact Acrodyne Industries Inc. at 610-917-1182 or visit www.Acrodyne.com.

USER REPORT

Sutro Tower Sold on Dielectric

by Gene Zastrow
General Manager
Sutro Tower Inc.

SAN FRANCISCO

Sutro Tower, Inc. has been in the business of providing transmission services to Bay Area broadcasters since 1968, when the owners of local stations KTVU, KRON-TV, KPIX-TV and KGO-TV joined together to form the company. The transmission facility went on the air in 1973. The company continues to maintain and monitor the shared tower site, which now leases space to 11 television stations, five radio stations and 20 commercial users.

The Sutro Tower accommodates 11 television stations, five radio broadcasters and 20 commercial users.

As general manager, I've always had a hand in finding the right equipment to meet the specific needs of our leasing stations. From the start, Sutro Tower has relied on Dielectric Communications to provide the antennas, transmission lines and combiners. The equipment has served us well and we've continued to enjoy a positive working relationship with the company throughout the past 35 years.

NEW PANEL ANTENNAS

When the FCC DTV mandate first went out and it was time to take the leap to digital, we again turned to Dielectric to bring our tower site up to date. Dielectric worked closely

DIELECTRIC, PAGE 60

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World Radio History

USER REPORT

Smart 'Alien' Installs New KPVI Transmitter

by Nick Davidson
Transmitter Guy
KPVI Television

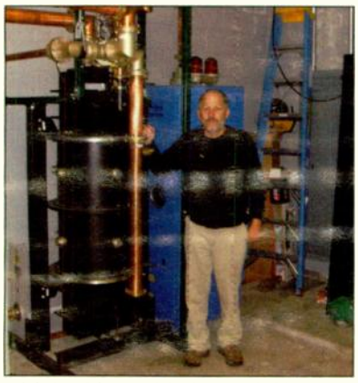
POCATELLO, IDAHO

It was my first contact with a really smart alien! That's how I felt when I met Mark Hills of s2one. I learned more from this guy in one week than I have learned during many years in the school of hard knocks. I've been working in engineering at KPVI television here for the past 20 years and have been mostly on my own, with just a few people around that I could ask for advice.

HELP ARRIVES

I was told that some "English guy" was coming to Pocatello to help with the installation and proof of our new HDTV transmitter. I hoped that he knew what he was doing, because I certainly didn't feel qualified to do the job.

Mark arrived in a big pickup truck, stopped off at Home Depot with a shopping list, and then was off to the transmitter for several hours of thoughtful contemplation and discussions about the work to be done. Finally he broke out a laser level, bubble level and pry bars.



Nick Davidson with the mask filter installed by s2one's Mark Hills.

Our new transmitter was carefully leveled and its cabinets bolted together. Then Mark broke out a torch, flux, solder, pipe cutters, rags and numerous labor saving tools needed to transform a bunch of 20-foot copper lines into a variety of precisely cut interconnecting sections.

A REAL PERFECTIONIST

The mask filter, combiner, reject load and dummy load were all assembled into an impossibly small footprint. In the process, we saved a whole bunch of floor space. The process required more time than other installers might have taken; however, all the parts fit perfectly and Mark didn't charge us more for taking longer with all of the extra work. This guy is a real perfectionist. He would never take any shortcuts, even when I begged him to because I was so tired.

After the torch cooled off and the dummy load was connected, Mark set to work on the really important stuff. First he calibrated all of the test equipment and then he proceeded to sweep all the lines, combiner, load and antenna. At each step he was careful to document his work.

I've yet to see VSWR problems from any of the work he performed in connection with getting our new transmitter on the air. However, we did discover one bad flange connection. Guess who made that connection? (Hint: it wasn't Mark.)

Mark was very generous with his knowledge and was willing to explain things and walk me through procedures that others would find hard to articulate. After a complete transmitter proof, which required some calibration and post-factory tweaking, he provided us with a professionally done detailed report. As it turned out, he was involved with much of the design of this particular piece of equipment and knew just about everything there was to know about it and passed a lot of his insight along to me.

I'm looking forward to working with s2one on future projects.

Nick Davidson is in charge of transmitter operations at KPVI television in Pocatello and has been with the station for 20 years. He may be contacted at ndavidson@kpvi.com.

For additional information contact at s2one Inc. at 800-270-7050 or visit www.s2one.com.

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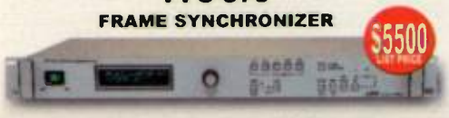

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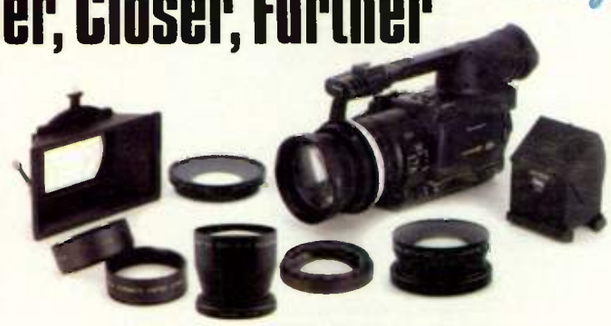

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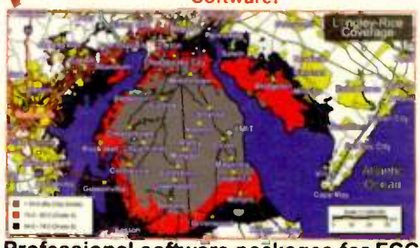

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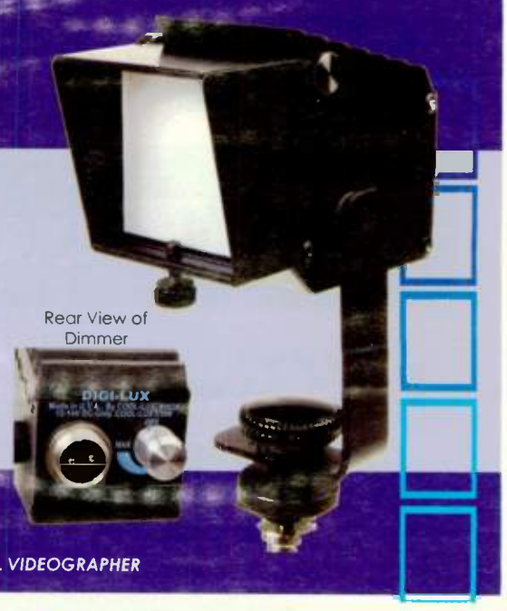

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World Radio History

USER REPORT

ERI Readies PBS Broadcaster for Digital

by Larry Holden
CEO & General Manager
Smoky Hills PTV

BUNKER HILL, KAN.

Smoky Hills Public Television has been providing PBS and Kansas public programming to the western two-thirds of the state via three full-power stations and seven translators for some time. Our digital conversion program is well under way. Our three NTSC transmitters have been augmented with two high-power digital transmitters running in tandem. (A hot-switch was mandated in the other case, as the analog channel was assigned for digital.)

Our master control operation has also been fully converted for digital multicasting and HD operations, feeding the same programming to all transmitters.

The remaining area of our conversion was in the northwest corner of the state—high plains, where wheat fields and feed lots vastly outnumber people. We decided the best way to provide digital service in this region would be to replace five old and cranky analog translators with a single full-power facility.

Workers install the first section of the new Smoky Hills PTV ERI tower.

We petitioned the FCC to assign a non-commercial educational channel to Colby, Kan., and applied for a construction permit for channel 19 in July 2005. The permit was granted 18 months later and we started building a new transmission plant. Our facility design included a 1,200-foot tower with a topmounted Trasar UHF antenna, both from Electronics Research, Inc. The tower was specified for significant ice and wind loading, as the high plains region has nearly constant winds and cold and wet winter weather. We set up a precast concrete building for the Harris CD-3100-P1 UHF transmitter, remote control gear and a standby generator. The ERI Trasar antenna and Harris transmitter were selected because we already had experience with both and have been very happy with the combination.

TOWER CONSTRUCTION

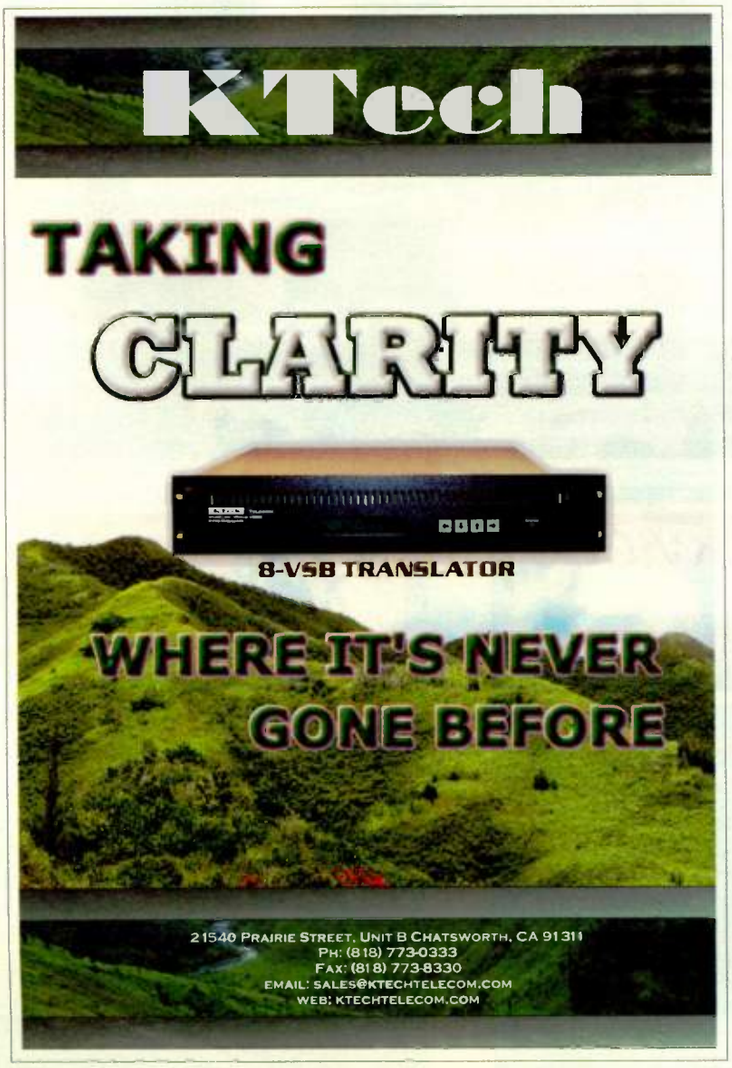
Smoky Hills contracted with ERI to manufacture and erect the tower and antenna. This provided us with one-stop responsibility for that part of the project. ERI delivered an Erector Set pile of precision galvanized parts to the site, which their subcontractor assembled into 40 sections, each 30 feet long and 7 feet on a side. Meanwhile, another subcontractor installed the tower base, along with the six guy-wire concrete attachment points, buried a dozen feet below the ground.

Superior Tower Service Inc. of Iola, Texas, assembled the 180-foot tower "stub," and then used two cranes to place it on the tower base. The first set of guy wires was installed, then a gin-pole system was used to hoist the remaining 34 tower section in place. The antenna was then hoisted into its place atop the structure and connected.

The Harris transmitter and Burk remote control equipment went in with no problems. We use a 200-mile leased fiber link to provide program feeds. The formal dedication of this facility, KWKS-DT, was held in May 2007.

Lawrence Holden is the general manager and CEO of Smoky Hills Public Television. He has been in television for more than 40 years. He may be contacted at lholden@shptv.org.

For additional information, contact Electronics Research Inc. at 812-925-6000 or visit www.eriinc.com.



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The model 9780 from **Altronic Research Inc.** is a water-cooled load resistor capable of 80 kW continuous CW operation. It features an operating impedance of 50 ohms and has a VSWR of 1.15: out to 800 MHz.

Minimum water flow required for operation is 10 gallons per minute and water fittings available are either 1/2 inch NPT or 3/4 inch.Maximum water outlet temperature is specified at 90 degrees C.The 9780 is approximately 30 inches long and 8.5 inches in diameterand is finished in bright nickel.

For additional information, contact Altronic Research at 800-482-5623 or visit www.altronic.com.

The TVS series of television transmitters from **Bext Inc.** is designed for VHF service and available in power output ratings between 5 and 30 kW.

The series features modular construction and completely solid-state operation. Each RF module used has its own power supply and each RF transistor is equipped with an individual power supply regulator. Air or liquid cooling systems are available. Protection systems include overload and short circuits, RF mismatch, loss of cooling and AC mains phase loss.

For additional information, contact Bext Inc. at 619-239-8462 or visit www.bext.com.

The RCCC-301-MU from **Jampro Antennas/RF Systems Inc.** is a digital television mask filter and combiner unit featuring a constant impedance (balanced operation) and the ability to combine outputs from analog or digital UHF television transmitters.

The RCCC-301-MU is rated at 10 kW per channel and is available to cover the 470 to 790 MHz band of frequencies. Insertion loss is specified at 0.35 dB NB and at 0.08 dB WB. Total output power is specified at 20 kW.

For additional information, contact Jampro Antennas/RF Systems Inc. at 916-383-1177 or visit www.jampro.com.

Eclipse UHF transmitting antennas from **Systems With Reliability Inc. (SWR)** feature slotted coaxial design and are equipped with fiberglass radomes for stable operation.

Antennas are available in 10 standard horizontal radiation patterns and cover U.S. UHF channels 14 through 69. Beam-tilt is a standard feature and models are available in configurations from four bays all the way up to 32 bays. Sidemounting brackets are included with all models and elliptical polarization is available for Eclipse models.

For additional information, contact Systems With Reliability Inc. (SWR) at 800-762-7743 or visit www.swr-rf.com.

World Radio History

USER REPORT

COBI Set for Digital Future With KTech

by Steve Arnold
Corporate Engineer
California Oregon Broadcasting Inc.

MEDFORD, ORE.

California Oregon Broadcasting Inc., or "COBI" for short, is a family-owned broadcast group founded in 1953 and based here in Medford. The company runs three full-power television stations in Oregon—KOBI-TV in Medford, KLSR-TV in Eugene and KOTI-TV in Klamath Falls, (The latter operates as a satellite of KOBI, but has its own studio and creates some programming. COBI also operates a couple of Class A LPTVs and about 40 VHF and UTF TV translators. In addition, COBI owns and operates a cable system in central Oregon.

We currently use two KTech XTreme-1000 units as 8-VSB DTV exciters for our DTV transmitters in Eugene and Klamath Falls.

KLSR-TV in Eugene operates on Channel 31 and runs 88 kW ERP. The transmitter is fed by an analog microwave link feeding directly into the XTreme-1000 exciter. The KTech unit demodulates and remodulates it into the 8-VSB signal with linear and nonlinear precorrection. The Eugene transmitter operates essentially as a high-power translator. The output of the exciter feeds a Pineapple driver amplifier, which in turn feeds a Thales IOT transmitter with mask filter running at 8 kW output. Thales ran a complete proof on the installation, and it easily met all FCC requirements. We use a Scala antenna array optimized to minimize the multipath encountered with the mountainous terrain around Eugene. The resulting signal is a full-power HDTV signal that can be received within that market by using a clip lead as an antenna.

Steve Arnold at work in the KOTI-TV transmitter on Stukel Mountain in Klamath Falls, Ore.

A BETTER CHOICE

At our Klamath Falls operation, we feed the KTech XTreme-1000 DTV exciter with an ASI signal. The exciter's output directly feeds the pre-driver stage of a Larcan 1,500 W DTV transmitter. After the mask filter, it hits a Microcom 12-panel array antenna. This gives us an 8.7 kW signal on Channel 13. This DTV signal covers the market better than our originally allocated UHF signal could have. We're using set-top demodulators to feed a couple of analog translators that reach some remote cable systems. Previously, these translators had been receiving our KOTI-TV analog VHF signal and the results weren't that great. This arrangement is working out much better for the cable systems and us.

Our third transmitter uses a KTech VSB-FRQ-200, with an 8-VSB output feeding an ASI/SMPTE-310 converter unit, which feeds a 4 kW Thomson transmitter. This arrangement provides a temporary channel 15 HDTV signal while we await the end of analog broadcasting. At that time, we will move digital operations to VHF and Channel 5.

We have acquired another XTreme-1000 that we will be installing this summer. It will allow us to feed ASI HDTV video directly to the exciter. The transmitter feeds an SWR slot antenna with a resulting 40 kW ERP, which provides a usable signal to the Medford area, although somewhat weaker than that from our other stations in their total respective DMAs.

Steve Arnold is a corporate engineer at California Oregon Broadcasting Inc. He has 30 years of radio and television transmitter and antenna engineering experience. He may be contacted at Steveadome@aol.com

For additional information, contact KTech Telecommunications Inc. at 818-773-0333 or visit www.ktechtelecom.com.

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World Radio History

USER REPORT

Axcera Transmitter Does It All in Houston

by Robert Byrne
Director of Engineering
KRIV/KTXH Television

HOUSTON

Fox O&O stations KRIV and KTXH have been in operation for more than 30 years in this television market and I've been the director of engineering at both stations since 2002. In addition, I've served as RF systems supervisor at KRIV since 1989. In these capacities, it has been my job to oversee numerous equipment changes at the studio and transmitters for the duopoly operations.

Robert Byrne with the Axcera Innovator HX solid-state transmitter installed for Fox O&O facilities in Houston.

DUAL-USE TRANSMITTER

The latest of these would be the four-channel Axcera HU20KA/10KAD dual-use auxiliary transmitter, custom designed and configured by Axcera. What makes this transmitter unique is that it can operate on all four of our digital and analog channels.

KRIV is transmitting an analog signal on Channel 26 and a digital companion on Channel 27. This is known as an n+1 system because the digital channel is the next higher adjacent channel to the analog. KTXH broadcasts in analog on Channel 20 and in digital on Channel 19, which is an n1 situation. Both stations have never had any form of auxiliary transmitter and have always had to go completely off the air for most types of maintenance or repairs.

We approached several transmitter manufacturers to determine if they could build a single, frequency-agile transmitter that could operate in both NTSC and ATSC modes. We also wanted channel selection to be simply a matter of pressing a button on a remote control system, allowing us place any one of our four stations on the air. The only manufacturer that could do it with already proven equipment was Axcera.

GENERATING AXCITEMENT

Axcera's Innovator HX series solid-state transmitter was our choice for this project. The NTSC analog exciter is frequency agile, and is controlled by a custom switcher that selects the correct frequency with a single button. The ATSC digital exciter—called the "Axciter"—uses Axcera's new second generation adaptive modulator. As with the analog exciter, it is also frequency agile and is controlled by the same switcher, with single-button control for the desired channel. We are using an external audio/video switcher for routing the correct programming into the NTSC exciter. The Axciter has its own built-in inputs for program selection.

We used two existing IMD/mask filters and two new IMD/mask filters with this system. External motorized coax switches are automatically configured when the specified channel is selected. The new filters and coax switches were provided by Axcera as part of the package. All of this goes into a wideband antenna that is sidemounted at the 1,770-foot level of a leased broadcast tower approximately one mile away from KRIV's main tower site.

As with anything new, and the fact that this is the first of its kind in operation, this unit wasn't without a few bugs or problems. But Axcera demonstrated its strong technical service capabilities by working through every single one and I can say the HX is operating as originally planned.

We have operated on all four channels now at various times to perform general maintenance on the main klystron- and IOT- based transmitters without losing airtime, thanks to the flawless operation of the HX.

Robert Byrne is director of engineering for KRIV/KTXH in Houston. He has been in broadcasting since 1983. He may be contacted at robyrn@aol.com.

For additional information, contact Axcera at 800-215-2814 or visit www.axcera.com.

Dielectric

CONTINUED FROM PAGE 54

with us to determine the best solution, and we installed four TUP-C3-8-1 panel antennas along with four runs of 6-1/8-inch EHT-coated transmission lines. Our installation also included four new combiner systems, which take the signals from our various stations and combine them together to feed the antennas.

Not only have the products performed almost flawlessly, Dielectric's service during the installation was certainly noteworthy. Due to the logistics involving our tower site and the number of stations we support, the design of our combiner systems was especially crucial.

Dielectric met with us repeatedly to design the system, and they spent considerable time on site to meet with each of our leasing stations, and offer assurance that specific needs would be taken into account as well.

SPACE CONSIDERED

We had a relatively small area available for new equipment, so space was a definite consideration. Also, our tower is not the usual straight-up guyed mast. There are some unique architectural features that had to be worked around. To accommodate the unusual and challenging angles, Dielectric manufactured a custom system for us, fine tuning the combiner systems and also engineering the transmission lines to custom-fit the shape of the tower.

Once complete, the installation of the Dielectric systems equipment allowed us to bring DTV functionality to our network affiliates right away. Several additional stations were subsequently added to the digital antenna.

As the final FCC DTV deadline approaches, we've again selected Dielectric as our technology provider for making a full transition to digital broadcasting. Over the next few years, we're looking forward to installing Dielectric's TFU-WB UHF slot-cavity antennas, TFU-JSC/VP high-power pylon antennas, and TUC and TUA wideband UHF panel antennas—as well as the associated combiners, transmission lines, and other supporting components.

When it's time to replace our analog antenna, we'll be installing the new equipment in the coveted position at the top of the tower. This will allow us to improve the quality of the stations' broadcasts and allow them to reach even more viewers. For viewers in the Bay Area, this new Dielectric equipment will translate into better television.

Gene Zastrow is general manager of Sutro Tower, Inc. and oversees the company's multistation tower site in the heart of San Francisco. Zastrow has in the television broadcasting industry since 1961. He may be contacted at genez@sutrotower.com.

For additional information, contact Dielectric Communications at 800-341-9678 or visit www.dielectric.com.

World Radio History

USER REPORT

LeSea Transitions to DTV With Thomson

by Wes Hylton
Director of Engineering
LeSea Broadcasting

SOUTH BEND, IND.

LeSea Broadcasting currently has all seven of its UHF stations on the air in digital, using Thomson transmitters. We've got solid-state Affinity systems in Hawaii, running at 1 kW, and DCX Paragon MSDC-IOT high-efficiency transmitters, using dual-tube architecture at 300 kW ERP.

We've been on the air in digital for three years now, and are well ahead of the 2009 analog shut-off date.

We're using the DCX Paragon transmitters at our operations in Denver, New Orleans, Indianapolis and here at WHME-DT in South Bend. The DXC Paragon's very efficient multistaged depressed collector inductive output tube is saving us money in utility bills.

LeSea Broadcasting's WHME-DT transmission facility includes a Thomson Paragon dual-IOT transmitter.

DIGITAL SINCE 2004

Our oldest DXC Paragon installation has been operating since late 2004 and has worked very respectably. We did have some initial issues during the installation stage, but Thomson really supported us and made the necessary fixes.

We like the fact that all of the Thomson transmitters can be remotely monitored and controlled. This allows us to check the status of, and change settings on, the transmitters from each station's master control suite or from an engineer's home.

All of our chief engineers have the Web GUI for remote control and monitoring. This saves us time and the headache of having to visit a site. If there's a problem, we know immediately (via e-mail or an intuitive Web interface) and do what's necessary to fix it.

From South Bend, I can see the transmitters in Denver, New Orleans and Indianapolis. It's really powerful stuff.

I've seen a lot of remote control systems and this one is the best. It has the most of what I want in a diagnostic system and provides the flexibility to set it up the way I like.

We also selected Thomson because their transmitters offer redundancy to protect against system failures. In ordering the Paragons for each station, we purchased the two-tube system, so we essentially have two transmitters running in parallel mode. If one side goes down, the other automatically picks up and we stay on the air with 50 percent power. We also use dual exciters and dual water pumps.

This architecture is also useful when making repairs or performing general maintenance. We can shut down one side and continue to operate on the other. This used to require jumping through a lot of hoops to avoid affecting our signal.

SOLID-STATE IN HAWAII

We installed Thomson Affinity UHF solid-state transmitters in Hawaii as the state is fairly small and we only need about 1 kW ERP to cover it adequately. The Affinity power amplifiers feature a hot-swappable design, allowing replacement of any power amplifier while the transmitter is on-air.

I try to keep the transmitters running as a cohesive system. That's why we chose a common supplier. If our chief engineer in Denver has a problem and resolves it, then that information can be shared with the rest of the group, saving time and money.

All of our stations are at approved power levels and coverage is more than acceptable. We plan to buy four new ones to replace the analog ones we have now. System reliability and remote control capability are what we look for in a transmitter. With the Thomson systems, we got that and a whole lot more.

Wes Hylton is director of engineering for LeSea Broadcasting in South Bend, Ind. He has been with LeSea since 2002 and his areas of responsibility include television, FM and satellite. He may be contacted at whylton@lesea.com.

For additional information contact Thomson Grass Valley at 800-547-8949, or visit www.thomsongrassvalley.com.

World Radio History

USER REPORT

PSI Service Gets High Marks At Barrington

by Keith Bland
Senior Vice President
Technical Operations
Barrington Broadcasting Company

HOFFMAN ESTATES, ILL.

In 2004 Barrington Broadcasting acquired a construction permit for Channel 46 in Bay City, Mich. from Acme Television. Although a good deal of preliminary work had already been done by Acme, we still needed to construct a tower and transmitter facility. Also due to Canadian border issues, the facility would have to use a custom directional antenna that had been designed by Propagation Systems Inc.

ANTENNA AND FEEDLINE

In preliminary conversations with PSI, the concept of having the company not only provide the antenna and transmission line, but also handle the entire project on a turnkey basis. PSI agreed to manage the project, which included the design and construction of a new transmitter building as well as the erection of a 1,000 foot tower.

The WBSF Channel 46 PSI antenna is hoisted into place.

PSI handled all aspects of this project, including working with the various local, state and federal governments to obtain all necessary zoning and construction permits, contracting for the tower and transmitter building and installation of the UHF transmitter.

This was my first experience in using a third party to manage a project of this magnitude and I will admit that we entered into the relationship with PSI with some wariness. As it turned out, my fears were unfounded. Although the permitting process was excruciatingly slow and tedious, the PSI engineers worked through the issues and we finally were able to begin actual construction in late summer of 2006.

WORKED THROUGH SNAGS

The usual minor snags were encountered during the construction process, but the PSI folks stuck with it and worked through each issue. We turned on WBSF as a CW affiliate in fall of 2006 with virtually no problems.

While this project was under way, we at Barrington were very busy growing our company through acquisitions that brought us to our current portfolio of 21 television stations across 15 markets. In retrospect, I don't think that we could have handled the construction of WBSF using only in-house resources.

The design and construction of WBSF was fraught with complications and frustration, but the folks at PSI showed remarkable attention to detail as well as creative problem-solving skills and managed this project to a successful conclusion.

We have been operating WBSF in conjunction with our NBC affiliate WEYI-TV in the Flint-Saginaw-Bay City market with virtually no technical problems since September 2006.

Given the complexity of the WBSF project I was very pleased with the efforts of PSI and its engineering team.

Keith Bland is the senior vice president, technical operations for Barrington Broadcasting Co. He may be contacted at kbland@barringtontv.com.

For additional information contact PSI at 814-472-5540 or visit www.psibroadcast.com.

World Radio History

USER REPORT

Burlington DTVs Choose Rohde & Schwarz

by Matt Servis
Director of Engineering
WFFF-TV and WVNY

BURLINGTON, VT.

It's nice when you can go to your corporate folks and say that the transmitter you really want also happens to be the most cost-effective. Usually, it's "I want to buy this and it's more money."

When you have to explain to people who may not be technically inclined, you have to do a lot of justification. So it was a doubly happy day last year when we recommended placing an order for two Rohde & Schwarz solid-state transmitters for our DTV build-out. After researching the choices, we were confident that we were getting the best transmitters for our applications, and they just happened to be the most affordable.

Our two stations cover Vermont, northern New York and New Hampshire, and we spill into Canada—where we actually have more viewers than in the United States.

Our studios are in Burlington, but the transmitter plant is located atop Mount Mansfield, which is 17 miles away line-of-sight, and an hour-and-a-half away by road.

It's Vermont's highest peak at 4,393 feet, and is a minefield of complexities for broadcasters. In addition to a number of environmental and aesthetic considerations, it's often a problem just getting to your transmitter. Due to snow, we have limited access for much of the year and have to use snowmobiles. Even then, access is restricted because of skiing activity. Trips must be scheduled early in the morning or late at night.

WISH LIST

Reliability was at the top of my transmitter wish list—anything to reduce trips up the mountain. So we looked at several different manufacturers and their transmitters.

Among the solid-state units, those by Rohde & Schwarz looked best. After meeting with their rep, we focused on their model NW7090 VHF for our 2 kW DTV channel and a model NV7340 for the 5 kW UHF DTV application.

One of the Rohde & Schwarz NV 7000 series of liquid-cooled, solid-state transmitters.

I knew that Rohde & Schwarz had a solid reputation for test and measurement, but since this was a major investment, I had to be certain about their transmitters. I visited a buddy of mine, Sarge Cathrall, director of engineering at WXXA-TV in Albany, N.Y. Sarge had installed a Rohde liquid-cooled transmitter for his digital expansion and was extremely pleased with it. That was enough for me.

We placed our order in April 2006 and by October, our new transmitters were installed and commissioned. Dave Benco, the Rohde & Schwarz project manager did a fine job of following though on everything. So far, both transmitters have been super reliable.

A controller allows us to remotely monitor and operate the transmitters via a simple Web browser. I really like that, as we don't need any special equipment and I can have others look at the transmitter remotely. I can even access the transmitters from my office or home.

We had another pleasant surprise—when numbers were crunched, we found that we were even saving on electricity. Rohde & Schwarz turned out to be not only the technical solution, but also the most cost-effective transmitter.

GOOD PROBLEM

One of the things that others had told me about Rohde—and I've said it myself now many times—is that I'm very happy with the reliability and performance. The only problem is that if it doesn't break, you don't get to learn how to fix it. When it's up on Mount Mansfield and it's 20 degrees below zero with 14 feet of snow in some places, I guess that's an good problem to have.

Matt Servis is director of engineering at WFFF-TV and WVNY in Burlington, Vt. He may be contacted at mservis@fox44.net.

For additional information contact Rohde & Schwarz at 888-837-8772 or visit www2.rohde-schwarz.com.

BUYERS BRIEFS

The LC series of transmitters from **DMT USA** are available in both digital and analog digital-ready models. The transmitters are engineered for operation throughout the entire UHF band and are available in power outputs of up to 2.4 kW for digital service and up to 20 kW in analog. Liquid-cooled transmitters are constructed with LDMOS solid-state technology. DMT models feature modular construction and hot-swappable assemblies.

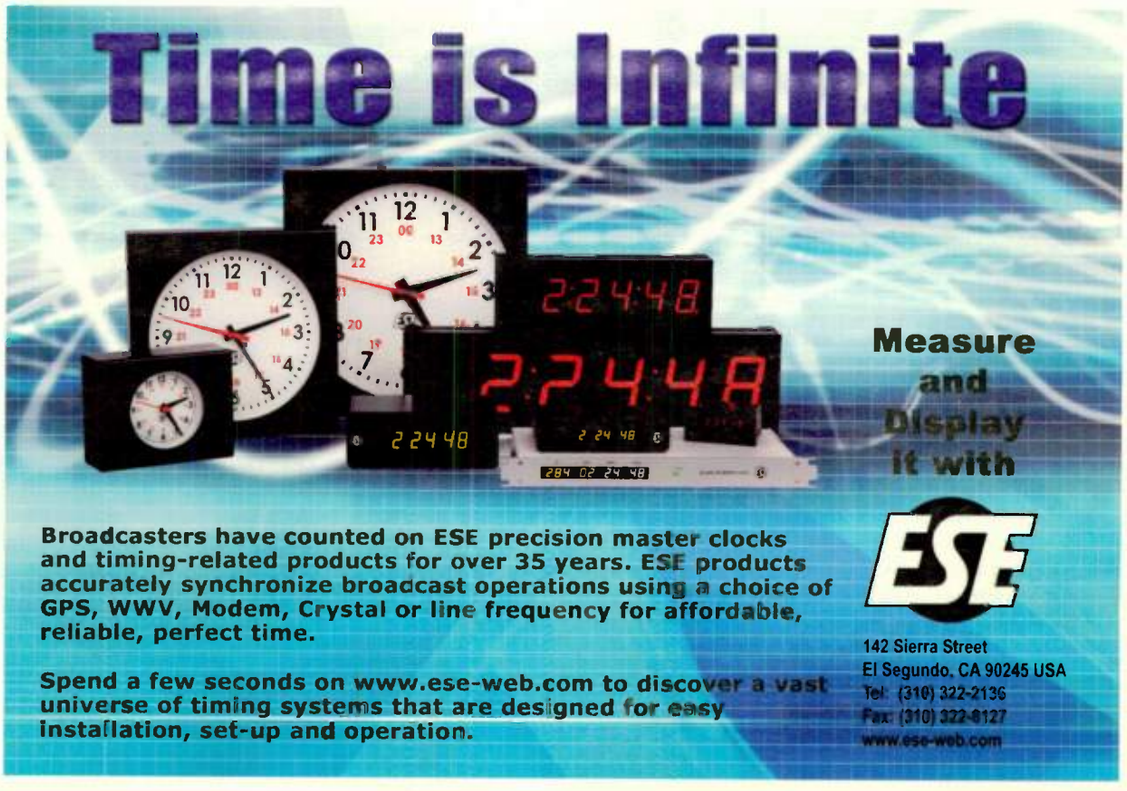
For additional information, contact DMT USA at 856-423-0010 or visit www.dmtonline.us.

The ESCIOT5130W is an **e2v** five-stage water-cooled high efficiency inductive output tube designed for operation in the 470-810 MHz television band, and can be used for analog or digital service. It is rated at 66 kW in analog visual amplifier service. The tube features continuously tunable external cavities with digital frequency indicators. The electron gun is constructed with a barium aluminate cathode and pyrolytic grid for long life.

For additional information, contact e2v technologies inc. at 800-342-5338 or visit www.e2v.com.

The LTX100U from **Pineapple Technologies Inc.** is an integrated UHF transmitter for LPTV service and other applications. It is frequency agile and can be operated on any standard UHF channel with minimal adjustments and changes.

It is rated at 100 W output and consumes less than 600 W. It has a built-in band pass filter. *For additional information, contact Pineapple Technologies Inc. at 916-652-1116 or visit* www.ptibroadcast.com.



World Radio History

MARKETPLACE

Highlighting the latest products available to professionals in the video industry

Interface Card For Yamaha Consoles

The 6416Y2 A-Net from Aviom is a new interface card for use with Yamaha audio consoles and mix engines and Aviom's monitor mixing system.

The card provides all necessary inputs, outputs and control functions and can simultaneously support up to 16 I/Os, depending upon the capacity of the Yamaha product host device and system sampling rate. It supports sampling rates of 44.1, 48, 88.2 or 96 kbps. The A-Net cards can be also be combined in a single host device to provide up to 64 I/Os.

The card features a DB-9 connector on its front panel for either RS-232 or RS-422 data purposes and in certain applications control data may also be routed to the card via the cage backplane.

For more information, contact Aviom at 610-738-9005 or visit *www.aviom.com*.

Light Amplifier For Sony HD Cameras

A variety of Night Vision units from Electrophysics Corp. allow users of Sony high-definition cameras to expand imaging applications at night and in other low-light situations.

With the aid of these devices, HD video is possible by starlight or moonlight. They enable camera users to achieve sharp detail without vignetting or other distortion.

The Night Vision modules are designed to attach to Sony high-definition HVR-Z1, HVR-A1 and HDR-SR1 camcorders to provide adequate exposure for HD work in extremely low-light situations.

For more information, contact Electrophysics Corp. at 973-882-0211 or visit *www.electrophysics.com*.

Dual Channel Wireless Mic System

The 320UPR from Azden Corp. is a discrete dual-channel UHF wireless microphone designed for camera mounting.

The 320UPR can operate on any of 240 user-selected frequencies and has dual digital LCD displays for multifunction readouts. The receiver is also equipped with a DC input jack for battery charging purposes. It has flexible high-gain antennas and a removable shoe-mount, as well as dual-plug XLR and stereo miniplug output cables.

The 320UPR is part of a wireless mic system from Azden and is offered in two packages: The 320ULT includes the receiver and two body-pack transmitters and the 320ULX includes the receiver, as single body-pack transmitter and one 30XT plug-in transmitter for users who want to use a handheld mic.

For more information, contact Azden Corp. at 516-328-7500 or visit *www.azdencorp.com*.

Protection For LCD Monitors

Petrol is now offering a shoulder bag for transporting 9-inch LCD monitors. The bag is designed for Panasonic's LH-900 and similarly-sized monitors and provides cushioning and protection for the monitor.

The bag's top flap can be opened to form a four-sided hood to block sunlight and glare from the monitor's face. The hood sections are fastened with hook-and-loop material that detaches to allow access to the monitor's front panel. A clear vinyl shield is provided to cover the LCD screen.

The bag includes a bottom docking slot with zippers, along with an adjustable safety strap for mounting the protected monitor onto a camera.

For more information, contact The Vitec Group, marketers of Petrol products in the U.S., at 845-268-0100 or visit *www.petrolbags.com*.

Soundcraft Interface

The CobraNet from Soundcraft is a new interface for use with the company's Vi-series of audio consoles.

The CobraNet provides up to 32 inputs or outputs, or a combination of both, for the Vi6 or Vo4 digital live sound consoles. The card interfaces with a CobraNet network to allow reception or transmission to or from a total of 32 sources or destinations.

The addition of the CobraNet card also enhances the use of Vi consoles within a Harmon HiQnet system by providing audio and control functions to be integrated within the console.

For more information, contact Soundcraft USA/Harman Pro North America at 818-920-3212 or visit *www.soundcraft.com*.

Camera Stabilizer Spring Arm

The ACT 2 from Sachtler is a spring arm for camera stabilizing systems, including the artemis EFP, EFP Pro SDI HD, Cine and Cine HD. The arm weighs 3 pounds and a careful choice of structural material and components provides excellent tensional strength.

The arm is designed for quick setup and allows users to choose between three interchangeable stainless steel spring sets to accommodate equipment loads between 24 and 57 pounds. Spring tension is adjusted with a single 4 mm Allen wrench.

The ACT 2 arm also features a flip-over vest attachment for easy changes from right-handed to left-handed operations. It has a 5/8-inch gimbal mounting post, which is available in three different lengths.

For more information, contact The Vitec Group, marketers of Sachtler products in the U.S., at 845-268-0100 or visit *www.Sachtler.us*.

Send new product press releases along with color photographs to:
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World Radio History

USER REPORT

CPI/Eimac Tubes Go The Distance

by James Church
Transmitter Supervisor
WSNS-TV

CHICAGO

CPI/Eimac products and I go back to 1990 with the installation of the first full power all air-cooled UHF-TV transmitter in the John Hancock Center here. We replaced a water-cooled klystron rig with a modified S-series Comark transmitter using air-cooled 2KDX40LFX klystrodes.

We operated with that unit until we moved to the Sears Tower in June 1999, and installed a four cabinet water-cooled transmitter, three analog Thales IOX units and one DCX. The IOX cabinets had the CPI/Eimac K275W tubes and the DCX had a K2D110W tube. Our transmitter power output is 118 kW on the analog side of things and 11 KW on the digital. During the installation, I was impressed with the robustness of all the mechanical components in the carriage assembly and the ease of installation and removal of the tube itself.

The water-cooled plant was much quieter than the air-cooled one, creating a better working environment for those of us who work around the transmitter.

CPI/Eimac's k2 IOT

The DCX spent the first two months operating into a dummy load while we waited for an FCC STA. After that was received, it went on-air and was not turned off except for occasional overnight tower and transmitter maintenance.

TUBE GOES 61,500 HOURS

Finally, in early May this year, I had to keep raising the RF drive level to maintain normal power. A week later, the beam current started to fall, indicating the end of life for a tube's cathode structure. The total accumulated service time at this point was 61,500 hours. You have to remember that CPI/Eimac warranties these tubes for a total of 10,000 hours!

Things were somewhat different with the other transmitter. Early attempts at managing filament current resulted in a cathode that was either too cold or too hot. (If a power tube's cathode runs too cold, it will become poisoned over time. If it runs too hot, this will create deposits on the grid, resulting in negative grid currents and generating crowbar transmitter shutdowns. We are talking only a few hundred milliamps here.)

CPI/EIMAC TO THE RESCUE

After several thousand hours of operation with the filament current set properly, some of the K275Ws would experience crowbar "fits." This resulted in tubes being replaced before the cathodes had reached the end of their useful lives. However, CPI was able to help us out. We sent the offending tubes off to them for an aging treatment, and when they were returned to us, they were considerably better mannered.

Recently, one of the treated tubes had an ion pump power supply failure, resulting in the overload trip point just being reached. The auto restart function would restore the cabinet, and then it would shut down due to the low ion pump voltage. Transmitter operators would then attempt a reset and the process would repeat itself.

As I traveled to the site to determine what was wrong, I was expecting to see many crowbars logged. Actually, there were none at all—just the ion pump power supply fault.

James Church has been transmitter supervisor for WSNS-TV since 1980. He may be contacted at j.w.church@att.net.

For additional information, contact CPI/Eimac at 650-846-3580 or visit www.cpii.com.

BUYERS BRIEFS

The L-4945A thyratron from **L3 Communications** is a large thyratron device intended for high-voltage "crowbar" applications in high-power television transmitters and other devices.

The tube features ceramic-metal construction and double-gap tetrode deuterium internal technology. It may be cooled by either forced air or by immersion in a dielectric fluid.

The L-4945A thyratron may be mounted in any position and is engineered with shielded-gap, gradient-grid construction to minimize X-ray emission and ensure stable, long-term HV hold-off reliability.

For additional information, contact L-3 Electron Devices at 800-861-1848 or visit www.L-3Com.com/edd.

The MXD 10V from **Larcan** is a compact digital UHF television transmitter with an output power rating of 10 W.

It features rack mounting and has an integrated cooling system designed for extreme environmental conditions.

The unit uses a state-of-the-art solid-state digital modulator and is designed for broadband performance.

The transmitter employes LDMOS amplifier technology and features modular construction.

The MXD 10V is designed with a linear ferroresonant power supply and includes a channel mask filter. It can be used at altitudes up to 10,000 feet and within a temperature range of from 0 to 45 degrees C..

For additional information, contact Larcan USA at 303-665-8000 or visit www.larcan.com.

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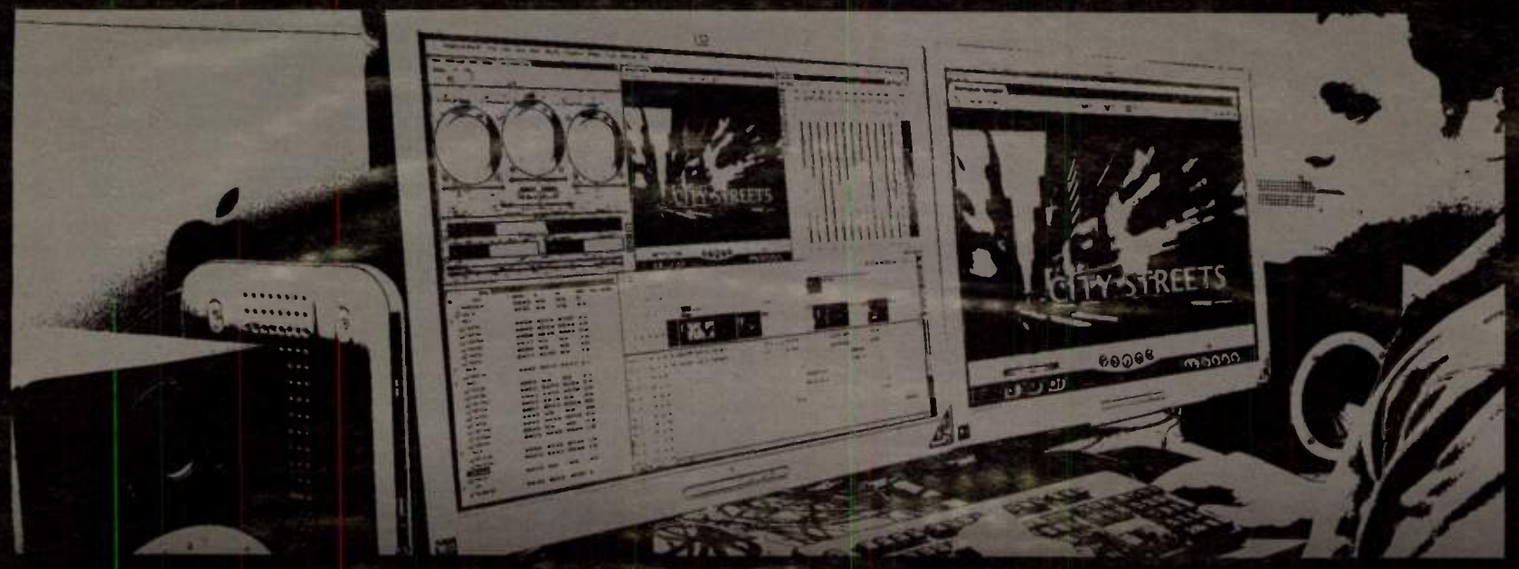

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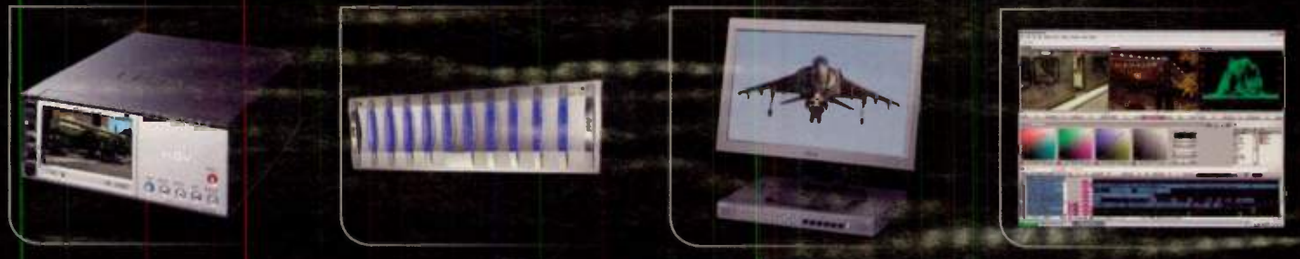

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MARKETPLACE

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IP Router For Broadcast Applications

The Utah-400iP for Utah Scientific is a new 24-port IP router specially designed for broadcast users. The unit has a built-in control panel that allows operators to instantly control switch parameters. This includes reallocating bandwidth, QOS changes and VLAN assignments.

The control panel also enables users to dynamically create security groups so the network can be partitioned into smaller virtual networks, allowing access to sensitive content only by people for whom it is intended.

Broadcasters can also use the Utah-400iP's control panel to set port speed on Ethernet networks.

For more information, contact Utah Scientific at 801-575-8801 or visit *www.utahscientific.com.*

Image Conditioning

The Proteus Ph.C from Snell & Wilcox is an image conditioning device designed to provide increased picture quality in content destined for the Web and mobile TV.

The Proteus Ph.C is compatible with virtually any video compression encoder and with all compression formats. The device enables video content to be compressed more efficiently, which results in an overall bandwidth savings for the service provider.

The Proteus Ph.C tool set includes noise reduction and motion-compensated deinterlacing and scaling. It converts incoming video to the correct aspect ratio, picture size and scanning format for the mobile devices and computer displays being served.

For more information, contact Snell & Wilcox at 818-556-2616 or visit *www.snellwilcox.com.*

Production Switcher

The Ovation MD 4000 from Echolab Inc. is a multidefinition production switcher designed for fast-paced live event coverage. The unit provides 2D and 3D DVE functionality and can accommodate up to 16 sources.

The switcher can be configured for analog or digital applications and provides up to 16 simultaneous analog and digital outputs in standard or high definition.

The Ovation MD-4000 also includes image storage and downstream keyer functions. The switcher provides users with a cost-effective way to move into high-definition video production. It is equally at home in broadcast studios, sporting venues, remote vehicles and houses of worship.

For more information, contact Echolab Inc., at 978-715-1020 or visit *www.echolab.com.*

DVI To HD Converter

The DSDI-20 from Doremi Labs Inc. converts DVI computer signals to standard- or high-definition SDI video. The unit can accommodate DVI signals up to 1920x1200.

The device supports also supports NTSC, PAL and HD video formats including 720p, 1080i and 1080p. The HD output allows users to preserve the fine detail and small type fonts that are typical in a high-resolution computer display.

It features a setup menu, which is displayed via a temporary window in its SDI output video. Users can also remotely control the DSDI-20 with GUI software. Downloadable look-up tables are provided.

For more information, contact Doremi Labs Inc. 818-562-1101 or visit *www.doremilabs.com.*

Digital Signage

X2O Media has released Version 2.0 of its Xpresenter digital-signage system. The program allows Microsoft PowerPoint users to create digital-signage content that incorporates real-time data, video clips and animation elements.

Xpresenter provides broadcast-quality video output and features a new template library that allows users to merely drag and drop prepared graphics into position. The templates are completely customizable and allow users to create a professional appearance with a minimal amount of effort or cost.

This latest version of Xpresenter also features robust network content monitoring and enhanced content distribution capabilities. It automatically synchronizes content files in playlists with files on each player throughout a network.

For more information, contact X2O Media at 408-998-8307 or visit *www.x2omedia.com.*

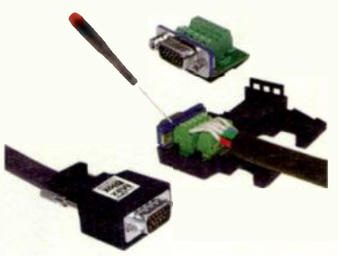
Connector Termination Aid

The new MaxBlox EZ Termination from BTX Technologies Inc. provides users with an easy termination of DB-9 or HD-15 connectors with nothing more than a cable stripping tool and an ordinary screwdriver.

All connector pins are brought up to Phoenix Contact terminal blocks, eliminating the need for any soldering by the user.

The DB-9 and HD-15 connectors are manufactured by BTX. The system accommodates wire diameters from 0.12 to 0.5 inches.

For more information, contact BTX Technologies Inc. at 800-666-0996 or visit *www.btx.com.*



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ART MDC 2001, $99; Clear-Com AP-22, $2000; Sony DTC-75ES DAT audio rcdr/plyr, $399; 360 Systems DIGICART II digital audio rcdr & plyr, $799; Clear-Com ICS-2003 intercom, $1250; Sony WRR810A/WRT822B/ECM77 wireless mic, $1200; Graham-Patten D/ESAM 200 audio mixer, $2600; GV AMX-100S audio mixer, $499; Mackie 328 8-bus Series audio mixer, $1899; Mackie SR408 audio mixer, $2499; Eventide BD600 outboard, $2995; Graham-Patten ADC20 outboard, $299; Alesis Monitor One speakers, $279; Sony tape decks, $2499. 818-551-5858 or 212-268-8800 or www.broadcaststore.com.

Wohler AMP 1A, $375; Sony PCM 7040, $3995; Sony PCM 7030, 2995; Sony PCM 7010, $750. LA 818.788.4700; NY 212.564.9933 www.tvprogear.com

Graham Patten D/ESAM 820 digital audio mixer, BO; SSL 6000E 48 input, call for price; ADC DAL3-14MKIINS digital audio patchbay, $350; GVG 8550 tray w/8-8551 audio DAs, BO; NVision NV1000 tray w/11-NV1035 20-bit AES3 A to D, BO; SSL Aysis Air Digital Mixer w/hub router, 40 faders, call for price. 908-879-9590 or www.mccominc.com.

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Sony HDC-F950 CCD digital 3 camera, BO; Sony BVW-300A Betacam camcorders, $5900; Sony BVW-400A w/lens, $4995; Sony DSR-130 DVCAM camcorders, $7995; Sony HDWF900PAC1B HDCAM camcorders, $82900; JVC GY-HD100AU HDV camcorder, $5495. 818-551-5858 or 212-268-8800 or www.broadcaststore.com.

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Sachtler 30 head & sticks, $4995; Sony Cine Alta XDCAM HD PDW-F330 new demo unit, full warranty, Only $9,900; Sony BVP-50 Camera Head, $2750; BTS LDK93 w/Studio VF, Fujinon BEVM 15X lens, CCU & Paint Panel, (steal this camera), BO; Sony LDK 90 w/Studio VF, Fujinon BEVM 15X lens, CCR & Paint Panel, BO; Hitachi C2 Camera w/Canon J15 lens, BO; Sony AC550 Power Supply, Make an Offer; Sony VA500 Color Playback Adaptor, $1000. LA 818.788.4700; NY 212.564.9933 www.tvprogear.com

Canon J20x7.5B studio lens, call for price; (2) Sony BVF-77 7" studio VF, $4000; Fuji A18x8.5FEVM B3 VGrip, 2X, $850; Sony CA-905K studio build up kit/sled, call for price; Sachtler Video 25II tripod, call for price. 908-879-9590 or www.mccominc.com.

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Sony PVM20M4U 20" Color Monitor, $1750; Sony PVM14M2U 14-inch Color Monitor, $1050; Sony BVM 20 F1U Monitor, BO; Sony BVM14F1U 13" Color Monitor, $1750; Ikegami TM9-1 9" Hi-rez color monitor, BO; Tektronix 1720 Vectorscope w/1730 Waveform monitor & dual case, $900; Tektronix 1725 Vectorscope w/1735 Waveform monitor & dual case (PAL & NTSC), BO; Tektronix WFM 300, $750; Tektronix 601 M Serial component monitor, $5500; Tektronix 601 A monitor, $4500; Tektronix 601 serial component monitor, $3500; Tektronix 1755a Waveform/ Vectorscope dual standard (PAL & NTSC) composite & component, $2995; Tektronix VM700a, $9,000. LA 818.788.4700; NY 212.564.9933 www.tvprogear.com

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Powerful Switcher Supports HD and SD

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Record on DVCPro-100, HD-Cam or uncompressed on a DDR. The standard configuration includes a Panasonic AJ-HD1400 and Sony DVD recorder.

Flypak™ works with any type of VTR

Panasonic HVX-900

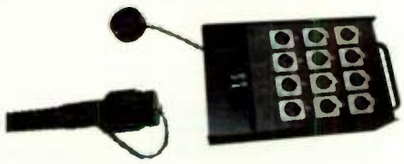
JVC GY-HD250U

TV Pro Gear opens new factory to produce $80,000 multi-camera high definition flypaks

The Miranda screen splitter feeds ten images into a 42" Panasonic screen display while simultaneously displaying tally, time-code, time of day and up and down timers. A Leader 7700HD rasterizer sends video levels and test signals to the monitor.

Signal distribution and patching. The inputs and outputs of every device in the Flypak™ are looped through patch panels. Under normal conditions no patching is necessary. However, the patch panels enable additional devices to be attached without having to change any internal wiring.

Ten Input Audio Mixer, Stage Box and other unique features. Audio is handled by a 10-input Sennheiser mixer. A stage box couples to a 150 foot audio snake with bayonet connectors on each end allow quick deployment. The stage box allows the signal from eight microphones to be sent to the Flypak™ while receiving program audio and two channels of intercom.



TVPG Audio Stage Box

The Flypak™ access panel has outputs for program audio and intercom. The access panel also has connectors for HD and SD component video to feed a floor monitor or projection system.

6-Camera Flypak™ Access Panel

A Clearcom MS-232 master station supplies two channels of intercom. Also included are a Clearcom RM-232 remote station, five beltpacks and seven headsets.

Clearcom MS-232 2-Channel Intercom

Highly portable. Designed to survive adverse conditions. The 42" Plasma screen electrically retracts into the case for shipment. The entire system is mounted in a jig welded, shock mounted aerospace quality frame capable of sustaining a 3g impact. An extreme-heat and dust resistant version of the Flypak™ is available that includes temperature controlled fans.

The entire Flypak™ runs off of a (UPS) uninterruptible power supply. TV Pro Gear's Flypak™ is completely immune to low voltage conditions or power spikes. If you lose power, the system will keep operating for over an hour. The Flypak™ draws less than six amps so even ancient household circuits are not a problem. 220 Volt versions are also available.

Warranty, Training and Documentation. The system comes with a ninety-day warranty. An optional one-year warranty is available. On site training is included.

The system comes with a full set of CAD drawings and operations manuals. Every wire in the Flypak™ is labeled at both ends designating where it goes to and where it comes from.

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World Radio History

VTRs (WTS) cont.

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Sony UVW1800 Betacam SP Recorder, $3995; Sony BVW 75 Betacam Recorder, $4950; Sony DSR-80 DV Cam VCR, $3500; Sony SVRM-100A remote for UVW series VCRs, $200; Sony VO 9850 ?" U-matic recorder, $1500; Sony SVO5800 S-VHS Editing VCR, $1250; Panasonic 7350 S-VHS Editing VCR, BO. LA 818.788.4700; NY 212.564.9933 www.tvprogear.com

Sony BVW-D75, call for price; Sony BVW-75 & Sony BVW-70's, call for price; Sony UVW-1800 w/4 chnl audio, call for price; Sony DVW-A500, call for price; Sony DVW-M2000, call for price; Sony PVW-2800, call for price; Sony UVW-1400A PAL, BO; Panasonic AJ-D580, BO; Panasonic AJ-D351, BO; Sony BKDW-515, $2000; Sony DVW-A500 PAL, call for price; PVW-2650 & BVW-65, mint, BO; Sony BVW-60's & Sony BVW-22's, BO. 908-879-9590 or www.mccominc.com.

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EMPLOYMENT

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Belo owned KHOU-TV, CBS 10th market network affiliate is seeking a broadcast technician to maintain studios, master control, and assist with repair and preventative maintenance of all other equipment in the broadcast facility. Baseline educational requirements include an Associates Degree in electronic technology or technical school. Must be self motivated, precise, and be able to work various shifts. An SBE certification in television is optional but preferred. Individual must be familiar with all broadcast related FCC rules and regulations. The candidate must have 3 years television maintenance experience or comparable work experience and a thorough knowledge and understanding of the electronics of NTSC, SDTV and HDTV television formats. A solid working knowledge of the maintenance and operations of broadcast equipment such as: digital video, microwave, satellite systems, broadcast distribution and interconnect systems that include: fiber, telephone, LAN, WAN, serial data, and remote control telemetry. Candidate must have or obtain a valid Texas drivers license. For consideration submit a resume, salary history, and references to KHOU-TV, Attention Human Resources RFE Position, 1945 Allen Parkway, Houston, TX 77019. Please no phone calls.

KRCR Chief Engineer: KRCR-TV, the ABC affiliate in Redding, CA, is seeking a chief engineer. Previous experience a must. A college degree or equivalent with SBE certification is required along with an FCC First Class or General License. EOE. See www.krcrtv.com for more information. Please send cover letter, resume and references to: KRCR-TV/KAEF-TV, 755 Auditorium Drive, Redding, CA 96001.

TV Maintenance Engineer is responsible for assisting, on projects assigned, with the maintenance of the broadcast and production systems of WPBA-TV, WABE-FM and Cable Channel 22 in Atlanta, GA. Candidate must maintain a high standard of engineering performance. Engineer works in close coordination with other departments to provide the broadcast and production engineering services needed to maintain the broadcast operations of WPBA-TV, WABE-FM, and Cable Channel 22. Responsible for the inspection and maintenance of all radio and television broadcast equipment for WPBA-TV, WABE-FM and Cable Channel 22. Assists in the training of the technical operating staff as required. Performs other duties as assigned by the Director of Engineering. Knowledge and Skills: Associates degree and two (2) years experience in broadcast engineering maintenance and operations required. Thorough knowledge of FCC rules, regulations, and operating standards required. Must have a working knowledge of audio and video server systems. Experience in RF transmission systems maintenance desired. FCC General license and/or SBE Certification desired. Available for 24-hour on-call. Experience in design, repair, assembly, and analysis of electronic systems that include analog, digital and/or high voltage. Send Resumes to: Human Resources, Public Broadcasting Atlanta, 740 Bismark Rd. NE, Atlanta, GA 30324. hr@pba.org fax: 678-553-3026.

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I. Type of Firm

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- ☐ D. Prod/post-prod studio
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- ☐ G. Network/group owner
- ☐ R. Broadcast consultant
- ☐ S. Mfg. dist. or dealer
- ☐ L. Corporate TV facility
- ☐ M. Medical TV facility
- ☐ N. Gov. TV facility
- ☐ P. Edu. TV facility
- ☐ Q. Record. studio
- ☐ K. Other (specify)

Purchasing Authority (check one only) ☐1. Recommend ☐2. Specify ☐3. Approve

II. Job Function

- ☐ A. Corporate mgt
- ☐ B. Engineering mgt
- ☐ C. Engineering staff
- ☐ D. Prod/oper mgt or staff
- ☐ E. News mgt or staff
- ☐ G. Training
- ☐ F. Other (specify)

WTS ❑ WTB ❑ Category: _____
Make: _____ Model: _____
Brief Description: _____
Price: _____

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Make: _____ Model: _____
Brief Description: _____
Price: _____

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*Listings close every other Wednesday for the following month's issue. All listings are run for one issue only.

Broadcast Equipment Exchange

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World Radio History

REFERENCE GUIDE

TRANSMITTING ANTENNAS

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

MANUFACTURER	MODEL	SHARED/ SINGLE CHAN.	POWER LIMIT	PATTERNS AVAILABLE	COMPUTER, SCALE MODELING	FEATURES	TYPICAL CONSTRUCTION TIME
Antenna Concepts Inc. 530-621-2015 *www.antennaconcepts.com*	Champion	Single channel	Variable	Multiple pattern options	Computer modeling available	Single input; DC grounded; lightning protection	12-18 weeks
Dielectric Communications 207-655-8100 *www.dielectric.com*	TFU-WB UHF Array	30 channel UHF	80 kW average for analog and/or digital service	Omni or directional	Computer/scale modeling or full-scale modeling available	Pylon loading characteristics with panel antenna bandwidth performance	120-150 days
Electronic Research Inc. 812-925-6000 *wwww.eriinc.com*	TRASAR	Single or adjacent channel UHF, single channel VHF	100 kW	Multiple azimuth and elevation patterns	Available	IP67 rated, pressurized, high power, top or side mounted	16 weeks
Jampro Antennas 916-383-1177 *www.jampro.com*	JUHD UHF Panel & JSL/JSH Prostar Slot	Multichannel, broadband	1-180 kW	10 standard patterns and custom	Computer modeling and full scale range testing	High power handling, broadband, light weight, low wind load	4-8 weeks
Kathrein Inc., Scala Div. 541-779-6500 *www.kathrein-scala.com*	771 304 Superturnstile	Broadband 470-860 MHz	4 kW DTV	Omnidirectional	Patterns are available for download online: in 19 formats	Full UHF band. Specify DT and NF Full fiberglass radome	6-10 weeks
Micro Communications 800-545-0608 *www.mcibroadcast.com*	UHF-955000 Series; VHF-AT13-000 Series	Multichannel UHF-470 to 860 MHz; VHF-174 to 216 MHz	Input power based on customer requirements	Multiple pattern options; custom patterns	Available	High power multichannel capacity; low ripple pattern; top, side and leg mounting	12-16 weeks
Propagation Systems Inc. 814-472-5540 *www.psibroadcast.com*	Digital Slot and Panel Antennas	Digital/analog multichannel operation	Up to 120 kW	Multiple pattern options	Modeling available for custom patterns	Digital/analog mode operation, low wind load, value priced	2-8 weeks
Radio Frequency Systems 203-630-3311 *www.rfsworld.com*	PHP UHF Panel Series and RD Slot Cavities Series	Multichannel	160 kW	Standard and/ or custom	Tower simulation effects on coverage pattern	Multichannel; high power; excellent coverage	8-10 weeks

ADVERTISERS INDEX

While every care is taken to ensure that these listings are accurate and complete TV Technology does not accept responsibility for omissions or errors.

PAGE	ADVERTISER	WEB SITE
21	360 Systems	www.360systems.com
35	AJA Video	www.aja.com
56	AJA Video	www.aja.com
42	Analog Way	www.analogway.com
26	Angenieux USA	www.angenieux.com
5	Avid Technology	www.avid.com
37	B&H Pro Audio	www.bhproaudio.com
67	B&H Pro Audio	www.bhproaudio.com
61	Belden Wire & Cable Company	www.belden.com
32	Bittree, Inc.	www.bittree.com
40	Boland Communications	www.bolandcom.com
55	Broadcast Store	www.broadcaststore.com
30	Burk Technology	www.burk.com
50	Canare Corp of America	www.canare.com
11	Canon - Broadcast Equip. Division	www.canonbroadcast.com
23	Canon U.S.A., Inc.	www.canondv.com
56	Compix Media Inc	www.compixmedia.com
38	Computer Modules - DVEO Division	www.dveo.com
56	Compuvideo Co., Ltd.	www.compuvideo.com
41	DMT USA, Inc.	www.dmtonline.us
49	Doremi Labs, Inc	www.doremilabs.com
56	DTV Exchange	www.dtvexchange.com
28	Electronics Research, Inc.	www.eriinc.com
39	Ensemble Designs	www.ensembledesigns.com
63	ESE	www.ese-web.com
53	Evertz Microsystems Ltd.	www.evertz.com
33	Focus Enhancements	www.focusinfo.com
59	For-A Corporation	www.for-a.com
62	Frezzolini Electronics	www.frezzi.com
20	Front Porch Digital	www.fpdigital.com
13	Harris	www.broadcast.harris.com
45	Harris	www.broadcast.harris.com
57	Hoodman Corporation	www.hoodmanusa.com
66	Iowa Public TV/Iowa DTV Symposium	www.iptv.org/dtv
58	K Tech Telecommunications, Inc	www.ktechtelecom.com
43	Linear Acoustic	www.linearacoustic.com
56	Link Electronics	www.linkelectronics.com
65	Lite Panels	www.litepanels.com
25	Logitek	www.logitekaudio.com
46	Marshall Electronics	www.mxlmics.com
15	Matrox Int'l	www.matrox.com
48	Media Links Inc	www.medialinks.com
12	Network Electronics	www.network-electronics.com
54	NTT Electronics Corporation	www.nel-america.com
17	Omneon Video Networks	www.omneon.com
31	Opticomm Corporation	www.opticomm.com
2	Panasonic Broadcast & TV Systems	www.panasonic.com/broadcast
57	Photogenic Professional Lighting	www.photogenicpro.com
65	Pineapple Technology, Inc.	www.ptibroadcast.com
16	Propagation Systems, Inc.	www.psibroadcast.com
29	Qustream Corporation	www.pesa.com
47	Radyne	www.radn.com
75	RF Central LLC	www.rfcentral.com
57	RF Central LLC	www.rfcentral.com
65	RF Central LLC	www.rfcentral.com
44	Riedel Communications	www.rfedel.net
52	S2ONE	www.s2one.com
56	Schneider Optics	www.schneideroptics.com
51	Screen Service BT S.P.A.	www.screen.it
9	Sony Broadcast & Professional Group	www.sony.com
1	Sony Broadcast & Professional Group	www.sony.com
60	StreamBox	www.streambox.com
18	TBC Consoles	www.tbcconsoles.com
24	Telestream, Inc.	www.telestream.net
36	Teranex/Silicon Optix	www.teranex.com
7	Thomson/Grass Valley	www.thomsongrassvalley.com
27	Troll Systems Inc.	www.trollsystems.com
19	TV ONe	www.tvone.com
22	Utah Scientific	www.utahscientific.com
14	Videoframe, Inc.	www.videoframesystems.com
57	V-Soft Communications	www.v-soft.com
34	Ward-Beck Systems	www.ward-beck.com
76	Wheatstone Corporation	www.wheatstone.com
65	Wireless Acquisition LLC	www.emceecom.com
65	Wireready	www.wireready.com
65	Wohler Technologies	www.wohler.com
57	Xintekvideo, Inc.	www.xintekvideo.com

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World Radio History

Vitec Acquires RF Central and Nucomm

LONDON

Vitec Group is aqcuiring RF Central and Nucomm. The U.K. camera-support concern agreed last month to pay up to $73 million for the American microwave link companies.

Under deal terms, Vitec will pay $38.5 million up front and another $37.3 million over the next four years depending upon performance. Factoring in $2.8 million in cash that Vitec nets in the deal brings the fully realized purchase price to $73 million.

Jerry Gepner, chief technology officer for Vitec, said the acquisition represents a natural progression for the company's collection of brands, which include Sachtler, Petrol, OConnor, Vinten, Anton Bauer, Drake, Manfrotto, Bogen Imaging, Bexel and several others.

"If you look at everything we do in broadcast; we do everything around the cameras—lighting... the communications. This is a perfect fit. This is around the camera. This is that link between the camera and somewhere else," he said.

RF Central makes transmitters and receivers for mobile coverage on live events like football games, marathons and the Olympics. The company also sets up and works the events. Nucomm is known for its fixed and mobile link gear for things like ENG and studio-to-transmitter links. Together, the two firms cover nearly every aspect of wireless connections for professional broadcast applications.

Gepner said that both companies would continue to operate as wholly owned subsidiaries. RF Central operations and its 50 or so employees will remain in Carlisle, Pa. Nucomm, which employs 95 people, will stay in Hackettstown, N.J. The former owners will remain as well. Jeff Winemiller, who formed RF Central out of Winemiller Communications four years ago, will stay on, as will Dr. John Payne, founder of Nucomm, and his son, John Payne IV.

"We're not changing any product numbers or nationalizing any product lines. There'll be a close marketing and technology relationship, but they will remain separate companies like all the other Vitec companies," Gepner said.

A third smaller company, Microwave Service Corp., is also included in the deal under an existing agreement to be acquired by RF Central. MSC is a microwave-link gear repair house in Haverhill, Mass.

According to information from Vitec, the two larger companies built up "significant inventories," in anticipation of the 2 GHz broadcast auxiliary service relocation being orchestrated by Sprint Nextel. Sprint Nextel prepaid these inventories, but until the gear leaves the warehouse, the payments are not recognized as sales under generally accepted accounting practices. Both companies consequently had substantial assets but showed a loss for 2006 because very little gear moved.

Nucomm had an estimated $36.2 million in gross assets and posted a loss before taxes of $5.8 million for the year. RF Central had assets of $24.4 million and lost $1.2 million before taxes.

Vitec said the companies' performance would improve as those inventories are delivered, as demonstrated by a 60 percent increase in their combined revenues for Q1 '07 compared to the same period a year ago. The companies together had $19.3 million in sales in 2006.

The 2 GHz relocation was initiated by the FCC in mid-2004, when it approved a plan to allow Nextel to move from its wireless service from the 700 and 800 bands into 2 GHz spectrum used by broadcasters for ENG. Nextel, later acquired by Sprint, was given three years to relocate broadcasters and replace ENG gear made obsolete by the move. In March, Sprint Nextel filed a progress report with the FCC saying it would need more time to complete the relocation because of several unforeseen obstacles.

Initially, there was a dispute over property tax liability, which was eventually settled by the Internal Revenue Service. Complications also arose because stations had to produce the gear they needed to replace; gear that was often in remote areas or fashioned from leftover parts in the shop.

By March, six months before the original deadline, Sprint Nextel had completed frequency relocation agreements with only 166 of 978 BAS licensees. The company in late May had FRAs with 313 licensees, according to a Sprint Nextel spokesman, who also said a formal request for an extension would be filed this summer.

The extension is expected to push the relocation deadline to 2009. Vitec said anticipated deliveries through 2009 would result in a "super-normal" trading outcome. After that, Gepner said Vitec would not likely unload either company.

"We buy companies for long-term value," he said. "Does the windfall help? Sure... but the fact of the matter is, that's not the enduring value. The move to HD, the move to IP radios, that's the enduring value."

Gepner said IP transport was expected to boom in the near future.

"The beauty is, you're talking about file-based transport," he said, "so everything we've seen in the nonlinear editing workflow, we'll see in transport. You stay file-based all the way through."

IP transport would also take the businesses beyond the broadcast market.

"Microwave will be an important part of things like WiMax; as telcos roll that out, the backhaul is still going to be microwave," Gepner said. "You still need this big pipe in the air. About the only thing you have for that is microwave. That's the stuff people are buying."

Emmis Sells KGMB-TV to HITV

INDIANAPOLIS

Media firm Emmis Communications Corp. has completed the sale of CBS affiliate KGMB-TV in Honolulu to HITV Operating Co. Inc. for $40 million in cash.

The sale includes KGMB's satellite stations, KGMV in Wailuku, Hawaii and KGMD in Hilo, Hawaii. HITV is a wholly owned portfolio company of MCG Capital Corp.

Since announcing its intent to exit the television business in May 2005, Emmis has sold 15 of its 16 television stations, resulting in gross proceeds of $1.18 billion. Emmis continues to own Fox affiliate WVUE-TV in New Orleans.

Emmis purchased KGMB-TV with seven other network-affiliated stations in October 2000 from Lee Enterprises.

Emmis owns domestic radio stations and a radio network, international radio stations, regional and specialty magazines, an interactive business and ancillary businesses in broadcast sales.

FFV Appoints New President

IRVINE, CALIF.

DVR innovator Fast Forward Video has appointed Hal J. Reisiger its new president and CEO.

Reisiger comes to Fast Forward Video from Enhanced Vision Systems, where he served as president for four years. Under his leadership, Enhanced Vision Systems' annual revenues more than tripled while winning accolades for new digital optical magnification systems for the legally blind and visually impaired. From 1999 to 2002, Reisiger was president of Burkert Contromatic, a U.S. subsidiary of Germany's Burkert GmbH & Co., a manufacturer of valves, sensors, and automation systems.

Reisiger began his career as an application engineer at Haskel International, a manufacturer of pumps, valves, and gas compressors. He went on to serve in several sales management positions at the company before being appointed vice president of operations.

"Hal's experience in taking companies to the next level in terms of manufacturing efficiency, global reach, and innovation is second to none and qualifies him superbly to take the helm as Fast Forward moves into a new and exciting stage of growth," said Paul De Keyser, founder of Fast Forward Video.

Reisiger will be based at Fast Forward's Irvine headquarters.

Canopus Founder Retires From Thomson

BEAVERTON, ORE.

Hiroshi Yamada is retiring from Thomson effective June 30, shifting from his operational role to a management advisory role. Yamada is currently the senior vice president of Desktop and Enterprise Solutions for Thomson's Broadcast and Professional Solutions business unit and leads its Japanese operations. Yasuo Suyama will take over responsibility for operations in Japan.

Yamada has seen the company through its integration into Thomson following the January 2006 acquisition. Now, confident in the BPS team, it's time to move on to his "happy retirement," Yamada said.

Yamada founded Canopus—the Japan-based developer of NLE software—in 1983 with its first product, an add-in Z80 CPU card to run in NEC's PC 98-series computers. Under Yamada's direction, Canopus became recognized for the advanced HD, DV, and MPEG codec technologies developed by the Canopus engineering team and featured in the company's real-time nonlinear video editing systems, transcoding products, and delivery systems.

"As the father of Canopus and its powerful line of desktop video editing, media conversion, and software codec products, Hiro has been a driving force in the industry—and in the acceleration of delivery of new Grass Valley products for the professional video solutions market as well as the post-production industry," said Jeff Rosica, senior vice president of the BPS unit. "Hiro's enthusiasm for, and expertise in, video and audio technologies and compression are second to none..."

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