FIBER OPTICS **JUMP BASE INSULATOR.** — Page 10

NewBay Media

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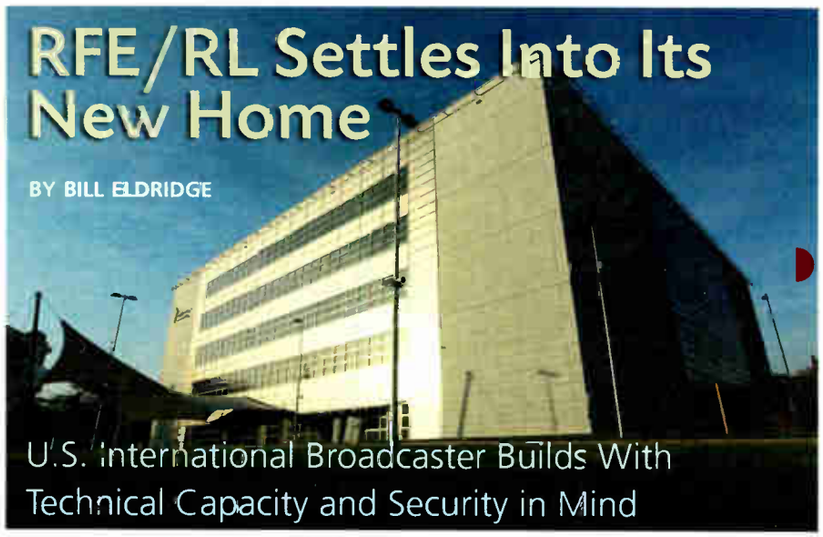
INSIDE



RFE/RL Settles Into Its New Home

BY BILL ELDRIDGE

U.S. International Broadcaster Builds With Technical Capacity and Security in Mind

FACILITYPROFILE

They say the difference between paradise and hell can be one mosquito.

When 9/11 hit, Radio Free Europe/Radio Liberty's beautiful location in the center of historic Prague turned into a logistics and security nightmare, both for the city and the organization. Eight long years later, RFE/RL has finally finished its move into its new facilities in Hagibor, not far from the city center, built from the ground up with technical capacity and security in mind, while its recent home, the former Czechoslovak communist parliament building, is being turned over to the National

(continued on page 18)

Photos courtesy RFE/RL

Left: RFE/RL President Jeffrey Gedmin greets Secretary of State Hillary Clinton, who serves on the Broadcasting Board of Governors and visited the new headquarters in April. 'You and the president frequently talk about soft power and smart power,' Gedmin said, 'so I think the first thing to say is: Welcome to smart radio, Radio Free Europe/Radio Liberty.'

Can Radio Get Noise Floor Issues Under Control?

Chuck Kelly Explores Impact of Man-Made Racket on AM/FM

WHITEPAPER

BY CHARLES W. KELLY JR.

Among technical presentations that grabbed the most interest at the most recent NAB Broadcast Engineering Conference was one by Chuck Kelly, director of sales for Nautel Ltd., about radio's noise floor. Here, Kelly provides a synopsis of his paper.

HALIFAX, NOVA SCOTIA — The proliferation of high-frequency devices in the home, workplace and car has led to a dramatic increase in noise floor levels to the detriment of AM and FM broadcasting.

Data about current noise levels, both theoretical and anecdotal, is available and can help broadcasters make changes to maintain their coverage area.

Noise in the radio frequency bands

(continued on page 6)

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Stations Go Green Without Seeing Red

Experts Share Their Experiences With LEED, Xeriscaping and Solar Power

BY TOM VERNON

You can improve your station's energy efficiency without incurring extraordinary expenses.

I moderated a panel on this topic at the spring NAB Show this year. "Going Green, Seeing Black" focused on some of the ways that broadcasters are becoming more environmentally aware.

Panelists included the founding principal of an international architecture firm, the general manager of a Salt Lake City public radio station and the director of engineering for two commercial AMs in San Francisco. Here are highlights.

GREEN BUILDINGS, PRACTICES

While many broadcasters want to go green and start out with solar panels or wind turbines, a sound environmental plan starts with tightening down the existing building.

This includes activities such as replacing over-rated HVAC units with properly-sized devices, use of thermal imaging to find gaps around windows and doors, and sealing them up, the use of motion sensors to control lighting and heat, and installing LED lighting and energy-efficient sprinkler heads for landscaping. Additionally, installing a "cool roof" can save over 30 percent on air conditioning costs.

The overarching principal is to look at the simple, boring solutions first. In many instances, so much money is saved through these measures that installing solar or wind may not be as pressing an issue, or the savings may make an installation more affordable.

Once you've addressed the basics, you can attend to long-term goals through strategic planning. This can include rainwater catchment systems for irrigation and cooling towers, installation of efficient toilets and faucets, building automation systems and providing green plants.

Rebates are available for many of these improvements, although most people don't know where to look or how to apply. Information on rebates usually is available from local utilities or NGOs. Green consultants are available in many areas to assist with the process.

Our audience members asked about funds that are available from the economic stimulus package. At this writing, little of this money is earmarked for improving commercial buildings.

Green business practices in operations can include activities such as rethinking paper procurement policies, where recycled materials are purchased from a local supplier, or for larger organizations, developing a paperless office.

Green employment practices can include benefits such as giving employees a half-day off to volunteer at an environmental cause of their choosing or donating money to a green cause of an employee's choice. Employees may be given bonuses for ideas that are adopted to reduce waste or improve energy efficiency.

BIG SAVINGS

Tony Argibay, AIA, founding principal of architecture firm Meridian Design, discussed LEED (Leadership in Energy and Environmental Design) certification and the importance of green building.

Key components of green building include site planning, water management, energy consumption, material use and indoor environmental quality.

LEED is a building certification system created by the U.S. Green Building Council. The ratings systems are developed by committees consisting of various practitioners in building and construction. Its goal is to transform the way buildings and communities are designed, built and operated, creating a healthy and prosperous environment that improves the quality of life.

Argibay emphasized that building green is important because of the amount of resources that buildings consume: 40 percent of the country's primary energy use, 72 percent of electricity consumption, 39 percent CO_2 emissions and 13 percent of potable water consumption.

A properly designed green building can reduce energy use by 24–50 percent, CO_2 emissions by 33–39 percent, water use by 40 percent and solid waste by 70 percent.

There are also human benefits to green buildings. Argibay added that research indicates a 2–16 percent increase in worker and student productivity.

'XERISCAPING'

Donna Land Maldonado, general manager of public station KRCL(FM) in Salt Lake City, described many of the environmentally friendly changes made to the station's property since it was purchased in 2000.

The grounds originally had traditional landscaping: grass, trees and shrubs. With an all-volunteer staff at the station, Maldonado feared the lawn wouldn't be taken care of. A decision was made to do a landscape makeover using "xeriscaping."

The term means water conservation through creative landscaping. Xeriscape is a registered trademark of Denver Water, which claims the benefits of xeriscaping include reduced water consumption, less landscape maintenance and reduced use of fertilizers and pesticides.

Community volunteers came to the site and removed the existing landscaping. Next, KRCL employed Waterwise Landscape Design, a local landscaping company, for the design and makeover. Waterwise located a nursery that was willing to donate native plants. Next, a

(continued on page 5)

AES Jumps Into the Stream

Fall Show in New York Also Features Historical Panel About RCA

Each year about this time I check in with David Bialik to see what he is planning for broadcast sessions at the Audio Engineering Society convention, to be held this fall in New York.

It'll be more than usually good to see him there, given that he was hospitalized and missed the San Francisco show. This is roughly equivalent to Noah missing a boat departure; it just doesn't happen.

(That didn't keep Bialik from doing his beloved AES work. He got more than 100 calls to his cell phone from attendees looking for room numbers and asking other convention questions. He answered using his notes and program materials. Many never realized he was 3,000 miles away in a hospital bed.)

A highlight this October will be a discussion of technical contributions of the Radio Corporation of America. If you think the letters RCA refer only to a connector, it's time to brush up on your history. Clifford Rogers, who was a sales manager for RCA Broadcast, and engineer Hans Dietza are among the speakers. Rogers is digging through boxes of old paperwork and told Bialik it's the most fun he's ever had. Fred Barnham of L3 Communications is co-organizing.

STREAMING

More in keeping with our times, two sessions will delve into aspects of streaming; indeed, the entire track now is called Broadcast/Media Streaming Sessions.

One will explore audio processing for Internet streaming. "You can't go into an office without finding at least one person listening. … It's *the* growing medium," Bialik said.

Awareness of the need for proper processing is growing, he believes, particularly given the range of hardware on which people might be listening, from cheap plastic speakers to high-end stuff.

Separately, Raymond Archie, director of streaming operations for CBS Radio, will moderate a discussion about streaming playback and distribution.

Encoding and stream delivery, Bialik says, are important factors affecting a distribution strategy, given the range of "connected" devices available including

> **'A lot of people** are listening to audio streaming now. … It's *the* growing medium.'

Internet radios, mobile phones and IP-enabled televisions, set-top boxes and mobile Linux devices, all of them potential "radios."

"A lot of people think, 'I'll set up a streaming server, and that's it," Bialik said. "But there are a lot of different ways to do playback; and you have to worry about how you're distributing your audio, about having enough bandwidth. As with a podcast, if you don't manage your distribution well you can overwhelm your system easily." Participants include speakers from Intel, Reciva, vTuner and StreamTheWorld (all panels are still being finalized).

A two-part session will explore digital audio networking. Neil Glassman will moderate a panel about the studio side that includes representatives of Axia, Harris, Logitek and Wheatstone. Then David Prentice of Dale Pro Audio heads a session on the use of IP audio beyond the studio including codecs and STLs. Representatives of APT, Comrex, Musicam USA, Source Elements and Telos Systems are among participants.

Radio World's Skip Pizzi will host a session on "Audio for Newsgathering" and talk with working professionals about current and future options for audio field recording and backhaul — as the AES marketing folks put it, "from EV-DO to BGAN, AMR-WB to HE-AAC, CF to SDHC."

FATIGUE

Listener fatigue and longevity will be taken up by a panel that includes Ellyn Sheffield, Andy Butler, JJ Johnston, Ted Ruscitti and Sam Berkow.

"It used to be a topic no one wanted to touch," Bialik said; but in fact radio has been trying to increase longevity for a long time, as hinted by a slogan well known to New York listeners: You give us 22 minutes, we'll give you the world.

"There was a time people would listen no matter how much noise and static was on the line. You'd listen to 'Mystery Theater' even if the reception was lousy. Now we're promising digital quality, clean sound; but we need to make the sound enjoyable and exciting."

The AES agenda includes a facility case study session, in which design and system integration specialists will scope out a hypothetical media environment and talk about variables like site selection, planning, construction, integration, acoustics, HVAC, furniture, equipment selection and aesthetics.

Other panels will discuss innovations in digital broadcasting; developments in mobile TV; the "lip sync issue," which has become more pronounced with today's huge TV screens; and loudness and audio processing for broadcast. Another will focus on sound effects.

For the first time, a Society of Broadcast Engineers Certification Exam session will be conducted at the convention. In the past, exams have been held in New York through SBE Chapter 15, which will help in administering this one. (AES registration, while recommended, is not required, nor is SBE membership. Info on exams is at *www.sbe.org*.)

Even in a challenging economy, Bialik believes engineers and managers should attend. "AES is *the* show if you care about audio and the art of producing and transmitting good audio to the public." Visit *www.aes.org/events/127*.

Bialik, meanwhile, is feeling fine after last year's car accident and health issues.

Ever the engineer, he puckishly has replaced most of the phones in his house with older rotary-dial models to cut down on his 11-year-old daughter's use of the phone. ("She and her friends sit around trying to figure out how to use them.")

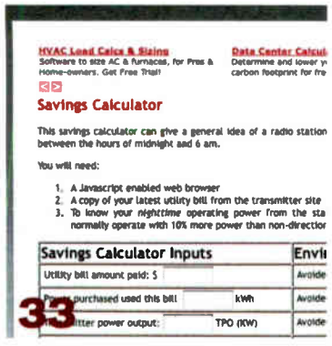
He also relates that in the course of last year's hospital stays, a health care worker asked what he thought his life expectancy might be. He said 78 years. Asked why, he replied: "I've lived up to every record speed so far, and that's the last one!"

FROM THE EDITOR

Paul McLane

THIS ISSUE

AUGUST 12, 2009



GREEN RADIO

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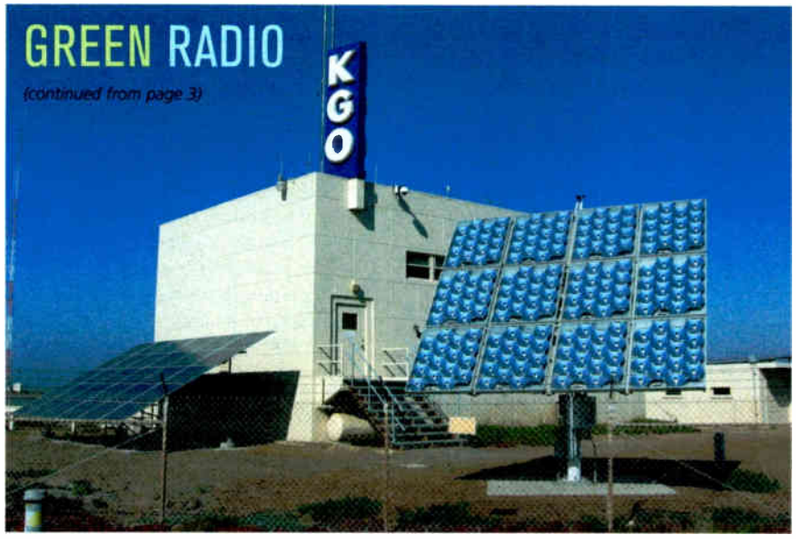

Joe Talbot described the solar power installation at KGO's transmitter site in San Francisco.

water-efficient drip irrigation system was installed. The final piece was the transplanting of a bristlecone pine. The project cost around $2,000 in 2000.

KRCL partnered with Utah Power's Blue Sky Initiative and began purchasing electricity from wind power. Over the past four years, the station has increased its purchases until they are now at 100 percent.

Maldonado said that when the building was purchased, it had an unreliable generator system. This was replaced with a solar power backup system. The panels are constantly online, reducing KRCL's demand from the grid. At the same time, the panels power 10 batteries, which allow the station to broadcast for 12 hours in the event of a prolonged power outage.

Existing lighting fixtures in the KRCL building have been replaced with energy-efficient devices. The station took advantage of a rebate program available through Utah Power's FinAnswer, resulting in a savings of 57 percent.

Maldonado adds that the station has installed a bike rack to encourage pedal power. It recycles paper and airs numerous public affairs programs and public service announcements for green causes. The next step for KRCL is installation of low-flow toilets and waterless urinals.

KNOW YOUR DEALER

Joe Talbot, director of engineering at Citadel's KGO(AM) and KSFO(AM) in San Francisco, talked about the installation of a 20 kW solar power installation at the KGO transmitter site on the south end of the San Francisco Bay. The project was a partnership with PG&E, which pointed the station to vendors, rebates and tax credits.

Several issues came up during the planning process, he said.

City planners expressed concerns that reflections from the solar panels would blind drivers on a nearby freeway. The station showed that this could not happen. There was a requirement for soil samples to be analyzed. The results came back with high salinity — not surprising since the site is in a salt marsh. These delays put construction into the rainy season, which resulted in more delays.

The project finally worked. KGO invited Speaker of the House Nancy Pelosi to the dedication and the California Democrat threw the switch to inaugurate the solar project.

Talbot noted that an important part of the project was getting the word out on solar power. KGO aired a series of special reports on solar power, including information on rebates and tax credits that were available through PG&E. It also maintained a blog on the station Web site to keep listeners informed as the project progressed.

Talbot's advice to stations contemplating renewable energy is simple. "Get to know your local wind and solar dealers. They know what is available in your area and what works best."

The author is principal at Interactive Media Concepts and a regular Radio World contributor. Read more "Green Radio" articles under the Columns tab at radioworld.com.

NOISE FLOOR

(continued from page 1)

has been with us since the beginning of broadcasting. There are reports of Marconi complaining about ignition noise from early cars.

While natural sources of noise, including atmospheric noise and cosmic noise, have remained relatively stable over the last century, man-made noise has increased due to the proliferation of unintentional radiators such as microprocessor controlled devices, fluorescent lighting, RF lighting, dimmers, switched-mode power supplies and remote-control devices.

NOISE SOURCES

Radio noise comes from a variety of sources, both man-made and natural, and the intensity varies on both a time-of-day as well as a seasonal basis. Frequency distribution also depends on the noise type.

The main two kinds of natural noise sources are atmospheric and thermal. Lightning is the primary atmospheric noise source and varies due to the proximity to storms and the time of the year. The noise amplitude caused declines of roughly 50 dB per frequency decade from 10 kHz to 10 MHz.

Atmospheric noise is the dominant natural noise source in the AM band. Atmospheric noise is more problematic at night because distant lightning storms can propagate long distances via skywave.

The thermal agitation of electrons causes thermal noise, also known as Johnson-Nyquist noise. Thermal noise is roughly linear with respect to frequency. Because atmospheric noise declines so dramatically with frequency, thermal noise is the dominant natural noise source on the FM broadcast band.

MAN-MADE NOISE

Six broad categories of man-made noise exist: power lines, light dimmers, microprocessors and high-speed digital circuity, touch-control lamps, broadband over power lines and co-channel or adjacent stations.

Arcing across power line equipment often causes *power line noise*. Such noise declines in amplitude with frequency and typically is more troublesome in rainy and windy conditions.

Power line noise affects AM and FM but is most often noticed on AM because the recognizable buzz is demodulated in an AM receiver more readily than on FM. Power line noise is carried and radiated by the high-tension lines, compounding the problem.

Light dimmers made for home use incorporate thyristor devices that switch the AC line voltage with a very fast rise time. Unless effective filtering is used, these fast rise times can cause ringing that creates interference primarily in the AM band. Again, the AC power distribution serves as the antenna for the noise.

Huge advancements have been made in the speeds of computers, while at the same time there has been significant growth in the number of *microprocessors and high-speed digital circuitry* in so many other devices in regular household use. Since these devices include clocks ranging from a few kilohertz to hundreds of megahertz, even when effective shielding and filtering are used the cumulative effect raises the noise floor in the home, office and automotive environment.

The noise generated by high-speed logic has caused serious problems in AM and FM receiver design. Controllers used for receiver displays as well as decoding of digital radio modes create signals that are picked up by the adjacent receiver front-end circuitry, limiting the effective sensitivity of the receiver.

In the past few years, inexpensive *touch-control lamps* for the home have become available. These lamps may be switched on and off, or through a range of brightness levels, by touching a capacitive plate.

Touch lamps generally contain a free-running oscillator that changes frequency when the plate is touched. Unfortunately, these oscillators are also rich in harmonics and can radiate a wide frequency range.

In an effort to bring high-speed Internet access cost-effectively to a wide geographic area, some power companies have implemented technology in which high-frequency radio signals are carried on power lines. U.S. *broadband over power line* implementations have been limited to roughly 1.7 MHz to 80 MHz, according to the National Telecommunications and Information Administration, and would thus be limited to the spectrum between the AM and FM bands. However, this is not always the case internationally, and BPL is a significant source of noise to radio broadcasters.

Co-channel or adjacent stations are a source of man-made noise. The population of radio stations worldwide has multiplied several times in the past 20 years on both the AM and FM bands, as new services are authorized by governing bodies.

In the United States, in just the last decade, 2,000 more stations have gone on the air, according to the Radio World article "Number of Licensed Radio Stations Grows," March 21, 2008. There are now a total of 14,253 AM and FM stations on the air, plus 851 LPFMs and 6,120 translators and boosters as of December 2008, according to the FCC, the latest information available.

NOISE DISTRIBUTION BY LOCATION

Rural areas suffer the least with noise, and increasing levels of development have a correspondingly higher average noise level.

For example, from a National Telecommunications and Information Administration study in 1974, areas defined as "business" showed about 4 dB greater average noise, regardless of frequency, than did "residential" areas.

Similarly, "residential" noise levels averaged 6 dB noisier than "rural" levels, which in turn were 16 dB noisier than "quiet rural" areas. Thus, if it can be assumed that "quiet rural" areas were limited primarily by atmospheric noise, the noise levels at the "business" areas was 26 dB higher, and a result of man-made noise sources.

From values reported in an International Telecommunication Union study,

(continued on page 8)

NOISE FLOOR LEVELS CAN AFFECT IBOC COVERAGE

Increasing noise floor levels affect more than just analog radio coverage.

Some evidence suggests that the current "–10 dB" debate is related not just to building penetration or terrain shielding but to the relationship of the attenuated HD Radio carriers to the noise floor in various noise environments. In industrialized areas with a high noise level, a higher HD injection level may be needed to allow the HD sidebands to be demodulated reliably, while in rural or quiet rural environments, a –20 dB injection level may provide approximate parity coverage with analog.

Accordingly, each broadcaster needs to evaluate the noise environment at the periphery of its analog coverage area. If most of the peripheral coverage is low noise, perhaps –20 dB HD injection may suffice, but if much of that peripheral coverage is industrialized and noisy, a higher injection level may be called for.

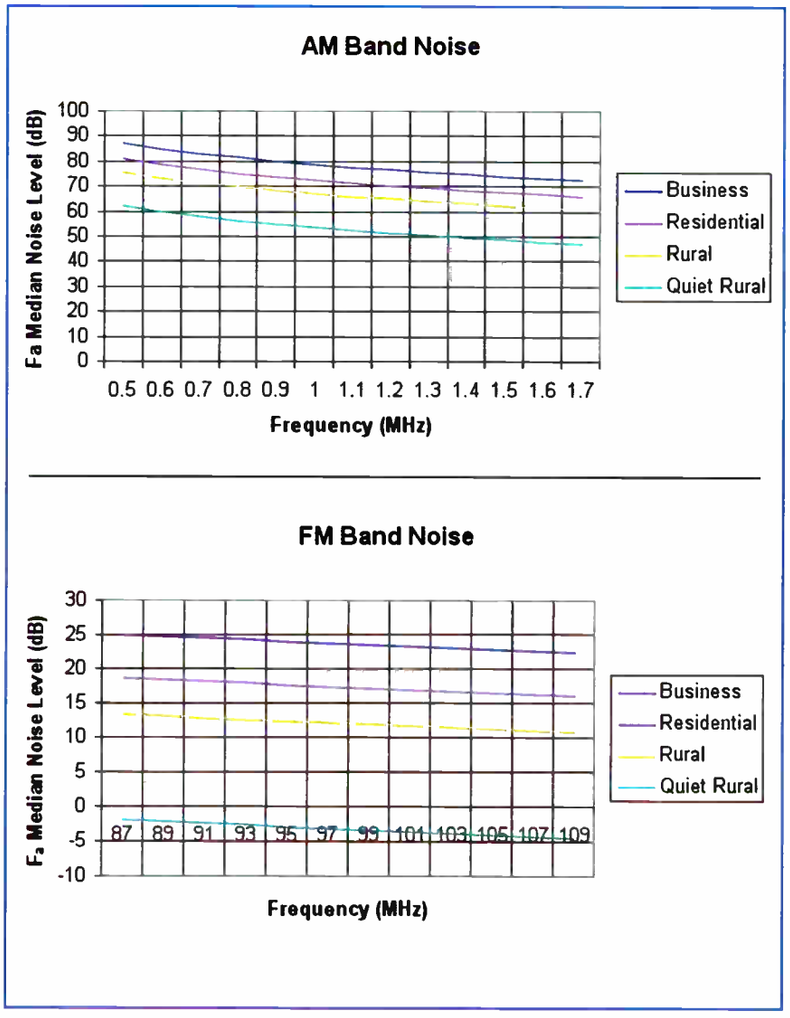

Fig. 1: Band noise by location.

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NOISE FLOOR

(continued from page 6)

graphs can be derived that depict average noise levels in the AM and FM broadcast bands.

These estimates do not include intentional man-made noise, such as new stations. In addition, where the population is moving from rural areas to residential or business environments, the noise level will increase accordingly.

CHANGES IN AM/FM NOISE LEVELS OVER TIME

Several studies have been done with disparate results in ambient noise levels today. It's challenging to compare measurements made a decade or more ago as methodology and test setups are difficult to duplicate accurately.

An NTIA study in 2001 indicated that VHF man-made noise had remained constant relative to measurements in business areas that were essentially unchanged and the residential noise levels had actually declined.

On the other hand, anecdotal information from listeners and broadcasters alike attest to station coverage being limited by increases in man-made noise levels.

AM stations that were once routinely audible at great distances can no longer be heard beyond their local coverage areas.

Note that the NTIA and ITU studies identify primarily unintentional radiators; as a result, the effect of the growth of AM and FM radio stations would not be reflected in these studies.

Nearly a decade ago, the privatization of radio had yet to occur in India, and the author had the opportunity to run some unscientific measurements of the AM and FM spectrum in some of the major cities. Listening to the AM bands was much like the spectrum looks, silence from end to end, with just a few stations audible. On FM, there was noise on the top half of the band, and just one or two stations.

Increased levels of noise have a very predictable effect on coverage areas. In the example shown from a Class A FM in Illinois, we see the effect of a 16 dB increase in the noise floor on an FM station. In this example, the coverage area is reduced by 71 percent.

POSSIBLE SOLUTIONS

Noise level increases are often gradual and may not be noticed day to day. Radio broadcasters who are affected have a number of choices in handling the reduction in coverage, depending on local regulatory conditions:

- Consider changes to the transmitter location, power and antenna gain, height and directivity to provide higher signal strength over the areas most affected by increased noise;
- Investigate boosters on the same frequency to reach areas geographically separated or which have terrain shielding; and
- Look into translators that can provide targeted coverage in key areas.

The increase in urbanization, the proliferation of unintentional radiators of man-made noise and the increase of the number of AM and FM stations worldwide are having an effect on the coverage areas of radio stations. Those stations that went on the air 10 years ago or more may be experiencing a reduced coverage area.

The author thanks Tim Hardy of Nautel and Ed Hare of the American Radio Relay League for their assistance.

Comment on this or any article. Write to radioworld@nbmedia.com.

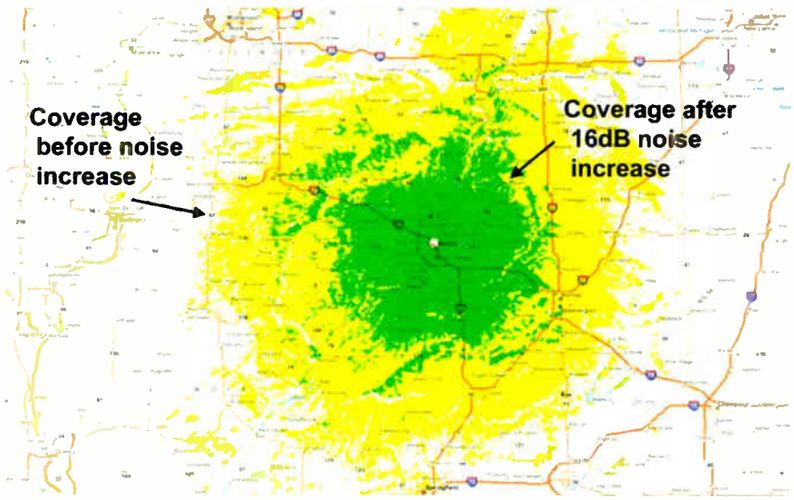


Fig. 2: The effect of increased noise levels on coverage. Shown: This Class A (3 kW ERP) FM's 34 dBu/V coverage is reduced by 71% with a 16 dB noise floor increase.

NEWSWATCH

THE FCC INN IS FULL

WASHINGTON — The Federal Communications Commission is back to full strength with the addition of Meredith Attwell Baker and Mignon Clyburn.

Clyburn, a Democrat, is a South Carolina utility commissioner and former newspaper publisher. She's daughter of House Majority Whip James Clyburn, D-S.C. Baker is a Republican who until January led NTIA's DTV converter-box coupon program and was acting head of the agency. She's daughter-in-law of former Secretary of State James Baker. Baker is fulfilling the unexpired term of former FCC Chairman Kevin Martin, which runs through June 30, 2011. Clyburn gets a full five-year term, taking the seat vacated by former Commissioner Deborah Taylor Tate.

NEWS ROUNDUP

FCC REFORM: Chairman Julius Genachowski said commission reform is "a matter of great urgency." He has been meeting with managers in the bureaus and offices to hear ideas for re-tooling. The commission now has an internal Web site to solicit proposals from employees; he pledged that the site, *reboot.fcc.gov*, would become public at some point. Commissioner Robert McDowell proposed the agency fill more positions with non-attorneys. Engineers could investigate complaints and petitions that involve technical and engineering questions, he said.

DONATED AMs: Clear Channel Radio donated four silent AM stations to the Minority Media and Telecommunications Council, which will use them to give minorities and women a boost up the ownership ladder. The stations are KYHN, Fort Smith, Ark.; WTFX, Winchester, Va.; KMFX, Rochester, Minn. and WHJA, Laurel, Miss.

WIDEORBIT, GOOGLE: Online ad and media management software firm WideOrbit is planning to buy the assets of Google Radio. Google Radio's Jim Woods told customers in a July e-mail that Google and WideOrbit were in final contract negotiations for Google Radio Automation, including its SS32 and Maestro product lines. Officials at both WideOrbit and Google declined comment.

'PPM GEN 2' COMING IN 2010?

Arbitron is targeting the first quarter of next year to field-test its "PPM Gen 2," a smaller, sleeker PPM device. It hopes to introduce a software-only version in 2011.At its recent briefing about June PPM numbers, executives said that based on input from 18- to 34-year-old meter-wearing panelists, the company had been working to improve the design.

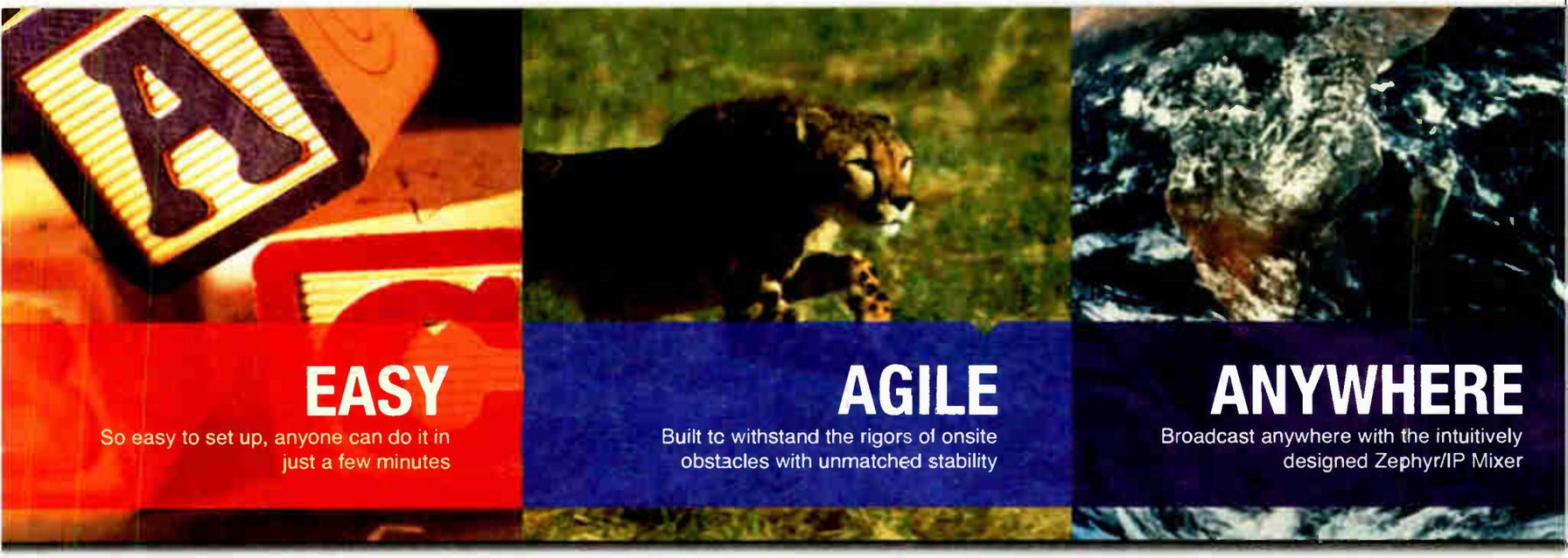
The batteries on the current "PPM 10" and "PPM 14" now in the market last 28 to 30 hours and up to 60 hours respectively before needing a charge. Currently a mix of those meters is used in the PPM markets. The longer-lasting battery PPMs were introduced in 2008. Households with younger people are more likely to get the meters with the longer-lasting batteries, Arbitron told me, while households of 55+ members get the PPM 10s. The meters look identical.

One of the things dogging the perception of PPM among those who wear it (and those who don't) is its "pager" look, stemming from its early 1990s design. I've talked with Arbitron executives before about their plans to get creative with the meter design, like using skins, much like other personal digital devices.

During discussion of its financial numbers in July, President/CEO Michael Skarzynski said the company plans a software-only version of PPM in 2011. CFO Sean Creamer said cell phones are not the only option for the new software, which will be "device-agnostic." Arbitron isn't convinced smart phones are the best research tool, he said, citing penetration as one criterion the company would use to decide whether to place PPM software on cell phones. Tech patents come into play also, depending on whether Arbitron has patentable technology or whether it would have to rely on others, he said.

Any change in methodology would have to go through the Media Rating Council accreditation process, lengthening the cycle time, Skarzynski noted.

The discussions by Arbitron officials about the next-gen PPM are noteworthy as the first public discourse of meter R&D under Skarzynski, a techie with an electrical engineering degree.



Locks In Your IP Connection Where Others Fail

Engineered to use public IP networks and mobile phone data services, the Z/IP Mixer combines the excellent performance of the original Zephyr/IP with the convenience of a digital four-channel stereo mixer. Designed to deliver high-quality audio transmission with low delay, even over less than perfect networks. Enclosed in a road-ready portable chassis, built to go wherever the action is.

Z/IPMIXER: Lock it in.

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Fiber Optics Jump Hot Base Insulator

When contract engineer Stephen Schuh replaced two old AM sites by diplexing the stations, he was required to use strobe lights, both night and day, due to bird flyway considerations. The new site is a quarter-mile from the Mississippi River.

WORKBENCH
by John Bisset
Read more Workbench articles online at radioworld.com

Stephen used an Austin ring transformer to get the AC onto the tower to run the three strobe control systems; but he was left to develop a solution to get the alarm monitor signal off of the energized AM tower.

He found an inexpensive and easy method thanks to Digikey and a company called Industrial Fiber Optics Inc., which makes fiber optic LED encoders and fiber optic photo logic detectors as shown in Fig. 1. The pair is designed to mate with standard 1000 μm core jacketed plastic fiber optic cable.

These small plastic devices have a "connector-less" design that allows you to cut the fiber and insert it into a captive plastic housing that locks the fiber by means of a cinch nut. Gone is the tedious and expensive splicing of fiber optic cable.

In this case, Steve just needed the equipment to provide a simple on/off indication to alarm the remote control; but these devices also can be used for reasonably priced digital data links. You might find them useful if you need to transfer a signal and need EMC/EMI signal isolation.

The cost of the LED, detector and 30 feet of fiber was $30. As seen in Fig. 2, there are few extra parts required other than power supplies to assemble the devices.

Stephen used the normally closed (NC) alarm contacts on the Flash Technology controllers to keep the LED on and provide a failsafe supervised system.

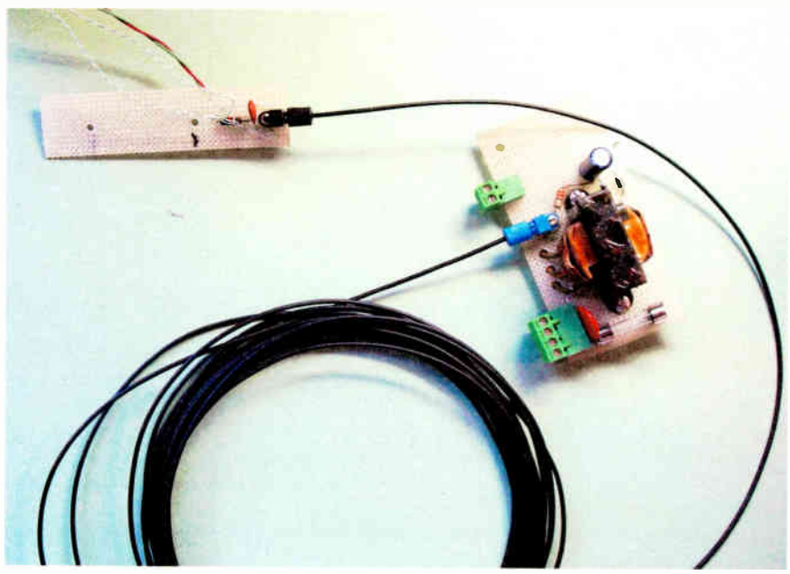
Check out the encoder/detector at *www.i-fiberoptics.com*. To order the parts, Digikey's site is *www.digikey.com*.

Thanks, Steve, for an inexpensive solution to a troubling issue for AM engineers with strobe systems on hot towers.

Steve's been operating Schuh Electronics for about 30 years. He is a Minnesota licensed technology contractor, working mostly in the North Star state but also in Iowa and Wisconsin. His site is *www.schuhelectronics.com*. When you go to his site, click on "My Shop." It is housed at the old KWNO transmitter building in Winona. The building and tower date to 1948.

Stephen Schuh can be reached at *sschuh@hbci.com*.

Left: Fig. 1: A simple fiber optic encoder/decoder gets an alarm across an AM tower base insulator.



Below: Fig. 2: The encoder/detector is installed using 'connector-less' fiber optic cable. Custom-length cabling becomes a breeze.

You can find great engineering consultants in the Broadcast Equipment Exchange classified section of Radio World. Just look under "Consultants."

I've often recommended professional consulting engineer Web sites as a source for reference information. After reading the June 3 *Workbench*, in which we described the use of a Potomac FIM21/41 for finding ground radials, engineer Jim Liffrig, transmitter supervisor for KRVN(AM) in Nebraska, shared a site you should bookmark.

Go to Hatfield & Dawson at *www.hatdaw.com*, click on "Downloads" and scroll almost to the bottom of the page to "Use of FIM 21/41 for location of ground radials."

One suggestion includes a picture that shows a handle with a 1/4-20 bolt in the end. The handle screws into the bottom of the meter so you can hold the device upside down, close to the ground, as you sense radials. If you've checked radials by just holding the meter, you can appreciate that this is an excellent addition that can save your back.

Jim used the screw-on handle from an old RF knife switch that had been decommissioned long ago and was sitting in his junk box. Problem solved. The drawings also show a method to

(continued on page 12)

Don't let the **hole** in your budget hold you back...

Reduced equipment budgets don't have to mean the end of your IP Audio projects this year. Logitek's JetStream Mini gives you the flexibility you need for audio routing, distribution and mixing – for about a third of the price you've come to expect. Everything you need is provided in one user-configurable 64-channel node, and we offer the latest networking protocols to make your implementation fast and easy.

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JETSTREAM MINI

Call us at 800.231.5870 or check out JetStream IP Audio routing solutions at logitekaudio.com today!

Logitek
Console Router Systems

WORKBENCH

(continued from page 10)

desensitize the meter for high RF fields.

Jim Liffrig can be reached at *jliffrig@krvn.com.*

Similarly, if you haven't visited FCCInfo.com, created by Cavell Mertz & Associates, you're in for a treat. This database has been around for eight years and shows up-to-date FCC broadcast, microwave and tower structure information.

The databases now have been combined with mapping capabilities of Google Earth. A 3D display of both building and terrain offers a unique perspective of viewing FCC data. Fig. 3 shows the 7 GHz fixed microwave sites at the Sutro Tower in central San Francisco. Fig. 4 shows a composite of radio and television facilities in Washington and, to the lower left, facilities in Arlington, Va.

Since 1989, the firm has been providing consulting, mapping and data services to the telecommunications industry. Its main site is *www.cavellmertz.com.*

Based on the above items, it's obvious that we engineers have a lot of resources at our disposal.

Most of us have used basic electronic programs for finding transmission line loss or calculating resistor pads at some point in their careers. What you probably don't know is that a good number of these programs were developed by the late Steve Schott.

Steve started developing the programs when he worked for Collins Radio and he improved on them during his stints at Harris, BE and, most recently, Continental. Steve never sought notoriety or compensation; it was simply his way of giving back to an industry that had been so good to him.

He was known for his friendly smile and he was always helpful, not only to his customers but also his coworkers. He was one of the most unpretentious guys I've ever known. There are lots of great stories about Steve, who flew gliders, sailed, enjoyed scuba diving and was president of the Texas Old English Sheepdog Rescue Organization.

At a national sales meeting a few companies back, Steve and I were sitting with a couple of middle managers who were bragging about their expensive Cartier and Montblanc pens.

"I bought mine at Tiffany and it cost $300," one said.

"I picked mine out at the Montblanc store in Chicago for nearly $500," replied the other.

Steve pulled a ballpoint pen out of his shirt pocket, clicked it and said with a chuckle, "I got mine free, from Tony's Tire and Auto."

This down-to-earth guy died on May 28. His formula CDs continue to help engineers. What a neat legacy.

John Bisset has worked as a chief engineer and contract engineer for 39 years. He is international sales manager for Europe and Southern Africa for Nautel. In 2007 he received the SBE's Educator of the Year Award. Reach him at johnbisset@myfairpoint.net. *Faxed submissions can be sent to (603) 472-4944.*

Submissions for this column are encouraged and qualify for SBE recertification credit.

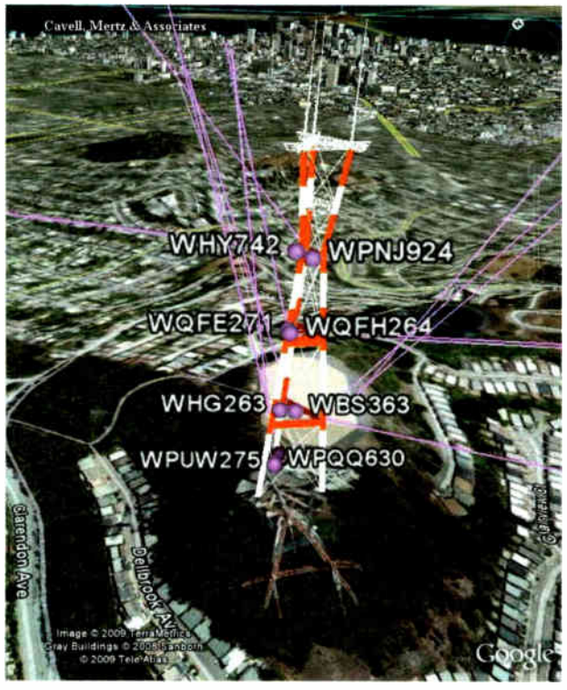

Fig. 3: The marriage of data with Google Earth offers a unique interpretation of the 7 GHz links at San Francisco's Sutro tower, courtesy of Cavell, Mertz & Associates.

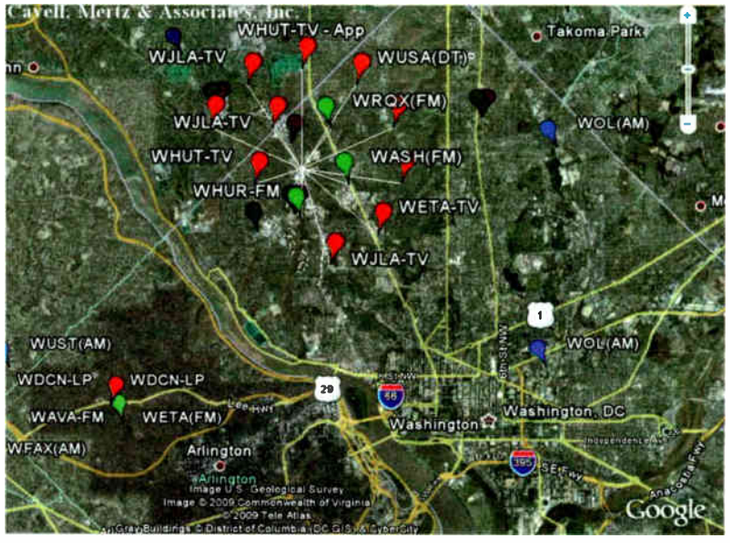

Fig. 4: From FCCInfo, here's a composite showing radio and television sites in the nation's capital.

ANY WAY YOU SAY IT, IT'S RADIO

The graphic at left appeared in our Aug. 1 issue as an accompaniment to a column by Skip Pizzi. It shows the word "radio" in numerous languages. How many can you identify? The answers are at right.

ONE

EVERYBODY WANTS ONE!

The ONE processor that can adapt to any application, the Omnia ONE is designed as a "universal hardware platform." Using the latest and most powerful DSP hardware architecture, the Omnia ONE platform can handle and adapt to the demands of both traditional and digital broadcasting through simple software downloads. No wonder it's the most successful product introduction in Omnia history! Available in AM, FM, Multicast, and Studio Pro versions.

6EXi

FIRST CHOICE OF MAJOR-MARKET BROADCASTERS WORLDWIDE.

When we first introduced Omnia-6, it set the industry pundits back on their heels. 96kHz sampling/24-bit resolution? Very cool! Five bands of AGC? Six bands of limiting? Unheard of! So much power it was amazing. As it turns out, the powerful, musical, natural sound of Omnia-6 was just what broadcasters were waiting for. Omnia-6EX and 6EXi became, and remain, the in-demand processors at major-market stations around the globe.

OMNIA PROCESSING

5EX HD+FM

No matter what your transmission method, Omnia 5EX HD+FM provides what no other can: The competition-crushing, market-dominating, accept-no-substitutes Omnia sound – sound so pure, clean and compelling that it's almost an unfair advantage.

5EX HD+AM

Here is the reason why more of the world's powerhouse AM radio stations have turned to Omnia processing. More clarity, more presence, more power, more flexibility. AM radio never sounded so good.

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The power of eight discrete, three-band stereo Omnia processors in a single, networked box.

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Dramatically improve the sound of your streams with the power, punch and purity of Omnia A/X processing for your audio workstation.

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Radio's Part in the 'Smart Grid'

RDS Has Been Targeted to Play a Key Role In Improving Our Energy Efficiency

THE BIG PICTURE

Skip Pizzi

You've probably heard a little (or maybe more) about the "Smart Grid" — a general term for various methods of making our energy distribution systems more adaptive and flexible, thereby conserving energy through reduced waste and more efficient consumption patterns.

What you might not have heard is the critical role FM radio broadcasting may soon play in this space.

Let's start with an overview.

Our current power distribution system is essentially a one-way environment — it is designed to deliver power from source to load, and does so in a fairly effective and reliable manner.

But this distribution could be much more efficient and even more reliable if it had an integrated, two-way "backchannel" for monitoring and controlling the distribution in a more adaptive and granular manner.

The Smart Grid adds just such a mechanism through the addition of multiple return and control paths layered atop the existing power-distribution network.

This is not an entirely new idea; electric utilities have had it in mind almost since their beginnings, but its broad application has been elusive.

> **Studies** have concluded that distribution via FM-RDS is perhaps most advantageous.

Today's technology and generally heightened awareness of the need for such energy efficiencies may finally bring the concept to fruition, however, and the Smart Grid is the culmination of that process worldwide.

One of the central components of the Smart Grid is the ability for utilities to control thier customers' usage of electricity during periods of peak demand. Given adequate control, utilities could avoid forced service outages during such crises. Meanwhile, loads could also be managed more efficiently and overall consumption substantially reduced, along with other benefits.

While this may have a real "big brother" ring to it, most proposals would allow consumers to voluntarily opt-in or out of these programs. There are also proposals to allow tiered electricity pricing during different dayparts, so consumers could defer certain power-consuming activities (e.g., laundry or dishwashing) to times when power costs are cheaper. And some elements simply involve messaging that informs consumers of current conditions and encourages appropriate behavior, with no direct device control.

Radio Thermostat makes 'communicating thermostats' that support various types of communication required by system integrators — RDS as well as ZigBee, Z-Wave, WiFi and 6LoWPAN.

GETTING THERE

A number of methods have been proposed for distribution of such control signals from utilities to their customers.

Various studies have concluded that distribution via FM-RDS is perhaps most advantageous for this application, given its wide existing deployment, good building penetration, service robustness, low delivery and consumer-equipment cost, and its likelihood of remaining around and unchanged for a considerable period of time.

Another benefit of RDS distribution arises from the fact that FM stations' coverage in a market typically are well matched to the service area of that market's electric utilities. This offers a form of coarse addressability inherent to the terrestrial propagation footprint of FM stations (more on addressability below).

Given that the FM-RDS delivery path is already well established, what's needed to get this concept working are elements on both ends of the path.

At the head end, an entity would be set up to collect messages and commands from one or more utilities, verify and code them securely, and deliver them to the appropriate radio stations' RBDS encoders — where they would most likely be inserted as RDS Open Data Application (ODA) content.

At the receive end, consumer homes will need to be equipped with power-consuming/controlling devices that include FM-RDS receivers and associated user interfaces. Development on both of these processes is already well underway.

THE UPSTREAM PART

A number of entities and initiatives have coalesced in recent times in this space (particularly in California, where Smart Grid regulatory processes are farthest along), including one formed by some former broadcasters and RDS experts called e-Radio USA, or ERU.

The company is signing deals with various utilities, and plans to contract with FM broadcasters in these utilities' service areas to obtain access to adequate RDS bandwidth. (One or more stations might be used in each market.) ERU would provide, install and maintain the necessary equipment at radio stations, coordinating with station technical staff.

ERU has developed a format for its RDS-delivered control data that it calls Utility Message Channel (UMC). It includes data fields for identifying multiple utilities, device types and locations. Such data could be used to target consumers' homes in specific zones within the station's coverage area, or only target certain devices. Ultimately, ERU plans addressability down to the individual device.

As is expected of most such entities, ERU's scope is end-to-end, thus it also designs the RDS receiver modules that would be installed by device or appliance manufacturers to enable response to utilities' UMC control signals.

THE DOWNSTREAM PART

The devices envisioned at the consumer end include the Programmable Communicating Thermostat (PCT), device switches, smart appliances, message-display terminals, and even smart chargers for hybrid vehicles.

RDS is not the only method proposed for communicating with these devices, however. A number of involved companies have therefore formed the U-SNAP Alliance, which will provide a standard interface for PCTs and other home automation devices, allowing plug-in of various receiver modules to respond to utility control signals, whether they are delivered by RDS or other methods like WiFi or Ethernet, including some other proprietary networking formats already developed for such control (such as ZigBee, Z-Wave or FlexNet).

The PCT reference design that ERU proposes would have a non-removable ("mandatory") RDS receiver plus a U-SNAP port for addition or later upgrade to another delivery method. ERU's receiver also allows firmware upgrades to be delivered over the air.

Beyond PCTs, device switches would be attached to specific, high power-consuming equipment such as air conditioners or hot-water heaters. These would allow a utility to control the use of such units via RDS or other message-delivery paths, so that during emergency periods, loads could be rebalanced by temporarily shutting down only these devices, and not resorting to "rolling blackouts" that turn off *all* electric power in a given area.

Meanwhile, smart appliances would allow consumers to program their use to respond to tiered pricing or other offers by utilities, again communicated to the appliances via RDS or other pathways. Finally, a simple message display terminal could also be addressed by utilities, to alert and advise consumers regarding energy usage during critical periods.

The use of RDS for utility load management in the Smart Grid seems like a win-win, allowing broadcasters to provide valuable new service, while collecting some new revenue for minimal effort. Stay tuned to companies like ERU and others for further development in this area.

Skip Pizzi is contributing editor of Radio World.


More than 1,500 IP-Audio consoles so far.
We're at a loss for words. Thankfully, we've got pictures.
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PowerStation: the new console system from Axia.

COOL STUFF AWARD Radio World 2009

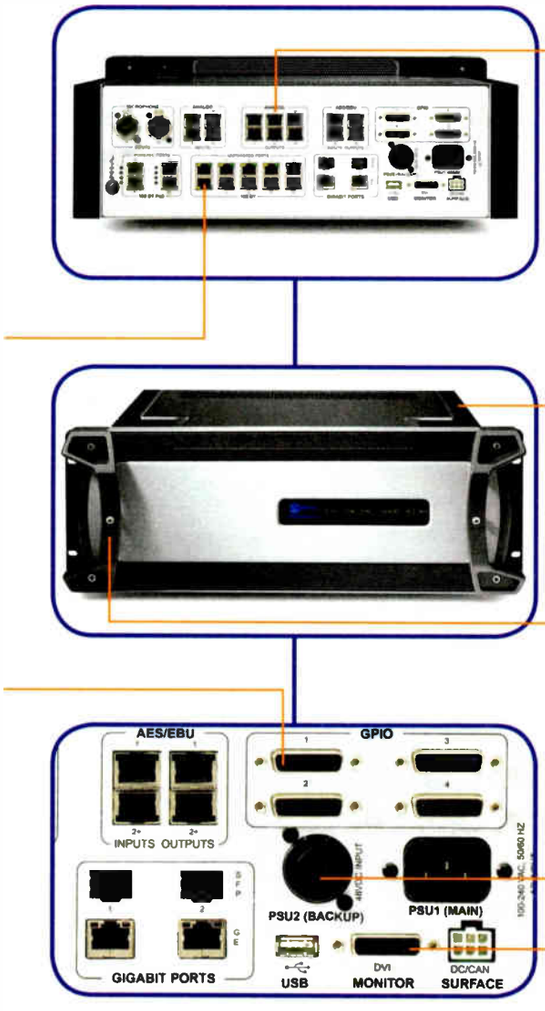
Because there's no such thing as too much uptime.

All stops removed • Twenty years from now, you'll have forgotten this ad. But you'll still have your PowerStation, the full-featured one-box IP-Audio console/router system hardened with **industrial-grade components** and redundant power capabilities. Tough enough to take a football to the groin and keep on going. PowerStation **minimizes setup** and **maximizes "bang for the buck."** Engineered without compromise for broadcasting without interruption.

Easy as π • PowerStation combines a console DSP engine with audio and logic and a network switch, **all in one box.** As its name implies, there's a whole lot o' muscle inside that burly frame, but that doesn't mean it's complicated. In fact, setting up PowerStation **couldn't be easier:** connect your studio gear with standard CAT-5 cables, connect your console with just one cable, name your sources and set preferences with a browser, and you're ready to rock. PowerStation makes building studios about 3.14 times easier than ever.

GPI 0h! • **GPIO ports are built in** to PowerStation — no breakout boxes or add-on converters needed. One day, you might not even *need* logic ports: more and more products from companies like 2S-Seven Systems, Audio Science, ENCO, Google Radio Automation, International Datacasting, Omnia Audio, Radio Systems and Telos (to name just a few) use the Livewire™ standard to send their audio and logic control directly to Axia networks over a **single CAT-5 connection.**

Everything's included • Yeah, we said *everything*: PowerStation combines half-a-dozen essential tools into one compact unit. No hidden extras to buy, no "gotchas" after purchase. Inside that muscular chassis you'll find a **bulletproof mixing engine** capable of handling consoles up to 40 faders, a beefy power supply (with optional **redundant power**), machine control ports, and **audio I/O**, all in one box. And of course, since it's from Axia, the IP-Audio experts, a studio built with PowerStation can stand alone — or it can become a part of a large network quite easily. Thanks to **PowerStation Simple Networking,** you can daisy-chain up to 4 PowerStations directly for easy multi-studio installation without the need for a separate core switch. Just another way Axia makes IP-Audio easy.



You're covered • Axia has the most comprehensive warranty in the industry — **5 years parts and service.** And (not that you'll need it), **free 24/7 technical support,** 365-days-a-year. We've got your back, my friend.

E-I-E I/O • Finding space in the equipment racks is like living in a barnyard: too many chickens, never enough coops. So our team of obsessive designers fit **an entire studio's worth of inputs, outputs, logic and network connections** – plus an advanced DSP mixing engine and a massive console power supply – into just 4 RU. There's inputs for 2 mics, 4 analog inputs and 2 AES/EBU inputs, with 6 analog and 2 AES outputs. 4 GPI/O logic ports round things out. Want even more? Just connect the PowerStation Aux to instantly *double* the I/O — or plug some Axia Audio Nodes into its **built-in Ethernet switch.**

Fan free • PowerStation is **silent and fanless.** Because studios today are already full of PCs, laptops and playout servers clicking, whirring and generating heat — who needs more of that? Not only is there no in-studio noise with PowerStation, those **big extruded heat sinks** are just plain cool. No pun intended (or maybe it was. We're like that, you know).

Built like a tank • Remember when consoles were built to last? We do. At Axia, we're all about the long haul. **There are no compromises:** PowerStation uses only best-of-the-best components. Like studio-grade Mic preamps and A/D converters. A rigid, steel-framed, EM-tight chassis that shrugs off RF like Walter Payton brushing off tackles. An industrial CPU designed for high reliability in harsh environments. Beefy extruded heat sinks. Big, brawny handles to make rack-mounting easy. (And it looks cool, too.)

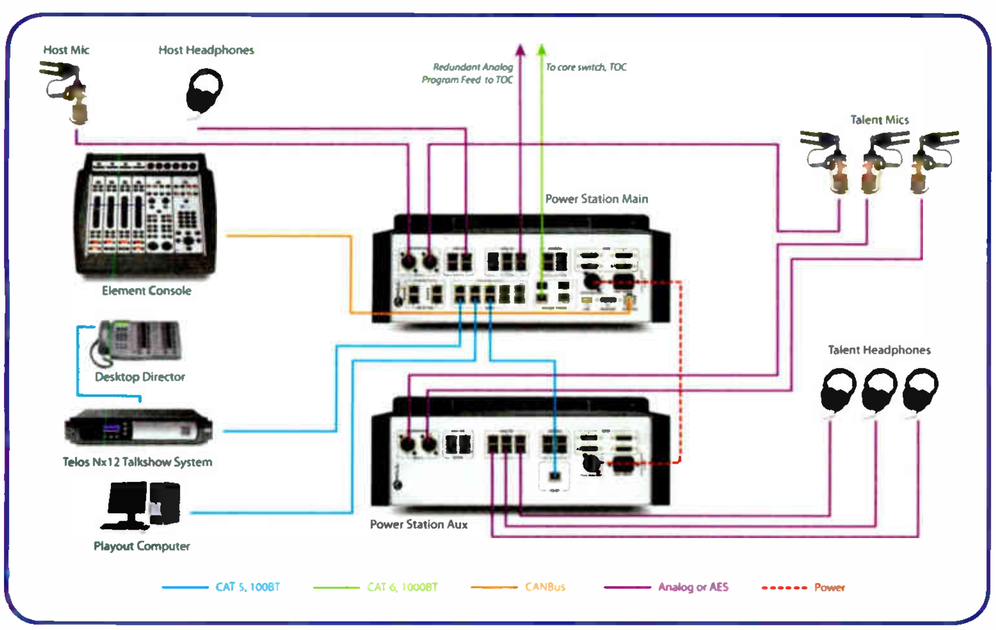
Redundant power redundancy • The power supply is the heart of any broadcast equipment, right? That's why PowerStation is **hardened against failure** with a **super-duty power supply** that sports enough amps to power an arc welder. And for those of you who like to wear a belt *and* suspenders, there's even a connection for **redundant auxiliary backup power** – with automatic switchover, naturally – that kicks in if it's ever needed.

Screen play • Yep, that's a DVI connector. **Your favorite monitor** – standard or widescreen – plugs in to present the console operator with Axia's "so easy an overnight jock could do it" **info-center display.** Meters, timers, fader assignments, mix-minus settings and more, all on-screen, on-demand.

Element 2.0 • With more than 1,000 consoles already on the air, Element is a huge hit. And now, thanks to suggestions from our clients, it's better than ever. Element 2.0 has cool features like Omnia™ **headphone processing** presets to give talent that "air sound", **super-accurate metering** with both peak and average displays, **one-touch phone recording** with automatic split-channel feed, **automatic mix-minus** for every fader, an eight-channel **Virtual Mixer** that lets you combine multiple audio streams and control them with a single fader, and metallic bronze or silver module overlays. And we haven't even begun to tell you about Element's **Show Profiles** that instantly recall talent's favorite settings, its **built-in Telco controls**, fully-integrated **talkback/IFB** and **Mic processing** by Omnia. And durable? Element is nearly indestructible, ready to take whatever pounding ham-fisted jocks dish out and keep going. You want examples? Element's **avionics-grade switches** are rated for more than two million operations. What look like ordinary rotary controls are, in reality, **bullet-proof optical encoders** — no wipers to wear out or get noisy. The silky-smooth **conductive-plastic faders** actuate from the side, not the top, so dirt and grunge stay out. The **high-impact Lexan** module overlays have their color and printing applied on the back, where it **can't wear or chip off**. The frame is made from **thick aluminum extrusions** that are stronger than truck-stop coffee. To find out even more about Element, visit AxiaAudio.com/Element/ . Grab some coffee and prep for a good, long read — remember, our marketers get paid by the word.

Come together, right now • Now that you know what you can do with PowerStation, let's build a studio. The diagram below shows how a typical Talk Studio might look. Mics and headphone feeds plug into the built-in Mic inputs and Analog outputs... your playout PC, using the **Axia IP-Audio Driver** for Windows®, connects to a built-in Ethernet port... and so does the Telos Nx12 Talkshow System (which sends 12 lines of caller audio, mix-minus and take/drop/next commands over **one skinny CAT-5 cable**). Send a **backup audio feed** to your TOC for extra peace of mind. And after all that, there's still plenty of I/O left to plug in the turntables for the Saturday night Oldies show.

The standalone network • You want your console to be more than just reliable — you want it **built like a battleship**. You want the absolute peace of mind that comes from knowing your gear will **never let you down**. And if you take one studio down for maintenance, you want the rest to be completely unaffected. So we designed PowerStation to be the world's **first networked broadcast console that doesn't *need* a network**. It's completely self-contained: sure, it plays nice with others, but unplug its network cable and it keeps right on truckin'. Build just one studio, or a dozen, at any pace you choose — your PowerStation network is ready to expand when you are.



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RFE/RL

(continued from page 1)

Museum of the Czech Republic.

Radio World asked me to offer a summary of the project for readers. I'm a long-term resident of Prague, now providing broadcast radio, TV and mobile phone solutions, upstreaming for mobile video bloggers and converged TV/new media systems. But I worked previously for Radio Free Europe and Radio Free Asia in RFE/RL's old building and I keep in touch with the organization. I've had the opportunity to watch this recent move unfold. I also work with some of the vendors mentioned in this article, though I was not involved in the move.

The story of the project begins earlier than Sept. 11, 2001.

In 1993, Václav Havel offered RFE/RL the use of the old Parliament building at the top of Wenceslas Square for a token three pennies a year, which allowed RFE/RL a chance to move out of its expensive Munich headquarters and refocus its mission for the changing east.

But free is not always inexpensive. Old phone systems, ungrounded wiring, outdated networks, unstable power grids, leaky generators and in general the job of retrofitting radio facilities into a space built for Soviet-era politics proved challenging. Its location on an island in a tourist zone between two highways made security tricky.

Technology Director Luke Springer in the studio.

Photo by Jonathan Marks

IT-BASED

Given its past, RFE/RL wanted to get things right this time, and after an unsuccessful search for existing facilities that met security, space and technical needs, management finally settled on building them from scratch.

Just as RFE/RL had used its move to Prague to upgrade to new VSAT and digital audio systems, this new move allowed it to convert to Axia Ethernet-based audio systems for its 49 studios, as well as networked TV and radio in-house distribution.

Instead of the reams of audio cabling that filled the closets and ceilings of the old building, sparse fiber runs and CAT-6 Ethernet provide the bulk of the distribution infrastructure, much closer to an all-IT shop than a traditional radio facility.

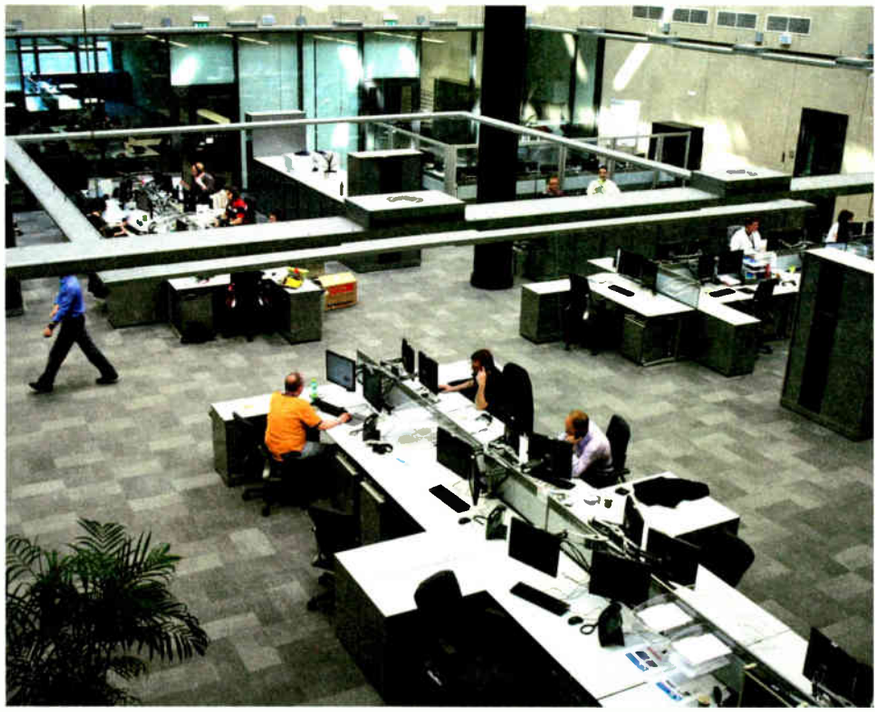
While most of RFE/RL is broken up into individual language services, there's a central atrium that holds the consolidated news and research staff.

With a staff of more than 500 and a six-story building of 220,000 square feet, there's a lot of room to cover for services and maintenance.

One big function for large news facilities is monitoring, both internally produced shows and external TV and radio programs. The old facility had an extensive building-wide coax system to carry the house feeds, and in the spirit of network consolidation, this has also been moved to a LAN-based solution.

In this case Amino video servers and playout boxes and dedicated displays work in tandem with the open source VideoLAN VLC program on the average desktop. (Since users can be editing material at their desktop, simultaneous monitoring on the same machine is often frowned on.)

For audio distribution, the Telos iPort is used to uplink multiple streams to an IceStream server, and special Power-Over-Ethernet networked speakers have



The Central News Room provides background news data for individual language services. With 27 such services and hundreds of broadcasters, training on new systems requires serious planning to work around people who are on continuous deadline.

TECH TEAM

Key members of the tech team were RFE/RL's Director of the Technology Division Luke Springer, Deputy Director of Technology Chris Carzoli, Director of Broadcast Engineering Bill Cline, Director of Technical Operations & Facility Management Don May, Director of Networks and Telecommunications Manfred Hanspeter and Director of Information Technology Ron Crozier.

Technical Division project management was by Michal Simice, while overall RFE/RL project management was by Nick Kavelakis, working under EC Harris, a consultant specializing in "built assets."

"Bill and his engineers worked together with Don and his tech ops guys for control room design," said Carzoli. "Engineers did the studio design with input from the sound techs and broadcasters, and their own knowledge and experience." The work involved on the studio, control and satellite portions of the project, Carzoli said, was a Broadcast Engineering team effort led by Bill Cline.

Don May was the "overall go-to guy for the entire project, with his CAD and facilities management experience, on top of his TV/video engineering expertise, and ability to be the pit bull when needed," Carzoli said.

The technical budget for the project was approximately $12 million.

Members of the
grand opening c
Springer, Manfre
Neil Kinnock, Ar
EYP Mission Crit
director of corp
of staff; Terry Di
Arup M&E consu
RFE/RL corporat

been designed to play out the MP3 streams, while PCs can access MP3 through normal players.

Once you hit the studios, the IT feel starts to change. The legacy Wenger booths have been moved from the old building, in a now-streamlined process that required four hours to dismantle, four hours to reassemble. New Czech hand-crafted furniture was designed both for aesthetic and functional purposes, keeping audio and Ethernet cabling well out of sight while easing production workflow with its horseshoe shape.

A mic boom, speakers, Axia console and Telos multistudio call-in system share equal time with the keyboards and LCD displays for the David digital recording system and other PC devices. The fanless PCs themselves are tucked into the furniture, while under the desk, a half-filled double rack holds the processing and network gear, the Axia distribution nodes and the mic I/O units. Since soundcards are replaced by Axia's network audio driver, the number of physical audio connects is minimal.

The overall studio feel is spacious, uncluttered and convenient.

Not all of the studios are full production spaces with separate broadcast rooms; 11 are combo production-broadcast, 15 are minis and two extra tiny 4-by-4-foot booths are used for basic news reads. Console size, number of mic inputs and other equipment choices are adjusted for the expected purpose of each type of studio, such as Zephyr hybrids for phone-in rather than full call-in systems.

CONSOLIDATION

With 27 language services and hundreds of broadcasters, training on the new systems requires serious planning to work around people who are on continuous deadline.

Language services are moved one at a time, and while most of the training took place last year, refresher courses are given just before the move. The broadcasters are well familiar with their David Systems Digas editing stations, having used them for several years, but the new Axia consoles and call-in systems take some getting acquainted, even with configuration presets on the board that handle most of the dirty work.

When I visited recently, one Iraqi broadcaster was running back and forth between adjacent studios doing two tasks that could have been handled on a single console. Still, the amount of broadcaster support required has decreased with the new facilities, while the number of on-air errors have dropped.

Part of that can be attributed to per-broadcaster presets that ease sharing studios without leftover setup mistakes, more intuitive interfaces, better integration of console, editor and call-in systems and good training.

The Master Control display wall allows easy monitoring of multiple satellite feeds (aside from its own countries, RFE/RL provides backup for Voice of

(continued on page 20)

ech team and colleagues gather after remonies. Lower row, from left: Luke l Hanspeter and Chris Carzoli. Standing: p HVAC consultant; Don May; John Meyers, cal Facilities security consultant; Bill Key, rate security; Bill Cline; Beth Portale, chief , Arup consultant director; Mark Bartlett, tant; Nick Kavelakis; and John Lindberg, counsel. (Other titles in text at left.)

RFE/RL

(continued from page 19)

America), as well as signal status, channel meters, network conditions, weather maps and other useful indicators.

The control room originally was designed to house Help Desk and other support functions as well. But in practice a stationary standby team is a thing of the past; with mobile phones, response personnel can handle other tasks while still "on call," and most networked systems are accessible remotely.

The move allowed the help line to be consolidated to one phone number for all systems, saving users much confusion, while computer, telco, network and broadcast audio racks have been consolidated in one space (aside from the satellite uplink room and per-floor network closets).

By using audio over gigabit Ethernet, an audio cable mess seen previously has largely disappeared, so that maintenance and debugging are simplified and cable tracing is much less chaotic.

Unlike the old days of "home run" audio connects back to the control room, the network audio breakout point is pushed as close to the end equipment as possible, typically in-studio, and overstuffed cable trays give way to much smaller floor-to-floor fiber runs and in-furniture wiring.

When Radio Free Europe started working with digital audio 14 years ago, it was with leftover networking from the Prague building's Communist days, along with a then-state-of-the-art 12-node FDDI network.

UPS on steroids: RFE/RL's basement holds enough backup charge and emergency cooling to keep the most important systems operational during even lengthy outages.

Bill Cline, director of broadcast engineering, monitors satellite signals and weather conditions from RFE/RL's operations center, making sure levels don't drop and 24 channels of audio get to the right places.

These days, communications means a team familiar with its sophisticated 10-gigabit Cisco core network providing high-definition video conferencing over Internet, VoIP to 23 bureaus, video, Wi-Fi phones and data in-house, redundant Internet links and a flexible SkyWAN FTDMA satellite network system for bureaus and distribution. Media assets alone takes up 8 Terabytes on the EMC2 DMX 1500 storage array.

Using several hundred VLANs in a dual fault-tolerant architecture in its Cisco Access switches, critical audio system traffic can be separated from normal office use and other networked systems.

Recent bouts of hacker attacks around the Internet continue to up demands for network security. RFE/RL uses nSense and nVision for intrusion detection, Cisco firewalls and Cisco Meeting Place to integrate desktop application sharing, Webcams and conferencing. A combination of CA Spectrum and CiscoWorks supplies overall network management, and Websense handles content filtering.

Raised floor cable runs in the rack room are now dominated by power lines to all the equipment. Having learned from the previous building's HVAC and power problems, management paid much attention to designing the new.

The building requires 2 Megawatts power, and the basement holds two 1 MW UPS systems — an impressive store of car batteries — with failover and power shedding capabilities to keep critical systems on air. Important areas of the building such as the rack room and master control are dual-supplied to run on either UPS. For HVAC, there are four chillers — two redundant — with a cross-matrix for guaranteed power supply, and four PACUs (precision air conditioning units) for the main equipment room with dual water supply.

Some of the staff had been involved in the earlier Munich-Prague move, which in some ways resembled a mad cross-border dash. There was more effort this time in formalized planning, using Microsoft Project, PRINCE2 project management methodology and other techniques.

This led to a more evolved business continuity plan to keep languages on the air and systems running. A halfway staging area was outfitted so that a system

out of the old facility would come to staging, its operational capability would be confirmed, and then it would be moved to the new building as another system replaced it.

Focus on user-acceptance of the new systems and facilities was much greater under PRINCE2 than it would have been without. System testing and acceptance was much more methodical and rigorous than prior efforts, identifying some major contractor flaws that might have slipped through otherwise.

One weak point in RFE/RL's management structure is that it has a split front office between the United States and Prague, so that response and diligence from above can be difficult to harness for schedule-impacting conflicts and contract issues.

In the end, large delays did pop up due to a contractor's organizational difficulties and unforeseen circumstances such as huge swings in currency exchange rates (the dollar depreciated 30 percent or more compared to the Czech crown since the project started, an important consideration for international projects).

Some tasks were reprioritized to lessen the schedule delay, such as moving the uplink satellite dish. Final transmission output still went back to the old building via a fiber connect, running 24 channels of audio across Axia nodes, until the move could be rescheduled. (With a 20 foot dish mounted to the opening inside of the building, traffic on the highway has to stop while a crane maneuvers over the outside walls).

This cross-town fiber was thrown in as part of a rather large telecommunications contract, heavy international calling being an essential part of daily reporting from dozens of countries.

While risk management can deflect or avoid some of these effects, with the specialized needs of large international radio broadcast from a small country, it's not easy to pick and choose perfect solutions.

Much has changed in the last eight years. The Czechs are now full EU members; RFE/RL has expanded broadcasts for Afghanistan and Iraq with most of its East European services dropped; and IP-based digital audio has come of age.

The new building not only had to meet operational requirements, but post-9/11 it needed to pass State Department security as well. With Secretary of State Hillary Clinton's visit to the new facilities in April, a ribbon cutting in May and the move of the Russian language service completed, RFE/RL could look forward to a summer coming-out party.

While the surroundings may not be quite the aesthetic paradise they were in RFE/RL's last location, it appears the organization has finally found its safe European home (cue up The Clash).

Bill Eldridge can be reached at bill@panvid.com.

MARKETPLACE

TUCKER SELLS YOUR SURPLUS GEAR

Radio vet Dale Tucker has a new venture as he approaches his 50th anniversary in the radio industry.

Tucker Broadcast Surplus is a broker looking to move broadcasters' old equipment. Tucker, a former account executive with Radio World, recently split off from an earlier partner in a similar business venture.

"In many cases, this gear has been in storage for years. Some stations are actually paying for storage, not knowing how to dispose of their surplus," he said.

The emphasis is on radio equipment though he'll entertain TV equipment proposals. TBS, he said, usually acts a pure middle man, rarely moving the equipment from a broadcaster's premises until it is sold. On occasion it will acquire and store equipment in its warehouse for consignment.

"We function as brokers, working hard to obtain the best price for each item on behalf of the seller ... We have a very large inventory of reel-to-reel units, consoles and much more."

For information, call the company in California at (916) 721-3410 or e-mail tuckerbroadcast@surewest.net.

NewTek TriCaster Streams Kiss 108

Clear Channel In Beantown Discovers the Ease of Adding Video to Station Offerings

PRODUCT EVALUATION

TriCaster are mixing audio and video, utilizing real-time chromakeying, live titling and live video streaming — but the unit has a long list of other features that can greatly reduce video production time as well.

COMPACT

TriCaster Studio itself is, ultimately, a computer in a mini-tower, measuring 15.5 inches D x 8.5 inches H x 10.4 inches W and weighing 19 pounds. It has six inputs for cameras/video sources: six Y/C, six composite (BNC), six component (BNC).

You have two options in utilizing inputs in the TriCaster Studio GUI: a six-camera setup wherein a single shared preview window is used, and a three-camera setup that allows for each camera to have its own individual preview. We run the unit in the three-camera configuration and it works great, especially when you only have enough resources to put one person at the mixing controls and three static cameras on tripods, giving you an instant one-man, three-camera shoot.

The TriCaster Studio can be controlled by a keyboard and mouse out of the box, but there are additional accessories available to better distribute various duties.

I recommend taking advantage of the LiveControl switching surface, which features a tactile connection to each input during production. It has backlit buttons that correspond to the active inputs for the preview and live channels, as well as an effects channel. It also features controls for transitions, with a convenient T-bar for manual fades and wipes. Even overlays can be triggered via LiveControl, rounding out what is a versatile and necessary addition to the TriCaster Studio.

The only downside to the TriCaster is its audio capabilities. The unit features four balanced mic/line inputs (XLR or phone), a four-track virtual mixer with three-band equalizer and pan controls, as well as phantom power, variable gain capabilities, pan controls and independent main and headphone volume controls. However, it lacks any kind of live audio compressor. Plugging cables directly into the unit is not recommended, because the resulting audio signal can be hard to control.

Obviously, the size of the unit hinders how much you can squeeze into it — and frankly, we would probably prefer to use some of our own signal processors even if it did have onboard audio compression. We usually run a dbx 166A compressor/limiter before the TriCaster for production, which does a good job of taming the signal variance. For larger productions, we'll typically add some multiband compressor/limiters. Of course, at the end of the day, most of our audio is going to be pretty compressed during the rendering and encoding process anyway, so any compressor unit should do the trick.

We utilize the TriCaster in live Web broadcasts/remotes, artist performances and Web liners/video IDs.

While before we were limited to single-camera streaming feeds on our Web sites, the TriCaster now allows us to shoot video with three camera angles, as well as add graphics such as lower thirds and bumpers. Later, when we want to make the content we just captured available for

(continued on page 24)

PRODUCT CAPSULE

NEWTEK TRICASTER STUDIO
Video Production System

Thumbs Up
+ Short learning curve
+ Professional transitions and titling
+ Easy one-button streaming
+ High-quality, forgiving chromakey effects

Thumbs Down
– No onboard audio compression

Retail: $9,995 MSRP

CONTACT: NewTek at (800) 847-6111 or visit *www.newtek.com*.

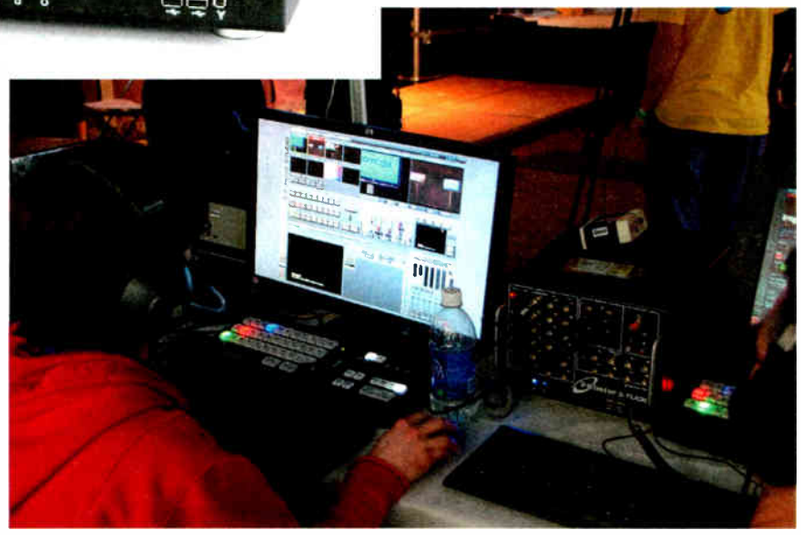
BY ANTHONY ALFANO

Radio has always been a resilient and adapting medium, but now, more than ever, radio has evolved and will need to continue to do so rapidly in order to remain relevant and profitable.

Realizing that this is the case, our industry has adopted many digital offerings in the hopes of evolving into being mixed-media content delivery vehicles, rather than only delivering radio (audio) content.

NewTek's series of TriCaster machines, dubbed "portable live production" units, have generated interest. In use they have the potential to unlock what is already proving to be a hot button for marketers: online video content.

Clear Channel Radio has been working with the NewTek TriCaster Studio configuration in Boston for about a year, and since then it has been integrated into Kiss 108's day-to-day operations because of its ability to produce professional results with limited resources.



Below: NewTek TriCaster Studio in action at the Kiss concert.

The primary functions of the NewTek

PRODUCTGUIDE

ATI THINKS DIGITAL

Audio Technologies Inc. (ATI) is shipping Series 2 versions of the DDA-106 and DDA-212. Both are 192 kHz-capable digital distribution amplifiers. The 106 is a 1 x 6 while the 212 is a 1 x 12 or 2 x 6 model. Both operate with external or internal sync and offer XLR or BNC connection options.

Also new from ATI is the MCDA-112, a studio master clock and 12x clock distribution amp. It handles AES3, AES11, word clock and SuperClock signals.

Lastly, the DM500 is a portable, handheld, battery-operable digital audio tester and monitor. It measures sample rates up to 96 kHz and digital phase errors among other things.

For information, contact ATI at (856) 626-3480 or visit www.atiaudio.com.

HERE FOR THE LONG HAUL

1976 **SCMS** founded by Bob Cauthen

1992 First fixed IBOC reception

1995 First live hd multi channel broadcast WFAE

March 2007 FCC approves hd system

June 2007 **SCMS** purchased the assets of the Harris Broadcast Center

2008 **SCMS** contracted with Google to be a U.S. reseller for their automation systems and Bird Electronics to be their U.S. stocking distributor for broadcast

January 2009 **SCMS**, Inc. purchased the assets of Bradley Broadcast
The Bradley acquisition increases the SCMS presence in government contracts, commercial sound, and the pro audio industries

This continues the SCMS philosophy of providing exceptional products, very competitive pricing with the best service available in the industry.

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Mid-West: 1-513-899-3036
North-East: 1-315-623-7655
Bradley Division: 1-800-732-7665

South-Atlantic: 1-770-632-1295
South-West: 1-210-775-2725
North Central: 1-513-376-8600
Pro Audio: 1-877-640-8205
Latin America: 1-760-650-1427

PRODUCTGUIDE

MUTEC SHIPS MC-4 FORMAT CONVERTER

For broadcasters with a lot of original programming, the digital cornucopia that is so pleasing can occasionally become digital Babel. Mutec, a German digital audio equipment manufacturer, offers a solution with its MC-4 multichannel audio format converter.

The MC-4 cross-coverts ADAT, AES3 and S/PDIF signals. It offers format and sample rate conversions from 32 kHz to 192 kHz. Word clock I/O and AES11 reference clock are also included.

An unusual feature for the MC-4 is the ability to lock two 8-channel sources of differing clock rates and convert them simultaneously.

The half-rack box offers I/O for ADAT optical, BNC, RCA, XLR and a 25-pin D-sub. Front panel status LEDs monitor operation.

For information, contact Mutec at 011-49-30-74-68-80-0 or visit www.mutec-net.de.

JBL SHIPS LSR2300 SERIES

Adding a new group to its LSR family of studio monitors, JBL is shipping the LSR2300 series, aimed at computer-based and project studio systems.

The smallest is the LSR2325P, a biamplified two-way monitor with 5-inch woofer and a 1-inch tweeter. The LF section is driven by a 55 W amp while the HF section is driven by a 35 W amp. The largest monitor is the LSR2328P. It is biamplified with a 95 W amp driving an 8-inch woofer and a 70 W amp pushing a 1-inch tweeter. The 2310SP is a powered subwoofer with a 10-inch woofer and 180 W amp. A two-channel bass management control is included with the sub.

JBL Professional Director of Recording and Broadcast Marketing Peter Chaikin said, "Our objective was to introduce a line that provides an unprecedented level of accuracy and performance at affordable price points."

For information, contact JBL Professional at (818) 894-8850 or visit www.jblpro.com.

OMNIA GOES SOFT WITH A/XE

Omnia Audio has a new iteration of its PC-based audio processing software called Omnia A/XE — Processed Audio Encoding for Windows.

A/XE can process audio for a variety of applications, bitrate-reduced and linear. It runs as a background service and can be managed and configured remotely with a Web browser; it can process and encode multiple streams in various formats simultaneously.

"Omnia A/XE can encode directly to MP3 or AAC as well as feed a Shoutcast-style or Windows Media Server in the MP3 format, or feed Adobe Media server an AAC stream," the company stated. "You can also pair it with your existing Windows Media, Real, mpgPRO or MP3 streaming encoder."

AVirtual Patch Cable allows Omnia A/XE to receive, process and send audio to other software on the PC. The user can "tag" the stream with "now-playing" information received from automation systems or another application.

A scheduler allows streams to be started and stopped at specific times and processing presets can be changed on a schedule, "perhaps processing the morning show differently than the afternoon one."

Features include adjustable wideband AGC with a three-band compressor/limiter, EQ and low-pass filter, and a look-ahead final limiter to prevent clipping.

The software is compatible with most "off-the-shelf" computers, Omnia said; requirements are Windows XP or later, 512 MB RAM, 20 MB free hard-drive space and a network card.

For information, contact Omnia Audio at (216) 241-7225 or visit www.omniaaudio.com.

TRICASTER

(continued from page 22)

on-demand purposes, we bypass the need for a standalone video editing program such as Final Cut Pro, and upload straight to the Web site after rendering.

CONCERT STREAMING

The best example of how we use the TriCaster is at our major station-sponsored concerts.

We just finished our 30th Kiss Concert for Kiss 108. This was our most feature-packed concert yet in terms of live and on-demand Web content. Using two TriCasters we had a live concert Webcast that consisted of backstage interview videos and on-stage performances. We also used two iMacs with Final Cut Pro to capture the feeds from the two TriCaster units (one for interviews and one for performances) and had them up for on-demand viewing within minutes.

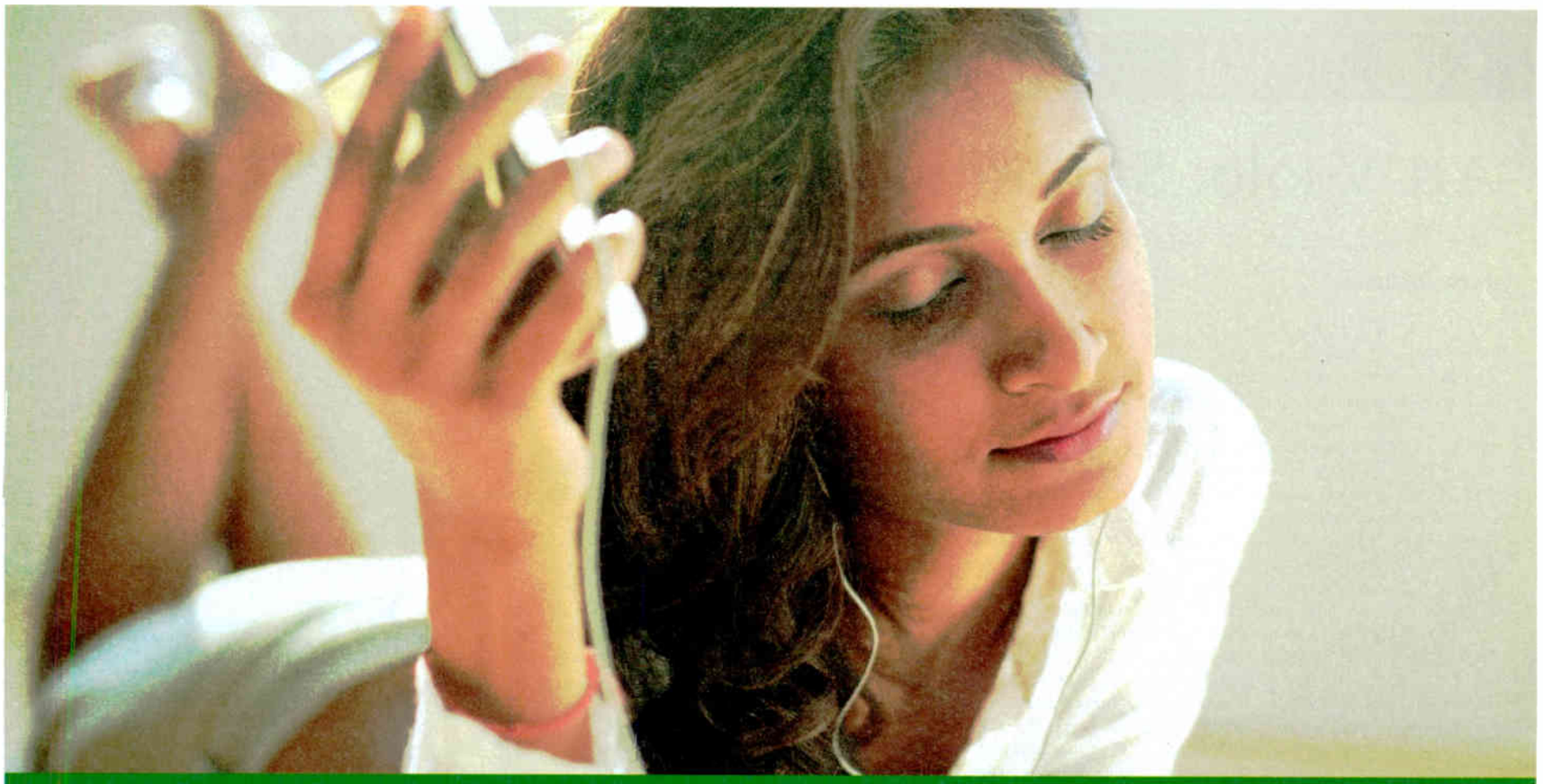
We also find TriCaster to be advantageous in situations where we have high-profile personalities visiting our stations because the units have the capability to simultaneously stream live online and capture to hard disk. Before, it would have taken hours to edit and mix three cameras' worth of content into a video for on-demand availability.

This year, we've been fortunate enough to transform our "artist lounge" (performance studio) into a green screen studio. All it really took to facilitate the transformation was the TriCaster, a green (chromakey) screen, a Lowell lighting kit and sound equipment. We also have cordless lavaliere mics and a teleprompter for video IDs that we utilize in our Web sites' video pre-roll inventory.

The live keying abilities are the best I have seen in a unit like this, and the built-in virtual studios are something we take advantage of every week. For example, on the Jam'n 94.5 site, *www.jamn945.com*, we post a weekly entertainment wrap-up program with one of the personalities from the station's morning show. Most Fridays, we're able to shoot the entire three-minute show in one take, and we're on to post-production (if it's even necessary) within 10 minutes. The efficiency we've gained in producing video for the station is unprecedented.

The TriCaster allows our radio station to produce high-quality video quickly, while consuming few resources (namely, manpower hours). Of course, the best part is that all of the productions mentioned have been sponsored in some capacity. These new capabilities we have are exciting and dynamic — and they're exactly the kind of "Oh, wow" content that get sponsors' attention. I would recommend the unit to any radio station cluster looking to produce professional video despite whatever otherwise limited budget and resources they may have. In Boston, our TriCaster Studio easily paid for itself in under a year.

Anthony Alfano is the online content manager for Clear Channel Boston.



In search of industry-leading audio quality for your iPhone Internet radio service?

The HE-AACv2 codec by Fraunhofer IIS holds the key to an exciting new era for mobile Internet radio.

HE-AAC®
Software from Fraunhofer IIS

High Efficiency Advanced Audio Coding (HE-AAC) v2 is rapidly becoming the codec of choice for mobile multimedia applications, including Internet radio. Significantly greater compression efficiency (up to 50%) compared to other codecs means that HE-AAC v2 is able to provide better audio quality, increased service stability and a more compelling listening experience to the consumer. More stations over the same bandwidth lowers the cost per station and stream.

Fraunhofer IIS supplies optimized SDK MPEG-4 HE-AACv2 decoder libraries and example frameworks to radio stations, service providers and media player developers for use with Apple iPhone® and other mobile platforms. Encoders and a versatile set of streaming tools are also available.

HE-AACv2 is part of a family of globally-renowned audio technologies available for the iPhone OS that also includes mp3, AAC-LC encoders/decoders, and MPEG Surround binaural decoders for low bit-rate 5.1 surround sound over stereo headphones.

Universally credited with the development of mp3 and the co-development of AAC and MPEG Surround, Fraunhofer IIS' Audio & Multimedia division remains at the forefront of advances in audio technology. Now, with HE-AACv2 for Internet radio, it stands ready to unlock a new generation of multimedia services that will prove irresistible to consumers worldwide.

Find out how **Fraunhofer** audio codecs could enhance your mobile Internet radio experience.

Visit Fraunhofer at **IBC** in Amsterdam (September 11-15), **booth 8.C81**.

Fraunhofer IIS

To find out more, please contact codecs@dmt.fraunhofer.org.

Art Vuolo: Still Radio's Best Friend

'Unofficial Historian' Archives Radio With a Camera and a Smile

BY KEN DEUTSCH

At age 13 Art Vuolo huddled under the blanket at night listening in the dark with an earpiece. His rocket-shaped plastic radio had an antenna sprouting from its nose. With an alligator clip to ground the radio to a wall plug, he could tune in "Night Beat" with Bernie Herman on WIRE(AM), a station a few miles away from his home in Indianapolis.

This was 1958. Within 10 years Vuolo would be on his way to making his own radio history, not as a DJ but as an archivist of the radio industry.

"The radio bug really bit me then," said Vuolo (pronounced VOE-low) from his home in the Detroit suburb of Novi, Mich.

"Another radio personality who had a big influence on me was Jim Shelton, who hosted record hops in addition to 'Platter Party' on WIBC(AM). He let me help him out at remotes and dances, and I got to the point where I could sign his name on his 8-by-10 promo photos as well as he could."

By DXing, Vuolo was able to extend his horizons and tune in stations all over the country at night. He kept a log of what he heard and came to appreciate the air talents in each market.

"Eventually our family moved to Ann Arbor, Mich., and in high school I became the DJ at our after-football Friday night dances. I went to a local record shop and picked up a bunch of 45s and always gave the store credit — 'Music courtesy of Discount Records' — and even I wore a bright red blazer."

He has long since stowed the platters and the sport coat in his closet, but his one-man company, Radioguide/Vuolo Video Air-Chex, offers an enormous selection of DVDs and audio tapes that chronicle American radio over the last 40 years. He inherited more than 1,000 Chicago-area audio tapes from the late Tim Benko's Windy City Airchecks, which are also available.

Whether it is a memorable programmers' seminar, a morning show crew in action, a station promotional video or a radio reunion weekend, it may be represented in Art's collection.

TURNING AIR INTO MONEY

His desire to turn his childhood hobby into a business began when he was working at an appliance store.

"Here I was at Big George's Home Appliance Mart in Ann Arbor," he said. "I sold clock radios, table radios, transistor radios and occasionally irons and toasters. A lot of people back in 1965 didn't listen to FM, and I wanted to upgrade them from the typical AM radio to one that had AM and FM. I did this by typing out a list of all the FM stations customers could receive on the more expensive radios. When I showed people what they were missing, they often bought the AM/FM radios."

Top: Art Vuolo, right, pals with Shotgun Tom Kelly.
Bottom: Vuolo's studio, equipped for working with legacy media.

Shortly thereafter Vuolo began to sell market-by-market station lists to advertisers, and he lined up a group of stores to distribute them.

"People would hand me their road atlas and ask me to make lists of stations for, say, a trip to Florida, because the push-buttons in their cars wouldn't get them anything once they got outside the local area," he said.

"I began to sell these lists to advertisers and I called them Radioguides. The first official one came out in Detroit in 1971. They are still being printed today. But it always worked the same way in each market: I had a radio station promote it, a sponsor would pay for it and a distributor like a restaurant chain handed them out."

In 1987, Nabisco's Baby Ruth candy bars bought the concept for more than 80 markets.

"I made some money then, but the biggest job I ever did was in 1995 when we created college football Radioguides," he said. "We printed about 10 million guides for the Big Ten, the Pac-10 and a couple of other conferences. I made enough money from that to buy my house." He produced his most recent Radioguide about a year ago. When RW checked in with him in July, he was pitching several potential clients, though "budgets are tight" of late, he said.

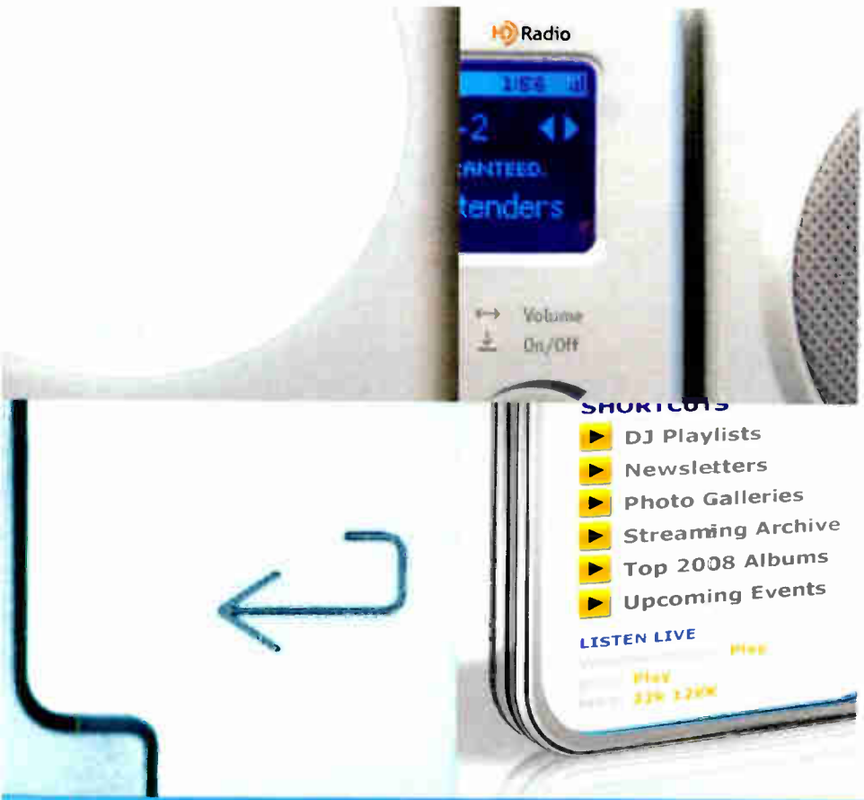
In the late 1970s, he was given the moniker "Radio's Best Friend" by Scott Shannon, who was then on the air in Atlanta. The nickname stuck with some help from trade publication Radio & Records in the 1980s. It fit because Vuolo always loved radio.

But he was also hit by the possibilities of a new medium: home video.

(continued on page 29)

The Dial and Beyond

Profit from what's now — and what's next.



NAB Radio Show® Engineering Program

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- preventing tower failures
- datacasting opportunities and much more!

Sessions are presented in workshop format with time for Q&A and interaction with experts and peers. The relaxed atmosphere of the NAB Radio Show means you always have plenty of time to network. Enjoy lunch and refreshments on the show floor while learning about exhibitor's latest products.

Attending the NAB Radio Show is an excellent way for busy radio engineers like you to advance your technical expertise, enabling you to maintain your edge in an increasingly competitive business.

Join the revolution. Register at www.nabradioshow.com

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Pennsylvania Convention Center, Philadelphia
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Add to the conversation on Twitter at #radiorevolution!

The Marketer vs. the Sales Person

These Days, Bad Advertising for Radio Stations Seems to Be Everywhere

PROMO POWER

Mark Lapidus

Read more Promo Power articles online at radioworld.com

Bad advertising for radio stations is everywhere.

I see it on busses, billboards, Web sites, newspapers and television. I even hear it on the *radio*. This bad advertising might communicate no message, too many messages, an incoherent message or even the wrong message entirely.

The problem starts with the general manager or market manager of the station. He or she likely has no marketing background.

Unfortunately, many of these strong-willed leaders believe they do know marketing thanks to their background in advertising sales. Wrong! Selling advertising requires a different skill set than communicating a message to the public to induce action.

If you're the general manager and you have ever started a conversation about consumer preferences with "Well, all of my friends think ..." you need outside marketing help to craft your messaging. Your friends may live in expensive houses, drive nice cars, employ household help and, in short, are nothing like the target demo of your radio station.

Push your agency for a guarantee that their creative will pass a focus group in terms of communicating the intended message.

Even if your friends aren't like that, the mere fact that you believe such a sample could justify any conclusion indicates a problem.

Since few pure marketing people remain in radio, the task of execution has fallen to program directors, already overwhelmed with too many projects, who probably learned what they know about marketing indirectly, either from a former marketing director or from reading articles and books.

SHOP FOR QUALITY

Who should handle the task? Answer: The best agency or marketing consultant you can locate.

Shop for someone with a great reputation who can show and play amazing creative that has already delivered results.

Check out their claims. If they show you a campaign that allegedly increased sales at car dealership, call the manager and find out if this was an accurate recounting.

If in the pitch to you the agency comes across as considering radio itself a product category, you're talking with the wrong agency. They're not here to sell radio; they need to be selling your radio station.

Don't choose any creative agency based on business they might be able to deliver later to your sales department from their other clients.

Do consider using a different creative agency than the one that will actually purchase your media.

See if your creative agency will offer a guarantee that their creative will pass a focus group in terms of communicating the intended message. If that creative fails the test, the agency owes you fresh creative.

Too often stations will spend precious marketing dollars on untested creative. Just because *you* like the creative they deliver doesn't necessarily mean it will create action. Often, what appears to be the best creative goes over the head of intended recipients. It's easy to be too cool for the room.

If you feel you don't have enough money to test, do your own focus groups. Show the creative without making comments and simply ask your test recipient to tell you what the message means. If the majority of viewers don't get it, your agency owes you new creative.

HOW TO SPEND

As you mull this concept of going outside for your marketing creative, you also may be trying to figure out which of the stations in your group actually will get the marketing dollars.

Will it be the new station in the cluster? Should it be the cash cow? Should it be station whose PD bugs you the most for the budget? Should you spread a little here, a little there?

I've tried all four approaches and I can tell you for sure that spreading money around so that every station gets a piece of the budget never works. A pushy PD does not necessarily have any reason to get the nod. The cash cow likely can take care of itself with the correct on-air messaging.

It's your new station (assuming the product is as good as it can be) that deserves the push.

How much is enough money for a marketing campaign? Another excellent question, one that can be answered best by a media buying service in your town. Be sure to check out more than one. Because they work on commission, some will lowball the figure just to take their cut of the pie.

What? You have no marketing budget? There is always trade. Yes, it can be effective if used correctly. However, even with trade you need — you guessed it — excellent creative messaging.

The author is president, Lapidus Media. E-mail to marklapidus@verizon.net

VUOLO

(continued from page 26)

"I went to a radio convention and a jock there named Shotgun Tom Kelly had filmed a sales presentation for his station showing the guys on the air. I just went nuts," said Vuolo.

When he bought a Sony Betamax VCR in April 1976, all his editing had to be done in-camera.

"I started recording presentations for a lot of stations and I'm still doing it today. The first one was for WIFE(AM) in Indianapolis," he said. He used a borrowed color TV camera to record that first tour, featuring key employees and the various jocks on the air.

"Now I shoot on digital tape and edit on an Avid or use (Apple's) Final Cut Express on my MacBook Pro."

VIDEO KILLED THE RADIO STAR

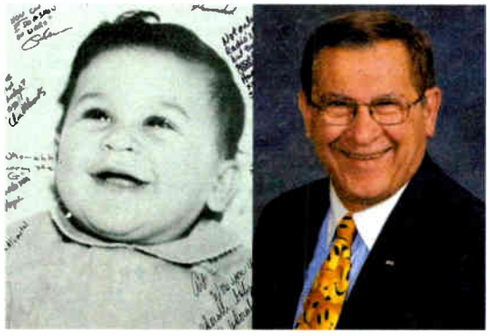
While many of Vuolo's products deal with radio's past, he also is interested in its future.

"It's a very visual world and presentations today lean toward video," he said. "With video you can show a crowd getting excited at a station event. You can show the jocks having fun in the studio."

Vuolo's Web site describes his "AirChex" as "video field trips into the studios of many of America's best radio stations for an educational and often very entertaining inside perspective." The site describes this as one of the largest video libraries of radio-related video in the country, if not the largest.

Many stations today are ready for their close-up. Studio lighting and décor are getting more camera-friendly. "Morning guys all think they should be on TV or the Internet," said Vuolo, noting that "The Bob & Tom Show," which he documented on video for 25 years, is now seen nationally on WGN America.

"We are no longer interested in 'theater of the mind.' We want to see the people behind the curtain."



Always smiling: Vuolo Then and Now

As a result, Vuolo says, "What I'm known for more than anything now is being an archivist. I'm kind of preserving it for future generations so people can see how it was at one time before the corporate world ruined it."

Vuolo sees the many media with which terrestrial stations compete, and he is not sure how AM and FM will fare.

"It scares me," he said. "The iPod has done a lot of damage. It's taken everyone 21 and younger away from radio. I sat next to a 15-year-old girl on a plane and she had an iPod. I asked her if she ever listened to radio and she looked at me like I was crazy. They download (illegally) off the Internet and don't see it as stealing music."

And while some stations have integrated the Internet into their operations, Vuolo wonders what will happen to traditional radio when wireless Internet becomes widely available in cars.

"Local information is the only thing that will save AM and FM. And I think that stations that just play music are in serious trouble because there are so many places for people to get music."

GENERATIONS TO COME

Does the Internet, with its YouTube content and mass access to video, take away the special niche position he's enjoyed as a radio archivist working with visuals?

"The stuff on the Internet is short-form," he replies. "I just had someone today order a 1994 KDWB reunion video, and it's very long. 'WLS Rewind' is 2.5 hours. My teaser on YouTube is 10 minutes! I sell DVDs because they are better quality than what is found online."

Vuolo's biggest concern is what will become of his audio and video library after he is gone. He is about to turn 64 and would like those assets to be preserved but also accessible to as many people as possible.

"Some day I won't be around and someone will have to sort through my stuff. I tell everyone, 'Don't wait for the estate sale!'"

Tom Kent is president of Tom Kent Radio Network and syndicates his own nostalgic oldies show. He is a long-time fan of Art Vuolo. "Over the years Art has become the unofficial historian of radio," he said. "I think it's great that he is capturing these moments when no one else is."

A quick trip to *www.vuolovideo.com* will demonstrate the breadth of Vuolo's collection.

Ken Deutsch is a former DJ who sincerely hopes no airchecks from his own inept radio years remain in this or any other collection.

BROADCAST EQUIPMENT EXCHANGE

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WANT TO SELL

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Want to buy Wheatstone audio consoles. B Lacy, 786-888-8310.

RADIOWORLD

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RCA 77-DX's & 44-BX's, any other RCA ribbon mics, on-air lights, call after 3PM CST, 214 738-7873 or sixtiesradio@yahoo.com.

MISCELLANEOUS

WANT TO BUY

Collector wants to buy: old vintage pro gears, compressor/limiter, microphone, mixing consoles, amplifiers, mic preamps, speakers, turntables, EQ working or not, working transformers (UTC Western Electric), Fairchild, Western Electric, Langevin, RCA, Gates, Urei, Altec, Pultec, Collins. Cash - pick up 773-339-9035

Equipment Wanted: obsolete, or out of service broadcast recording gear, amplifiers, preamps, outboard, radio or mixing consoles, microphones, etc. Large lots acceptable. Pickup or shipping can be discussed. 443-854-0725 or ajkivi@gmail.com.

I'm looking for San Francisco radio recordings from the 1920's through the 1980's. For example newscast, talk shows, music shows, live band remotes, etc. Stations like KGO, KFRC, KSFO, KTAB, KDIA, KWBR, KSFX, KOBY, KCBS, KQW, KRE, KTIM, KYA, etc, I will pay for copies... Feel free to call me at 925-284-5428 or you can email me at ronwtamm@yahoo.com.

REMOTE & MICROWAVE

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WANT TO SELL

Tascam DA 88 8-trk DAT rcdr/plyr, Tascam DA-38 8-trk DAT rcdr/plyr, Sony DTC-690 DAT rcdr/plyr, Tascam 112 MKII cassette rcdr/plyr, Tascam 122 cassette rcdr/plyr, Tascam 32 R-R, BO plus shpg. Steve, 719-955-4625 or stuzeneu@wayfm.com.

Large or small collections of 16" transcriptions or 12" transcriptions, not commercial LPs. Bill Cook, 719-687-6357.

RADIOWORLD *Equipment Exchange*

TRANSMITTERS/EXCITERS/TRANSLATORS

WANT TO BUY

Schnader telescriptions 16 mm musical films produced in the early 50 s. Bill Cook, 719-687-6357.

SATELLITE EQUIPMENT

WANT TO SELL

(3) Wegener Unity 4000 rcvrs, one unit has 4 audio output ports and two units have two audio output ports, BO + shpg. Steve, 719-955-4625 or stuzeneu@wayfm.com.

STATIONS

WANT TO SELL

For Sale: AM in Rome, NY, xlators in Enid, OK, Jacksonville, NC, Temple, TX. Email mraley@bbnradio.org.

Oregon CP, 161191. 775. 317.7887 vernongsnyder@hotmail.com.

TAX DEDUCTIBLE EQUIPMENT

Donations Needed: All Volunteer, Non-profit Low Power community radios stations need Equipment. Will offer tax deduction letter, You determine donation value, We will pay shipping. Equipment shared between three Wisconsin stations. Looking for Mics, Mixers, field equipment, etc. You name it. Email: Dan@WIECradio.org.

CONSULTANTS

POSITIONS WANTED

Are you a small market station needing a good nuts & bolts engineer in the Los Angeles area? I will make your station shine! CET, fully FCC Licensed. Available for Full/Part-time/Contract work. Available immediately. Mitchell Rakoff, 917-324-8466 mitchellrakoff@yahoo.com.

Extremely knowledgeable and articulate racing writer/talk show host Adam Amick is available for shows, correspondent, features, etc. Check out www.bleacherreport.com for samples. Call 214-384-5812 or email: adam@rubbinsracingshow.com.

Radio/TV Experience! Extremely creative copy, show prep, plus great ideas and character voice abilities. Dedicated, and takes direction well. Musically inclined. Jack, 512-671-0240. finneymusic@gmail.com.

TRANSMITTERS/EXCITERS/TRANSLATORS, Cont.

WANT TO SELL

Energy-onix 4kW FM, brand new, still in crate, includes exciter & spare parts kit, $15,000. A Harris, 307-871-1173.

EnergyOnix 4kW FM, brand new, still in crate, includes exciter & spare parts kit, $15000. A Harris, 307-871-1173.

RCA BTF-20 E1 20kW FM xmtr for parts, call for needs. P Russell, 321-773-2746.

CCA AM 10,000 D – Call John KQSS **928-595-0263** between 10 & 6 PM Pacific Time.

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WANT TO BUY

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TUBES

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The following distributors serving the broadcast industry would be glad to help you with any of your requirements.

REQUIRED READING

I have just finished reading the June 3 issue, in which I enjoyed several interesting and compelling articles on radio broadcasting.

READER'SFORUM

I especially enjoyed James O'Neal's "The FCC at 75: When the Federal Government Stepped In." Having taught college courses in broadcast history for many years, much of the information was familiar to me; but this was a refreshing and accurate review of the development of broadcast regulation from the early days of radio to the present.

The article should be "must reading," especially for today's younger broadcasters, because of the historical perspective and insight it provides into how radio regulation became what it is today, having evolved from the era of spark transmitters and crystal sets to the present age of digital broadcasting.

Herbert H. Howard, Ph.D.
Professor Emeritus
College of Communication & Electronic Media
The University of Tennessee, Knoxville
Knoxville, Tenn.

SIRIUS XM: NO MORE 'WOW' FACTOR

I like how Mel Karmazin does his math since the hostile takeover of XM by Sirius last year. Royalty fees, which we all hate, are indeed charged to sat-rad companies. But they will increase *one-half of 1 percent* this year and each year for the next three, yet Mel is raising rates 15.3 percent instead.

Paul, this is on top of the extra $2 per month he increased the "extra" radios on the plan, and in addition to the fee charged for once-free online listening.

As if it wasn't enough to break his promises to the FCC about rate increases, he never did deliver the four free channels on each service that were promised within 90 days. He never did go through with an "a la carte" programming package for existing customers (and claims that only one Sirius radio can do it, when he knows damn well that every XM radio has the capability to have channels blocked, hence a la carte can be done tomorrow).

Only one radio has both services available, and then only one at a time, not seamless. So Mel has pretty much broken all his promises to the FCC.

If this isn't enough, let's talk content.

The XM music channels used to be programmed by music lovers. But in recent years these were under the Gestapo control of Jon Zellner, who believes in only playing songs that "everybody knows" over and over again. Zellner has since left for Clear Channel.

The "decades" program directors and most on-air personalities were fired when the merger occurred. The "decades" channels ('70s on 7, '80s on 8 etc.) used to have huge playlists, more than 2,000 songs each, and you heard songs with the "wow" factor, as in "Wow, I haven't heard that song in 10 years, that's one of my favorites." Now we get approximately the same 480 songs over and over again; and they repeat faster than on terrestrial radio because there are no stop-sets.

I used to love the music on XM; now I'm a disgruntled customer who feels that Sirius XM could care less what we, the paying music customers, want to hear. I was among the 400,000 subscribers who cancelled last quarter; a second XM radio goes dead this month. Now I will have useless XM hardware.

That leads me to my HD Radios, also becoming useless hardware, as nobody is doing anything decent with their HD-2 streams locally. Radio — AM, FM and XM — has frustrated me so much that I will return to the under-appreciated MiniDisc player for my music or succumb to the evil iPod empire that I have fought off for so long because of the love that I once had for radio broadcasting.

John Pavlica Jr.
Toledo, Ohio

SALES HELP

I just wanted to say thanks to Mark Lapidus. I just finished reading his article on sales rookies that was posted by the Radio Advertising Bureau ("Sales Rookies Need Sales Mentors," May 20).

I have been in radio for just about a year now and it was is refreshing to hear these words. I was not afforded a sales mentor or even manager for that matter. It was more of the sink-or-swim method. His insight is well appreciated.

Aaron Amershek
KSEK(AM)
Account Manager
Pittsburg, Kan.

CORRECTION

THAT'S JOHNSTON WITH A 'T'

The User Report on page 34 of the Aug. 1 *Buyer's Guide* misspelled author Steve Johnston's last name.

ADVERTISER INDEX

This listing is provided for the convenience of our readers. Radio World assumes no liability for inaccuracy.

PAGE	ADVERTISER	WEB SITE/URL
5	Armstrong Transmitter Co.	www.armstrongtx.com
19	Arrakis Systems Inc.	www.arrakis-systems.com
15-17	Axia - A Telos Company	www.axiaaudio.com
29	Broadcast Tools, Inc	www.broadcasttools.com
3	BSW	www.bswusa.com
7, 35	Comrex Corporation	www.comrex.com
4	ERI	www.eriinc.com
25	Fraunhofer	www.fraunhofer.de/en
28	Grace Broadcast Sales	www.gracebroadcast.com
32	Heil Sound, Ltd.	www.heilsound.com
10	Inovonics Inc	www.inovon.com
11	Logitek	www.logitekaudio.com
21	Moseley Associates	www.moseleysb.com
13	Omnia - A Telos Company	www.omniaaudio.com
23	SCMS	www.scmsinc.com
20	Systems Store	www.systemsstore.com
9	Telos Systems - TLS Corp.	www.telos-systems.com
1	Tieline Technology	www.tieline.com
2, 36	Wheatstone Corporation	www.wheatstone.com

Sign Off, and Save Some Money

It's Time We Started Cleaning Up Our Act — Not to Mention the Nighttime AM Band

BY PAUL THURST

A few years ago I was tasked with finding out what was wrong with our night coverage on 1420 WLNA(AM).

COMMENTARY

It seems that listeners as close as 2 miles from the transmitter site were having problems receiving the station. The station is a DA-2, 5 kW day, 1 kW night. It was constructed in the early 1980s and was (is) in relatively good shape.

After checking all of the antenna parameters, I did a set of monitor points and partially ran two of the radials from the last proof. What I determined was that the station antenna array and transmitter were operating substantially as licensed back in 1980.

A quick drive around about 2–3 hours after sunset showed that at night, our interference-free coverage area was anywhere from 2–4 miles from the transmitter, depending on conditions, confirming what our listeners were complaining about.

A brief search of the FCC database revealed that there were no fewer than 65 stations licensed to operate at night on 1420 kHz in the United States alone.

Add to that 26 more stations from Canada and Mexico and the frequency is chaos. I began to wonder what the point was of even being on the air.

Is anyone out there actually listening to Fox Sports Radio at 2 a.m. with multiple carriers beating in? How many stations do we really need to have repeating Larry King, Jim Bohannon or any of the other overnight AM programming?

WASTED ELECTRICITY

A little research of the FCC rules — Part 73.1740(a)(1) — shows that commercial radio stations need to adhere to the following minimum operating schedules:

Between the hours of 6 a.m. to 6 p.m. local time, stations must be in operation two-thirds of the total hours they are authorized to operate;

Between the hours of 6 p.m. to midnight, stations must be in operation two-thirds of the total hours they are authorized to operate.

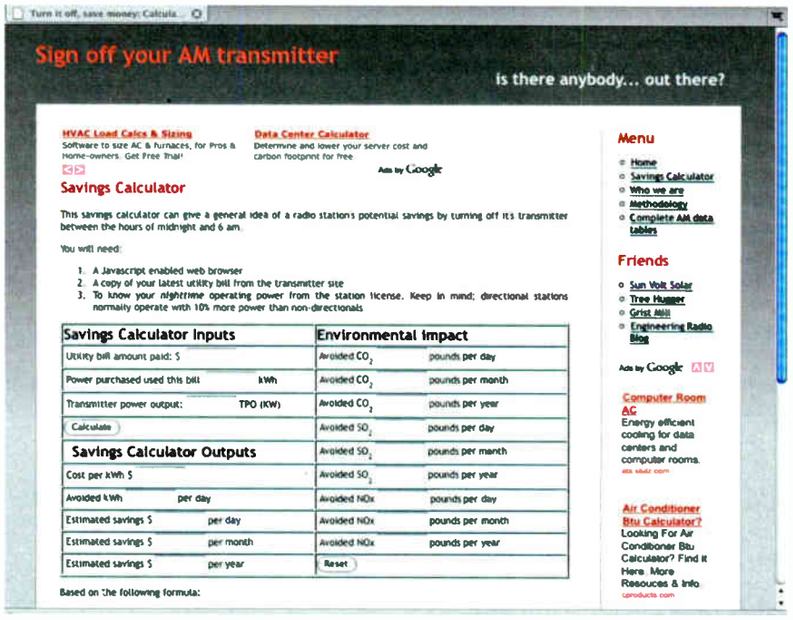
Note that there are no requirements to operate between midnight and 6 a.m.

How much electricity (and therefore money) is being wasted keeping these stations on the air 24/7?

For my own station, that calculation is pretty simple: I estimate that the BE AM6A transmitter uses about 2,200 watts while transmitting at 1 kW nighttime power. Add to that the air conditioning load in the summer, and it likely averages 2,600 watts.

If the station were signed off from midnight to 6 a.m., that would add up to 15.6 kWh per day or 5,694 kWh per year. In Westchester County, the going rate for electric is $0.18 per kWh. Yearly, that adds up to $1,024.92. Electric rates are projected to increase by 3–4 percent per year, which will make that figure even higher in the coming years.

This does not figure in the summer months, when the station operates for 1–1.5 hours at full daytime power before 6 a.m.



The author created a savings calculator to give a general idea of a station's potential savings by turning off its transmitter between midnight and 6 a.m. Find it at *www.signitoff.org* under Savings Calculator.

In accordance with 73.1740(a)(1), we could sign off at 11 p.m. or even 10 p.m. and still meet all of the minimum operating requirements and further reduce our power bill.

There are a total of 4,778 licensed AM radio stations in the United States. Seventy-seven of them are Class A stations (formerly known as "clear channel" stations, not to be confused with Clear Channel Communications). Even most of the big Class A stations are carrying some form of syndicated network talk on the overnight. How many AM stations are making money selling advertising on this? How many are breaking even?

Some stations operate at higher powers overnight, some operate at lower powers. It would be difficult to pinpoint the electrical savings if, for example, half of the AM radio stations choose to start signing off from midnight to 6 a.m. However, for this example, if WLNA represents an average AM station, this would result in the savings of about 13,603,000 kWh of electricity per year. That is not nothing.

As far as environmental impact: The EPA estimates that each kWh of electricity generates 1.72 pounds of CO_2, 0.00412 pounds of SO_2 and 0.00348 pounds of NO_x, according to a 2002 U.S. Department of Energy publication, "Updated State-level Greenhouse Gas Emission Coefficients for Electricity Generation."

Therefore a savings of 13,603,000 kWh represents a reduction of 11,699 tons of CO_2, 56,044 pounds of SO_2 and 47,338 pounds of NO_x per year. That is not nothing either. SO_2 and NO_x are primarily responsible for acid rain and destruction of great swaths of forest on the East Coast of the U.S. that are down wind of the midwest coal-fired power plants.

It is time that we broadcasters started cleaning up our act, stop wasting energy and start saving a little money in this time of tight budgets. Besides, it might make the AM band almost listenable again overnight.

The author is director of engineering for Pamal Broadcasting Ltd. in Albany, N.Y.

HOW TO

Send a letter to the editor:
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READER'SFORUM

FROZEN RADIO

Has Dave Wilson ever heard of podcasting ("We're Wasting Our Time," July 1)? If he checked iTunes' podcasting rankings, he'd notice it's loaded with radio broadcasts "frozen" for anyone to enjoy. NPR makes a wonderful living sponsoring its podcasts.

Podcasting: radio's version of on-demand. (It's OK; we don't have to buy Sirius XM, they've never made a dime.)

Fred Jacobs
Jacobs Media
President
Southfield, Mich.

OPINION

You Need Not Fear the CAP

EAS Modernization Won't Be as Difficult As Some Would Lead Us to Believe

BY JERRY LEBOW

Much has been written and discussed about the modernization of the Emergency Alert System.

COMMENTARY

Its roots are still planted in the old EBS system and the National Weather Service WRSAME system of 14 years ago. It's certainly time we moved, kicking and screaming, into the 21st century, with technology and systems that can selectively and rapidly reach the maximum number of affected people in times of emergency.

DON'T FEAR THE CAP

While any new technology brings fear, uncertainty and doubt, the coming EAS modernization isn't going to be as difficult as some pundits would lead us to believe.

Since many EAS vendors have included Common Alerting Protocol compatibility in their new models (such as the Sage Digital ENDEC), almost 10 percent of broadcasters already have the EAS equipment they'll need to receive CAP messages from state or local CAP servers. More stations will become CAP-ready as they replace or upgrade old equipment.

Several states have already added CAP to their capabilities. The National Weather Service has begun testing of their new CAP-based hazards dissemination system. Wade Witmer of the Federal Emergency Management Agency said at the 2009 NAB Show that CAP will be used to deliver messages to the PEP network, and proposes to test this capability before the 180-day clock starts.

The start of the FCC 180-day clock will simply accelerate a process that is already underway.

As CAP is rolled out, you won't see much, if any, change to your day-to-day operation. The FCC EAS requirement remains; even after the 180-day clock expires, you'll continue to receive EAS alerts over monitor receivers. Many of you will replace your 13-year-old EAS equipment and get voice synthesis, digital storage of text and audio for logging, network printers, Web browser interface for remote control, e-mail logging, automation interfaces and other features you've come to expect from any new piece of station gear. Your year-old new EAS gear may only need a downloadable software update to support the required version of CAP.

A new EAS/CAP device will continue to use filtering. You'll select the alerts you air by type and geographic area. Audio hookups (digital or analog), LED signs, character generator interfaces, printers, GPIO will still apply. Your device will interrupt programming in the same way it does now, full automatic, manual assist or manual.

> **The industry doesn't need** a delay in the process to invent the technology or build up inventory.

At the station level, you will need to integrate the new equipment. I don't want to oversimplify, but the process won't be mysterious and will be no more difficult than any data hookups you are doing now. It will be much like setting up a connection to a router, and if you can do that (or have the number of someone who can), it won't be hard.

You may also have a redundant CAP path through a satellite receiver, an RF modem or a VPN connection to a distribution network.

While each state may have a slightly different twist on how CAP messages will get to you, the technology is known and is already being deployed in some areas.

Most of the remaining items to be resolved have to do with security; and again, the technology is known. The procedures to use it are being worked out.

One need that could use attention is a redundant relay for CAP messages. Since the raw CAP data is too large to send directly over the broadcast audio channel, a backup path from emergency management to broadcasters and cable systems is needed. Perhaps the FCC will take action on a proposal by the Society of Broadcast Engineers and others to allocate dedicated channels in the soon-to-be-auctioned 700 MHz "D block" spectrum for CAP relay use.

AVAILABILITY

Recent articles wonder about the availability of EAS/CAP equipment.

Several vendors, Sage among them, have been shipping CAP-compatible systems since last year. We, and no doubt, they, are ready to ramp up production as needed.

The industry doesn't need a delay in the process to invent the technology or build up inventory. Unlike the original EAS deployment in 1997, equipment manufacturers have had ample time to prepare and some systems are in the field before the clock starts.

WHAT ARE WE WAITING FOR?

There are, of course, some additional issues to overcome before the CAP transition is ready to proceed.

Final tweaks to the protocol are being made; discussions on the best way to use the new tools by all participants (origination, relay, broadcasters, end users) are underway. Compliance testing will be formalized. New national and state dissemination systems will be tested. Training modules will be written.

All of the major EAS equipment vendors have been working together for more than a year to assure interoperability. The SBE has also been working on several committees to ensure that the needs of the broadcast community are known.

We applaud Wade Witmer's decisive actions at FEMA to get the show on the road. And we applaud SBE, and especially Clay Freinwald and Gary Timm, for their tireless efforts on the industry's behalf. We eagerly await the compatibility testing to begin.

If the industry does not get distracted by spurious issues, there is no reason that a new CAP EAS system could not be on the air in 2010, providing the public with timely and relevant information in times of emergency. Sage Alerting Systems stands ready to be part of the solution.

Jerry LeBow is vice president of Sage Alerting Systems and was one of its founders in 1996. He was a partner at Sage Broadcasting, holds several FCC licenses and is an active member of several EAS committees. He also is a founder of Mercury Energy, a renewable energy integrator based in New York.

RADIOWORLD

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