



RADIO WORLD

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AM HD Radio Has Stalled; Now What?

BY LESLIE STIMSON

With U.S. AM radio in general facing identity questions in the era of young consumers, iPods, MP3 players, Internet radio and other forms of media, so too toils digital AM.

Group heads of engineering and other industry observers say that digital AM is more technically challenging and expensive than FM. The flat, or even decreasing, number of AM stations embracing it certainly bears this out.

AM HD Radio, it seems, is the step-child of the digital world.

LIMITED UPTAKE

Proponents point to AM HD's dramatic improvement in audio quality over that of analog. But several experts say that, at best, AM HD is having mixed success. Many even characterize it as struggling or not successful. Others, however, say it's too early to tell what its future will be.

Only a core number of mostly big-wattage, large-market stations are broadcasting in AM digital; most of those transmit their digital signals only during the day, according to engineering observers. Many of the stations on-air with AM HD are owned by members of the HD Digital Radio Alliance.

Reports of the number of AMs actually broadcasting in digital vary [see sidebar, page 8], but most of the U.S. HD Radio rollout has taken place on FM, as Radio World has reported over several years. That trend is confirmed by a BIA study this spring that counted 455 AMs with licenses to air digital. BIA found that 322 AMs were on the air with digital signals, about 16 percent of the total number (2,056) of digital stations; FMs account for the balance. IBiquity Digital recently put the number of AMs on air at 286.

Programming strategies meanwhile continue to evolve and may have a bearing on uptake.

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Not Many Stations Have It; Others Even Turned It Off. Where Does It Go Next?



Photo courtesy Glen Clark & Associates

THE RELEVANCE OF AM

This is one in a series of articles Radio World has published over the past year exploring the business challenges and successes of AM radio. Read the series and reader reactions at www.radioworld.com/article/92680.

A crew works on an AM project at 50 kW ESPN station WMVP Chicago, which airs HD Radio day and night. Glen Clark & Associates redesigned the antenna patterns in 2005 as well as the AM phasors for improved HD performance in 2007. In general, the AM digital rollout appears to be on pause; will it resume?

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Among AM HD Users, Opinions Vary

For Most, the Conversation Eventually Comes Back to Lack of Receivers

BY RANDY J. STINE

The experiences of broadcast engineers managing AM HD Radio signals appear to vary greatly.

Radio World talked to a number of chief engineers using the digital platform in various markets. While some declined to be interviewed, citing the sensitivity of the subject and company policy, others agreed to go on the record for this article, in addition to those quoted in the story on page 1. The range of responses is indicative of the variety of opinions about digital.

While some seem satisfied with AM HD's performance, others said the lingering interference issues limit its appeal. Most agree that it is hard to gauge the success of AM HD due to the limited number of receivers in consumers' hands.

"I consider (AM HD) a success. I think the improvement in sound quality is



Installation day for WTAW(AM-HD) in College Station, Texas, in 2008. GM Ben Downs is at left, with Chris Dusterhoff, chief engineer for Bryan Broadcasting Inc.

fail over to analog. The number of HD radios in our market is probably pretty small, so we were just really hurting ourselves with a noisy sounding analog signal."

WKAR(AM), which operates on 870 kHz, also received complaints that it interfered with listeners' ability to receive WLS(AM) at 890 kHz out of Chicago, Beer said.

'HARD TO CLASSIFY'

Ron Schott, chief engineer for WJBC(AM) in Bloomington, Ill., said the station has received no interference complaints — "to others, or ourselves" — since the station began broadcasting in AM HD in 2007.

"The HD experience for WJBC is hard to classify without a large base of (HD) receivers in the market," Schott said.

WJBC, licensed to Townsquare Media, is a non-directional AM operating 24

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incredible," said Brett Gilbert, director of engineering for the Clear Channel Tulsa cluster, which includes KTBZ(AM-HD) and KAKC(AM-HD).

"Unfortunately, I don't know how many listeners we have that use HD radios."

Clear Channel, an early adopter of AM HD Radio, has had no complaints regarding interference to other stations by the pair of stations in Tulsa, he said.

KAKC, which began HD broadcasts in 2006, is a directional AM operating on 1300 kHz with 5 kW day/1 kW night. It is digital during the day only to eliminate constant digital and analog blending in certain listening areas, Gilbert said. KTBZ is HD 24 hours a day. The station is a directional AM operating on 1430 kHz with 25 kW day/5 kW night.

Noncommercial WKAR(AM) in East Lansing, Mich., launched HD Radio in 2005 but turned off the digital carrier in 2009, according to Harold Beer, chief engineer for WKAR, which is licensed

to Michigan State University.

"After years of encouraging listeners to get better quality wideband AM radios, we ended up degrading their listening experience with a 5 kHz bandwidth, -35 dB SNR analog signal once we turned on the IBOC digital," Beer said.

"We also collected a number of negative comments due to the digital carrier, including complaints about the buzz that was always present, especially if a listener had an analog tuned radio that was slightly off-channel." WKAR is a daytime directional AM operating on 870 kHz with 10 kW.

Michigan State University officials eventually placed a simulcast of WKAR's programming on the HD2 channel of WKAR(FM). "There was simply no reason to continue to broadcast AM HD after that time," Beer said.

Beer said AM HD works but wasn't successful for his station. "In our worst reception areas, due to power line radiation and so forth, the digital would

hours on 1230 kHz with 1 kW. The station serves central Illinois and is approximately 120 miles south of Chicago.

WPEN(AM-HD) in Philadelphia, which installed HD Radio in 2004, has had no interference complaints from other stations and only the occasional complaint about its own analog signal from listeners with wide-band AM radios found in the field, according to Larry Paulausky, chief engineer for Greater Media's cluster in Philadelphia.

"The only negative has been during nighttime operation when trying to receive the station at the fringes of the HD coverage and the too-frequent blending back and forth between HD and analog audio when listening on an HD receiver. It can be annoying," Paulausky said, "but the improved audio quality is a good thing."

WPEN is a directional AM at 950 kHz with 25 kW day/21 kW night.

Paulausky envisions a "smart receiver"

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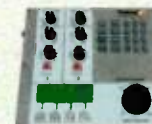
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Jack Neff Was a Self-Made Man

'Fiercely Independent' Engineer and Salesman Succeeded in Multiple Business Endeavors

Broadcast engineering lost a friend when Jack Neff died recently.

You may know Neff as the man who ran the research firm Dataworld for many years before he retired in the 1990s. If your memory is longer, you may recall that he helped found radio equipment manufacturer Broadcast Electronics.

In our dealings, I always found Neff to be a warm, affable man. According to Skip Tash — former publisher of Radio World and a close friend and former employee of Neff's — he was a veritable social butterfly, the kind of fellow who found golf boring yet played it for its social aspects. Neff threw huge parties with his wife Mabel, loved to travel, worked in sales and really enjoyed people.

Perhaps it came from being the youngest of three boys, losing his mother early and spending a lot of time out in the world on his own early in life. Born in Montana in 1922, John L. Neff was already on the move a lot in his teens while in the care of maiden aunts; and he moved to Washington at age 17 to be near a brother who worked in the Navy.

He rented a room, attended high school and took various jobs to pay his bills including parking cars and working as a valet at the Uptown Theater.



The late Jack Neff

He worked for a while for Western Electric, installing and testing central office telephone equipment, mainly at the Bethesda Naval Hospital.

"But the job that shaped his career was his first job as a radio engineer with Mutual radio affiliate WOL," Tash recalled.

"Jack noticed the guy who lived

across the street from him, wearing a nice suit, driving a fancy car. He thought to himself that he would like to be like that guy.

"So he walked across the street, knocked on his door and introduced himself. After a few more meetings, this man turned out to be the owner of WOL. He told Jack to just go to the station and tell them that he sent Jack. That is how Jack began his lifelong career in broadcasting."

Long before he was a successful business owner, Neff showed the personality traits that would make him one.

As a young adult, he was one of the engineers who handled the famous Fireside Chats given by Franklin Delano Roosevelt. "It was just Jack, the Secret Service and the president alone in a room," Tash said.

Neff served in the Army Air Corps as a radio engineer during the later war years, then returned to WOL, working first in engineering, then in sales; he rose to national sales manager; he worked at

FROM THE EDITOR



Paul McLane

WMAL(AM) and WWDC(AM), where he held executive sales positions.

It was in 1959 that Neff helped start BE, first as vice president of sales. He was there when the company operated out of a garage under the towers of WWDC and was a key sales executive in BE's SpotMaster years, eventually becoming the company's president.

He purchased Dataworld from A.D. Ring's engineering firm and made its name a byword in engineering and regulatory circles.

"Dataworld became his baby, where he and Mabel devoted all of their efforts," Tash recalled. Dataworld was a family business, and the Neffs employed many members of their families there. The firm is now part of BIA/Kelsey.

A Life Member of Association of Federal Communications Consulting Engineers, Neff also was a member of Sons of the American Revolution. He loved to travel, to cook and to play cards. Tash also recalls him as "fiercely independent, with a strong will to live. ... Death was not in his vocabulary."

I'm grateful to Jack Neff for his support for me and his friendship with Radio World. My thoughts are with his family.

AM HD

(continued from page 3)

capable of noticing the number of blends occurring over a short time period and subsequently locking the audio to analog mode to alleviate such problems.

The HD channel of WTAW(AM-HD) in College Station, Texas, did cause some audible interference with the station's analog signal when it was brought online in 2008, said Chris Dusterhoff, chief engineer for Bryan Broadcasting Inc.

"I really don't notice it anymore, but I know it is still there. But we've had no reports of interference with other stations," Dusterhoff said.

WTAW, which is a non-directional AM at 1620 kHz with 10 kW day/1 kW night, has had positive feedback from listeners who have purchased HD Radio receivers, Dusterhoff said.

What are your technical experiences with AM HD Radio? Write to radioworld@nbmedia.com. Include your station's frequency, authorized power and other details.

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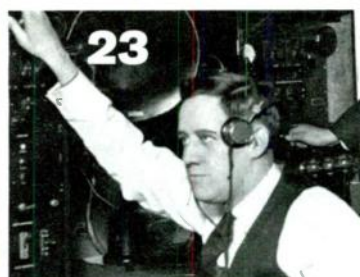
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IEEE 60th Annual Broadcast Symposium Set

BY RANDY J. STINE

ALEXANDRIA, VA. — Organizers of this year's IEEE Broadcast Symposium say radio broadcasting is still a dynamic industry with constantly evolving technology.

The symposium, Oct. 20–22 in Alexandria, Va., will feature technical sessions, including an examination of the FM IBOC power increase and potential unintended consequences, spectrum issues and the FCC's broadband plan.

Broadcast engineering experts Ron Rackley, Ben Dawson and Geoff Mendenhall are among those who will speak. The symposium is presented by the Broadcast Technology Society of the Institute of Electrical and Electronics Engineers.

Mendenhall, vice president of transmission research and technology at Harris Broadcast, is "one of the most respected transmitter engineers on the radio side of the industry, who really knows the mechanics" of transmitters, said Tom Silliman, president and chief executive officer of Electronics Research Inc. Silliman is co-chair of this year's conference; he, Mendenhall, Dawson and Rackley are all past recipients of the NAB Radio Engineering Achievement Award.

"We had a lot of interest this year in topics specific to radio, with the change in [digital] power levels and talk of using different sidebands for multicasting in IBOC. It has generated a lot of station interest."

His co-chair is Eric Wandel, president of Wavepoint Research, Inc.

MULTICASTING

Paul Brenner, chief technology officer for Emmis Communications, is a presenter. Brenner is president of the Broadcaster Traffic Consortium, a partnership of radio companies formed to distribute data via FM-RDS and HD Radio technology.

"[Paul] will give the engineering community an idea of the multicast capabilities of IBOC," Silliman said.

The goal of the symposium is to present the technical developments in radio and television broadcast transmission engineering, Silliman said.

Luncheon keynote speakers will include James O'Neal, technical editor of TV Technology, who contributes to Radio World on the history of radio technology; and Jim Martin, director of intelligence, surveillance and reconnaissance programs at the U.S. Department of Defense.

"The military is doing a lot of different things with frequencies right now.



The Westin Alexandria

This should be particularly interesting from a radio perspective in regards to use of spectrum," Silliman said.

A manufacturers reception the second evening is sponsored by Dielectric, Jampro, ERI, Harris and Shively Labs.

Early registration for the IEEE Broadcast Symposium ends Oct. 1; visit www.ieee.org/organizations/society/btl.

The conference is open to everyone, with discounts for Broadcast Technology Society members.

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DIGITAL AM

(continued from page 1)

To boost listenership and expose their content to the younger audiences advertisers seek, owners increasingly have begun simulcasting AM station programming over FM translators; the FCC began allowing that practice about a year ago in an attempt to give AMs some relief. Some owners also are simulcasting their AMs on the multicast channels of their digital FMs, or on analog FM signals; the latest is Cox-owned WSB(AM), simulcasting on sister station WBTS(FM), Doraville, Ga.

According to one school of thought, when group owners pursue such strategies they feel less need to invest in HD Radio conversions for their AM outlets.

Many of AM HD's problems mirror those of the overall band, a crowded slice of spectrum that's prone to interference and coping with ever-increasing sources of man-made noise.

IBOC proponents say an all-digital mode — in which stations would turn off their analog signals and broadcast only in digital — would clear up interference issues that affect some AMs using the hybrid mode. But no one can say when or if such a time will come, especially lacking a federal mandate for digital radio. That's an eventuality no one seems to think is likely anytime soon.

The poor economy of the past two years has contributed to AM HD's stagnation as group owners concentrate on business basics like reducing their debt load and paying other bills.

Owners who have converted stations to digital appear especially focused on maintaining their FM digital systems; if they are not yet turning a profit via iTunes Tagging or traffic data, the thinking goes, those FM data

services are at least bringing in incremental revenue that could someday lead to profit.

Yet HD Radio developer iBiquity Digital Corp. says it remains committed to a digital solution for AM. It has been working on a transmission scheme it hopes will answer the concerns of AM owners that haven't converted or that are less than satisfied with the technology.

"We're working on it," President/CEO Bob Struble told Radio World recently.

TOUCHY

AM HD is a touchy subject. Some corporate engineers at groups of various sizes did comment for this article; others did not answer requests; several engineers declined to comment or could only do so anonymously. Therefore it's difficult to glean what some broadcast groups that invested in AM HD Radio and in iBiquity itself think about the AM rollout.

It annoys listeners and drives them away.

— A corporate DOE

iBiquity says some 286 AMs were airing digital as of mid-August. The company says approximately 50 others have turned the digital off due to technical problems or for other reasons and another 50 or so licensees have yet to turn it on.

The majority of stations that turn it off, according to

engineers interviewed for this article, do so because of blending problems between digital and analog in weak signal areas or because of interference to the host's analog signal or to a neighboring station's analog signal.

Citadel Broadcasting turned off the nighttime digital on its 10 AMs in the fall of 2007. At the time, Director of Corporate Engineering Martin Stabbert cited complaints from listeners and stations on adjacent channels, including both Citadel stations and others, in and outside the affected markets.

Citadel, a member of the HD Digital Radio Alliance, took part in "empirical testing" with iBiquity to see what could be done to mitigate nighttime interference. In 2008 and 2009, Radio World reported that iBiquity continued its AM testing. To date, there's been no public word on the outcome of those tests.

Contacted recently to learn if the situation had changed, Stabbert said he could not comment about AM HD.

Journal Broadcast Group has two out of six AMs airing IBOC signals full-time; it has not turned any off. Andy Laird, vice president and chief technical officer for Journal — and a member of the National Radio Systems Committee who played a key in early NRSC IBOC testing — said, "Diligent installation has a large impact on 'self' interference. The antenna performance/load presented to the transmitter needs to meet or (hopefully) exceed iBiquity specifications." He recommended that most AMs hire engineering consultants experienced with AM IBOC to evaluate and specify antenna upgrades to be performed.

His two AMs airing a digital signal are KFAQ in Tulsa and WTMJ in Milwaukee. KFAQ is 50 kW non-directional day, 50 kW directional night, and has had no complaints about interference, he said. WTMJ is 50 kW directional day and 10 kW directional night; the station

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has received no complaints concerning first-adjacent interference, while three listeners complained about an upper second-adjacent.

"In all three instances our signal level was 500 mV or greater and the desired second-adjacent station was substantially below 0.5 mV," Laird said. "In all three cases, other radios owned by the complainant worked without issue; it was a specific [wideband] receiver that had the issue."

A corporate DOE for a radio group owner with stations mainly in mid-size markets told Radio World recently his company shut off the digital on all of its AMs — completely, not just at night — due to the blending back and forth between analog and digital in areas where the digital signal is weak.

The blending irritated managers, he said. "It annoys listeners and drives them away." He declined to say how many stations were involved because he did not want his company to be identifiable.

Blending can sound jarring if the time alignment between the analog and digital signals isn't right, according to another DOE whose company has IBOC AMs on the air.

Critics long have claimed AM IBOC should be taken off the air because of interference to other stations from the digital sidebands. At least one corporate engineering executive agrees. And a third technical source, head of engineering for a major-market group owner, told Radio World, "Where AM IBOC was hoped to help most — nighttime coverage — it failed. I don't see any reason to install it."

NOT ALWAYS A NICE BLEND

Some corporate engineers are more open about the issues with AM IBOC.

Of Greater Media's five AMs, only one is licensed for HD; that digital station remains on-air, according to Vice President of Radio Engineering Milford Smith, who is chairman of the NRSC.

Smith believes AM IBOC is impressive in terms of fidelity and "freedom from typical AM interference," especially on high-power stations. However, unless the

The solutions to interference are proving to be far more elusive than were first expected.

— Bert Goldman

listener is in a relatively strong signal area, "any perturbation of the signal, particularly by overhead metallic objects," like power lines or overpasses, "results in a blend to analog and then (of course) back to HD." Signal disturbance is a challenge in the analog world, too, he notes.

"The real issue is that the blend back to analog results in such a dramatic change in quality and also loss of the stereo image that it is disconcerting. Also, the frequency at which the blending occurs can become extreme in an urban situation and result in further irritants," he continued.

"As Greater Media's Chief Engineer Larry Paulausky in Philadelphia has suggested, perhaps some kind of statistical computation in a radio could be used to minimize the blends, based on a recent history of reception."

Lincoln Financial Media VP of Engineering Barry Thomas agrees with Smith that it's too early to say if AM HD can be considered a success, or, according to Thomas, what its future holds. Both say they've not experienced HD Radio-related interference. Of Lincoln Financial's five AMs, four are transmitting IBOC signals.

Smith said, "If improvements could be made in the robustness of reception — and I realize that's a tall order, given both the available bandwidth and the very tough environment of the AM spectrum — its future could only be enhanced."

Engineering consultant Bert Goldman does not consider AM HD a success so far, pointing out the technical challenges with AM are far greater than with FM.

"I hope AM HD Radio has a future, but I think the solutions to interference are proving to be far more elusive than were first expected," he said. From his experience in the field, "There are considerable interference issues with AM HD," and not just at night.

"Even when stations are operating their HD properly, there is noticeable interference to stations on adjacent channels, daytime and nighttime. I have heard this interference on stations which are second and third adjacencies."

He recently had a situation in which an AM had a problem with its IBOC signal. "Whereas prior to the problem there was some noise on second and third adjacencies, the signal was causing noise all the way out to 50 kHz from the host HD station," Goldman said. Several stations were experiencing the problem and sought help; Goldman said his company was able to identify the offending station. "They were very cooperative and removed the HD immediately until they were able to correct the problem."

(continued on page 8)

LIVE & LOCAL



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DIGITAL AM

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"It's certainly understandable that stations will have problems with any transmission system," he added, "and hopefully any that do will act as responsibly as the station I referred to; but it points out a danger where not all situations like this may be quickly identified and corrected."

Goldman also is part of the Broadcast Maximization Committee, which supports expanding the FM band down to TV Channels 5 and 6 for digital-only operation. As part of the committee's proposal, AMs that wanted to do so could migrate to that band, replicate their daytime footprint and add at least one additional stream of audio.

Even if this plan received FCC approval, it would take a number of years to implement. But "for a long-term solution, I think this has more potential than either refining the AM HD problems or waiting for all AM stations to convert to HD-only," said Goldman.

'A GOOD TOOL'

Cris Alexander, director of engineering for Crawford Broadcasting and a contributor to Radio World, said that of the company's 13 AMs, 11 transmit HD signals. The company has not taken HD Radio off any stations but had to "significantly" modify the digital carrier level of one, KBRT in Los Angeles, in an effort to mitigate interference to an overlapped second-adjacent station.

He said Crawford has been on both sides of the interference issue, receiving interference from another station and reportedly causing interference to another. Both cases were in the L.A. market. He said the company was able to work out compromises amicably with the other stations.

"In the interference-received case, the

other station reduced its upper digital carriers by 2 dB and by doing so reduced its 25 kHz third-order intermod products by 6 dB or more, alleviating the interference from the third-adjacent channel station.

"In the interference-caused case, we essentially turned off our upper digital primary carriers."

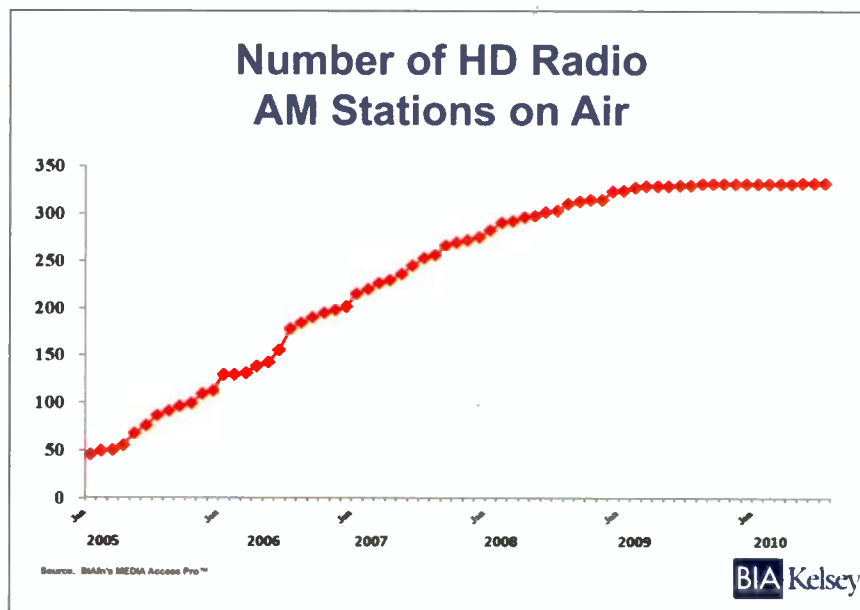
HD coverage and performance on that station, KBRT, remain good, Alexander said, "and we believe this demonstrates that asymmetrical sidebands offer a good tool for mitigating interference where it occurs."

Several observers say economic pressures have worked against AM HD. One engineering group head said AM IBOC is "expensive [and] difficult, and AMs are becoming more problematic. They're not the profit centers they used to be."

One source, formerly with a large radio group and familiar with handling a broadcast cap-ex budget, said obtaining financing is difficult in this economy, especially for smaller stations, the kind iBiquity hopes will convert. Additionally, publicly owned groups are being "squeezed by private equity guys."

"Prices go up if you've got a directional antenna because the system has to be designed and tuned to accept the signal with minimal signal degradation," the person said. "It's more expensive for AM than for FM ... for a broadcast system that doesn't provide the financial return that an FM will." If you're spending more money for a lower return, "financial backers question that," he said.

Glen Clark, president of Glen Clark and Associates, a boutique engineering firm specializing in high-power AMs, said AM HD faces "the perfect storm" including a lack of confidence in financial markets that has affected the economy. He points to the trend of AMs putting even their big-ticket talk program-



AM stations on the air with HD Radio over the last 5-1/2 years, according to BIA/Kelsey.

ming on FMs. And now, "Broadcasters are fighting off the fact that bankers hate us and Steve Jobs has the under-25 crowd listening to MP3s."

ECONOMIC BOUNCE?

Some observers predict that stations, AMs included, will resume HD conversions when the economy improves.

Greg Urbiel, director of engineering for Saga Communications, says the unstable economy certainly has given his company pause for both AM and FM digital expansion. Of Saga's 91 stations, 30 are AMs; of those, six are HD. Saga has had some difficulty with a transition to a folded unipole antenna in Milwaukee; all of the other HD AMs have been providing full service since inception, he said.

"When dollars have been recently available on the transmission side,

they've been to replace some of our aging FM rigs. And we make the HD transition for that station at that time. There will be more AMs to follow as we do life-cycle replacements," he said.

Speaking as an individual, Urbiel said he reaps the benefits of CBS Radio-owned WWJ(AM) in Detroit operating in HD. "I am always impressed that I get to listen to 'studio quality' at my desk. I personally enjoy and appreciate it."

Alexander of Crawford Broadcasting said that, while noting the improvement of digital AM over analog, Crawford is aware that digital AM growth has stagnated.

"Even within our own company we have opted not to convert a couple of stations for economic reasons. It is our belief that the economy is ultimately behind this stagnation and our hope that growth will resume when the economy and business picks up again."

A NEW CONFIGURATION

In response to AM criticisms, iBiquity developed an optional AM IBOC transmission configuration meant for digital AM stations that air talk content, have low audio program density or are not planning to send discrete data.

Some high-powered AMs told the company that certain wideband receivers made before 2003 produced audible interference to a host station's analog signal from the digital secondary and tertiary sidebands.

The new MA-1 exciter configuration reduces the digital bandwidth and increases the analog bandwidth of the AM IBOC signal, according to the company.

iBiquity tested the new configuration in its lab, then in the field on three stations for a month; it believes the configuration will reduce host interference and give a station uniform digital coverage "out to

(continued on page 10)

HOW MANY AMs ARE HD?

The number of AMs transmitting HD Radio is much smaller than the number of FMs doing so, but stating an exact total is problematic. It's also hard to gauge how many have turned AM HD off.

There are approximately 4,790 licensed U.S. AMs. In August, an FCC database listed 293 with digital licenses, about 6 percent of all AMs, though being licensed does not necessarily mean the digital is currently on the air.

iBiquity in August said 286 AMs were airing digital, and 51 more were licensed but not yet on-air. Earlier this year research firm BIA said 322 were on-air with digital; it said it gets its information from iBiquity; but the latter said BIA also collects information from stations directly and therefore its databases may not match.

What about stations that have turned HD AM off? In total, according to iBiquity, some 52 have been on the air but are now off due to technical problems, mainly antenna broadband issues, or for other reasons. Some stations do inform iBiquity when they have gone off, usually temporarily and for maintenance and/or repair reasons, the

company said. For example, in Minneapolis this summer there have been periodic "on/off's" associated with repairs to a tower. "Given the proximity of this to key retailers, we are pretty tuned to this dynamic," said an iBiquity spokesman. (Best Buy is headquartered in Minneapolis.)

However, as the main article reports, at least some AMs have turned off HD Radio without the intention of turning it back on anytime soon.

Engineering consultant and IBOC critic Barry McLarnon's list (topazdesigns.com/liboc/station-list.html) showed 245 AMs on-air with IBOC in mid-August, with 48 believed to have turned it off completely. However the list relies on a variety of anecdotal reports sent over time.

So to summarize available numbers: BIA in April said 455 AMs had been licensed, of which 322 were on the air. The FCC in August listed 293 digital AMs licensed. iBiquity in August said 286 AMs were on the air, 52 had turned it off for various reasons and 51 were licensed but had not yet turned it on. IBOC critic Barry McLarnon thinks 245 were on in August and 48 were believed to have turned it off.

— Leslie Stimson

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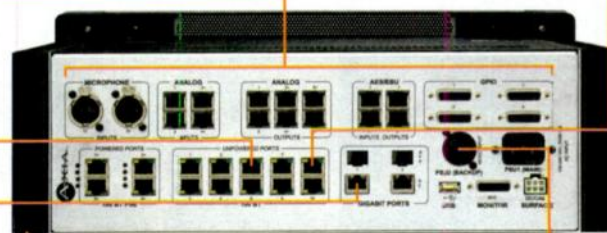
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Element **saves the expense** of outboard processors: Omnia™ processing can be applied to every Mic and Codec channel. Headphone processing is also built in, for times when it isn't possible to monitor your broadcast signal directly. 3-band parametric EQ can be applied to every channel, too, via software or drop-in module controls.

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AxiaAudio.com

DIGITAL AM

(continued from page 8)

the point where the digital ends," according to Jeff Detweiler, director of broadcast business development.

With the new configuration, digital AMs can transmit using the full 10 kHz bandwidth.

Detweiler said a number of AMs are interested in trying out the new configuration.

Sterling Davis, vice president of technical operations for Cox Media Group, confirmed his company is interested in testing the MA-1 configuration when it's available. Cox turned off four or five AMs in 2007, Davis recalled, because of complaints within the company about self-interference, as Radio World reported at the time.

His personal belief is that digital will keep radio up to date in the future. Davis would like to see a government mandate for radio to go digital, as there was for television.

Harris and Nautel confirmed they are testing the new exciter configuration. Tim Anderson, manager of strategic radio market/product development for Harris Broadcast, said testing of the new "Reduced Bandwidth Mode" is underway in its Mason and Quincy labs.

"This mode can also reduce the cost of implementation as it relaxes the more stringent antenna bandwidth symmetry requirements," Anderson said. Harris is seeing "significant" interest in the new operating mode and Anderson says "several" broadcasters who had turned off their digital AMs are interested in beta testing it. Harris expects the new mode to be available as an upgrade to its Dexstar

AM Exciter this fall.

Nautel is factory testing the modified MA-1 mode AM HD exciter configuration and plans to release it soon, according to Hal Kneller, market development manager, who notes that Nautel's first broadcast transmitters were AM systems and the company continues to invest heavily in AM. Nautel believes the change could produce a "noticeable change in listeners' receivers.

IBiquity believes the modified MA-1

believes. "It needs to be standard in all radios. If you purchase a new TV today you will be getting an HD-capable device, period. Radio needs to be the same," said Robinson.

"If everyone buying a new car or purchasing an AM/FM radio-capable device automatically gets HD, consumer penetration will significantly increase and help give HD the legs it needs to stand on."

Tom Ray is vice president/corporate director of engineering for Buckley

with HD Radio marketing in an article about trying to find a factory-installed in-dash radio for his new Ford (Radio World, Aug. 11).

Additionally, Ray and Laird pointed to the proliferation of electrical noise that plays havoc with the AM band. This too affects AM HD adoption.

Ray said it's time the industry acknowledged that AM reception isn't what it was even 10 years ago and thinks perhaps it's time to redefine the service contours for AM.

"In many locations, you cannot listen reliably to AM stations much beyond their 2 milliVolt contour, never mind the half milliVolt," he said.

Laird described as "alarming" the rate at which urban electrical noise is rising. With continuing increases, "it can be argued that AM radio reception will no longer be practical except for those stations with very strong signals.

"When digital reception is possible in an electrically noisy environment, AM IBOC gives a station significant advantage. As the count of auto receivers increases, IBOC AM will have a distinct advantage over analog stations. We believe the advantages of AM IBOC outweigh the disadvantages for continued viability of the AM system."

And what about the group that speaks for many U.S. commercial broadcasters?

The National Association of Broadcasters remains committed to ensuring AM radio has a competitive digital future, spokesman Dennis Wharton said.

"AM HD Radio is a great solution in many cases and admittedly a challenge in some others due to congestion in the AM band. We're hoping to see more AM-capable HD Radio products in the future as the marketplace matures and innovative solutions are developed for AM broadcasters."

Radio World welcomes descriptions of your own experiences with AM HD Radio, particularly if your opinion has not yet been heard on this topic. Write to

Lstimson@nbmedia.com.

I am always impressed that I get to listen to 'studio quality' at my desk.

— Greg Urbiel

mode works and is hoping to get feedback from stations evaluating it. "We're interested in 'Does it meet their expectations?'" Detweiler said.

RECEIVER SALES

But improved transmission technology will not put more receivers directly into the market. Some observers blame poor receiver availability for the lack of uptake among AM stations.

Jake Robinson, director of engineering and IT for Emmis Communications, says HD Radio in general suffers from poor adoption by consumers and manufacturers. The broadcast group has two AMs; one of those, WFNI in Indianapolis, is airing an HD Radio signal.

AM HD's future lies in the vehicle and receiver manufacturers' hands, he

Broadcasting and WOR(AM) in New York, and a Radio World contributor. He says that of Buckley's seven AMs, only WOR, is digital. "We're waiting for the [HD] radios to be out there and commonly available," he said.

Inadequate marketing is holding that up, he believes, and consumer education about HD Radio needs to be ramped up. Tabletop HD Radio receivers need the loop antenna that comes with the unit, he said; many buyers throw it away.

With car radios, the consumer needs to understand the settings on the radio — such as digital-only, analog-only and auto modes. "These are usually explained somewhere in the manual. How many consumers read the full manual?"

A "quick start" guide would be the better place to put this information, and/or a separate flyer explaining HD Radio, how it works and what to expect if you select one of the modes, he said. "Otherwise, the consumer is going to assume that 'it just doesn't work' and ignore the technology."

AM HD needs to be made easier for consumers so they know what to expect. Ray recently described his dissatisfaction

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NEWSROUNDUP

FM IN PHONES: Several technology groups oppose the idea of linking a performance royalty settlement between broadcasters and performers to a requirement that mobile devices include FM chips. Six trade groups signed the letter to Congress: CTIA-the Wireless Association, the Consumer Electronics Association, the Telecommunications Industry Association, TechAmerica, the Information Technology Industry Council and the Rural Cellular Association. "Calls for an FM chip mandate are not about public safety but are instead about propping up a business which consumers are abandoning as they avail themselves of new, more consumer-friendly options," they wrote.

KRKO: Nearly a year after vandals brought down two towers serving KRKO(AM), Everett, Wash., rebuilding began. The Everett Herald reported that the 349- and 199-foot towers would be lifted by crane. The station has remained on-air using a backup transmitter. An eco-terrorism group called the Earth Liberation Front claimed responsibility for the destruction. The FBI is still investigating.

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A New Method to Vandal-Proof RF Signs

Also, How to Tell If an Antenna Heater or Other Load Actually Is Active

BY JOHN BISSET

Last column I mentioned that late summer/fall is ideal for outdoor projects. I found another for you to do — or better,

WORKBENCH

by John Bisset

Read more Workbench articles online at radioworld.com

to delegate to the intern you have in your department. It involves affixing signage to your tower fences more permanently.

Steve Riggs is with Isotope LLC, a joint venture he and David Maxson formed to provide innovative broadcast and wireless solutions. In my opinion, their first one knocks the ball out of the park.

Tired of seeing expensive warning signs removed, the company distributes the Sign Guardian. Pictured in Fig. 1, this system for mounting signs on chain-link fences is manufactured of heavy-duty nylon 6/6 material. The bolt and nut are made from low-carbon steel zinc alloy so they won't rust or corrode. The device works on standard 2-inch chain-link fence and has been tested and used by several state transportation departments.

Installation is simple. Slide the Sign Guardian(s) onto the fence and tighten the set screw(s) as shown in Fig. 2. Then mount the sign using the supplied tamper-resistant bolt. It screws into the

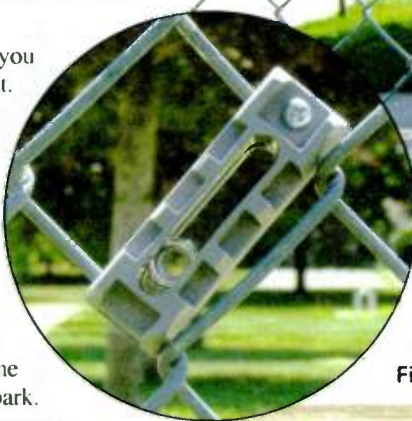


Fig. 1: The Sign Guardian clips to a standard chain-link fence, as shown at left.

Fig. 2: Align assemblies at opposing corners of the sign, above.

Fig. 3: A one-way security bit, below, is used to remove the sign.



Figs. 4 & 5: Two sides of the coin.

captured movable nut inside the Sign Guardian using a standard flat-blade screwdriver. Level the sign and then tighten down the bolts. A special bolt removal screwdriver bit is needed to unscrew the bolts, shown in Fig. 3.

The company also offers a version for clamping signs to posts, poles, gates or round tower members.

Front and back shots of the completed job are seen in Figs. 4 and 5. More information can be found at www.rfsigns.com. Steve Riggs is at riggs@isotope.im.

(continued on page 14)

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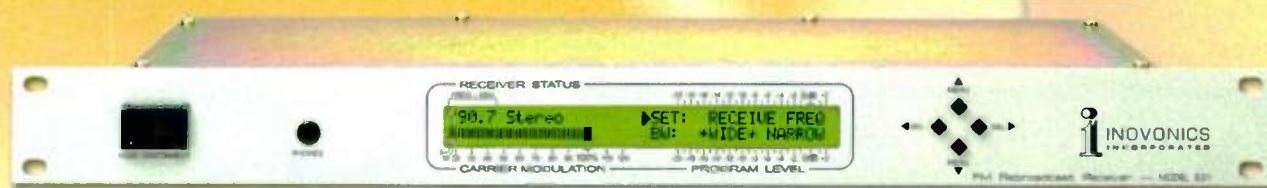
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Unless you're broadcasting from the moon, you'll probably find Internet just about everywhere you'll want to do a remote. IP is everywhere. And Z/IP is the best way to hear from everywhere. But hurry - supplies are limited.

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WORKBENCH*(continued from page 12)*

Consulting Engineer Lew Collins was one of many engineers who wrote in about Chuck Bullett's Hum Eliminator using the Western Electric 111C repeat coils. It's fun to see such an ancient relic solve a 21st century technical challenge.

Lew discovered that McCurdy Radio Ltd. (www.mcradio.com) manufactures a repeat coil, advertised as a replacement for the venerable 111C. It is their model MUK1A. Click on the Telco tab on their home page.

Lew has been doing a bit of research on repeat coils. They come in many impedance ratios and frequency response ranges. Only the 111C is suitable for most of our broadcast applications. The vast majority of repeat coils were used in toll-grade (300 Hz to 3 kHz) telephone circuits. The many dif-

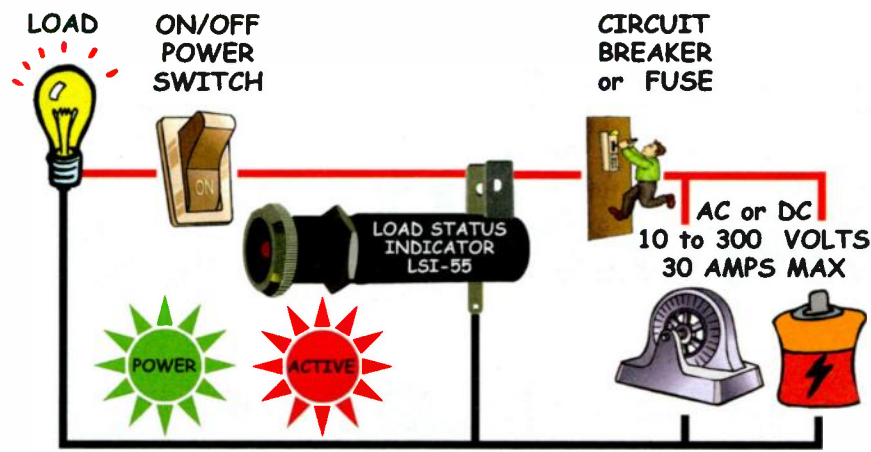


Fig. 6: The LSI-55 provides a load status indication.

ferent impedance ratios were to provide matching to various types of outside telephone plant wiring, both open wire and insulated cable.

Reach Lew Collins at lewisdyecollins@aol.com.

Here's another product for which I know you'll find a use.

Fig. 6 shows how the Load Status Indicator, model LSI-55, works. This new-generation pilot lamp/indicator illuminates green when power is avail-

able. When load current is greater than 1A, the indicator turns red.

Broadcast facilities have a number of situations in which the load being switched on and off is far from the control point. You may not be able to ascertain easily whether the load is actually active or not. Antenna heaters, tower lights and even that little STL RF pre-amp in the attic fall into this category.

The LSI-55 costs less than \$25! There are a number of models with different features, and you can find out more by heading to www.LSI-55.com.

John Bisset marked his 40th year in radio in broadcasting recently. He is a past recipient of the SBE's Educator of the Year Award. Reach him at johnpbisset@gmail.com. He can be reached at (603) 472-5282. Faxed submissions can be sent to (603) 472-4944.

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

MARKETPLACE**AUDIO ON THE EXPRESS:**

AudioScience, a kingpin of professional audio cards, has a new tuner card out. The ASI8821 is a PCI Express slot card capable of handling eight tuner modules. The card is available in four- or eight-tuner designs. FM tuners include RDS/RBDS monitoring as well. Each tuner is independently operable so that multiple sample rates, 8-48 kHz, can be handled on each card. Recording formats are PCM, MPEG Layer II and MP3. Drivers for Windows, XP, 7 and Server 2003/2008 are available along with Linux. An external antenna feed allows for improved reception. The card is compatible with AudioScience's ASIControl and ASIMixer card controller software. Info: www.audioscience.com



PORTABLE POWER: JBL has a new line of portable powered speakers aimed at small and mid-sized venues. The PRX600 family consists of



four full-range speakers and a pair of subwoofers. The subs use 18-inch drivers. All drivers have JBL's Differential Drive technology, onboard dbx Type IV limiters and DSP options. Power is courtesy of onboard Crown Class D amps. JBL says that the PRX600 family is 15 percent lighter and 20 percent smaller than predecessor speakers. Info: www.jblpro.com

THANKS FOR THE MEMORY: Germany's 2wcom, a maker of satellite receivers and distributed in the U.S. by viaRadio, announced an upgrade to the DSR0x family of digital receivers. The family



will now ship with Ethernet connectors for data/signal input in the event of a satellite reception failure. Additionally, the DSR01 has added internal memory for storing failover audio or to be programmed for use as local inserts and IDs. Current DS01 owners can have their units retrofitted by the factory. Info: www.2wcom.com

TRACKING THE USB LINK: Accessories, cable and widget maker Hosa Technology has added a new USB interface to its collection of useful tools. Tracklink has an in-line, rather than a box, design. That is, it is basically a 10-foot XLR cable with a USB connector at the male end with a small box near the XLR end. The box has a thumb-wheel gain control, 48V phantom power and recording LEDs. It should be compat-



ible with dynamic and condenser microphones and any DAW program. Performance is 16-bit/48 kHz. Price: \$69.95. Info: www.hosatech.com

HANDY RECORDER: Digital recorder maker Zoom has released its smallest recorder in the Handy Recorder line, the H1; it weighs two ounces and is the size of a candy bar. It mounts two microphones in an X-Y pattern and records up to 24-bit/96 kHz. It uses microSD cards as its recording medium and ships with a 2 GB card.

Power comes from a single AA battery. An optional USB/AC adapter allows for wired operation. A USB port facilitates downloading files. Other features include built-in speaker and low-cut filter. MP3 recording is also available, up to 320 kbps. A small back-lit LCD screen monitors performance. A basket protects the mics. Price: \$99. Info: www.samsontech.com



KICK THE STAND: It's aimed at use with kick drums, but the Primacoustic KickStand could prove useful for remotes at concerts,

sports events ... maybe railroad trackside interviews. It is a shaped piece of steel with a thick slice of acoustic-damping foam attached. The idea is that the foam, weight of the steel and the tongue shape create superior isolation from whatever the KickStand sits on. A threaded hole will accommodate standard mic stand/clip pipes. Retail: \$90. Info: www.primacoustic.com



STL and Audio Distribution

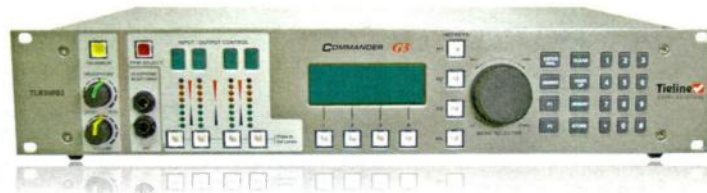
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SBE Lays Out Legislative Goals

FCC Expertise, BAS and Protecting the Name 'Broadcast Engineer' Are Priorities

BY BARRY THOMAS

The author is immediate past president and chair of the Government Relations Committee of the SBE.

The Society of Broadcast Engineers has as one of its chief purposes "to represent the needs of members before regulators and the industry." One of

SBENEWS

the most visible ways we've done that is through our relations with the government, the Federal Communications Commission.

The society has a long history of representing issues of technical interest of broadcast engineers. During the past few years the efforts of the Government Relations Committee have been refined, with a renewed focus on having a positive and direct impact on the individual SBE member. As part of that, the SBE Board of Directors ratifies an annual list of legislative goals to ensure the soci-

ety's efforts reflect SBE member needs and priorities.

The current legislative goals are post-

ed on the SBE website; see http://sbe.org/gov_index.php. The ratified goals for the 2009/2010 SBE Board term are:

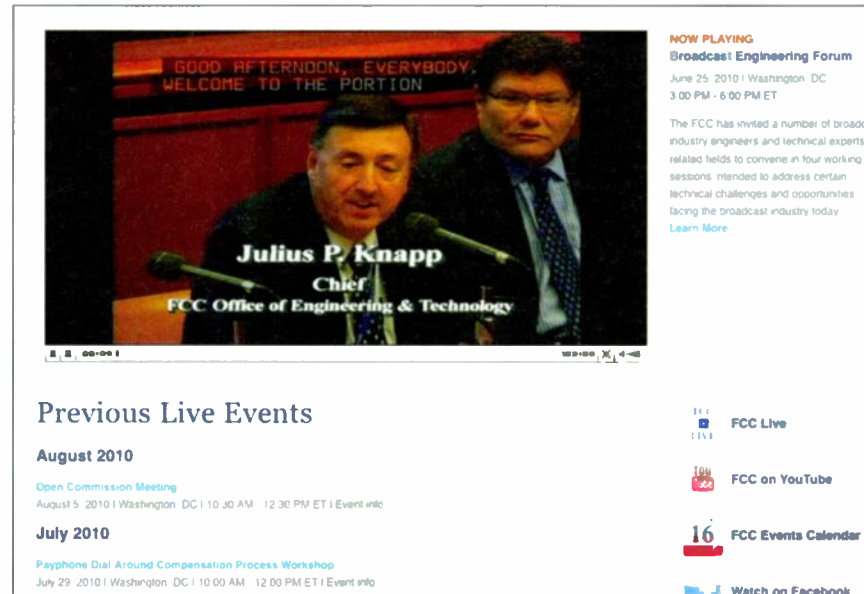
1. To protect the designation and capabilities of "broadcast engineers" from encroachment or abridgment

by state and local governments. Resist state and local government restrictions of the term "broadcast engineer" and the practice of "broadcast engineers." To also resist local and state infringement of broadcast engineers' authority to perform the work necessary to operate and maintain federally licensed broadcast facilities.

2. To protect the integrity of broadcaster access to frequencies designated as broadcast auxiliary service (BAS) spectrum; the principal that the FCC's real role in spectrum matters is to mitigate interference; and the unfettered access to public information provided by broadcasters (especially during emergencies and disasters) who rely heavily on broadcast auxiliary spectrum to transmit relevant images, audio and data. SBE resists the re-farming of BAS frequencies and encroachment of secondary users.

3. To promote the maintenance or increase of technical expertise within the FCC to ensure that decision-making by the FCC is based on technical investigation, studies and evaluation rather than political expenditures.

During times like these of extensive and creative new technology development, the FCC must have impartial and



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FCC Office of Engineering & Technology

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June 25, 2010 | Washington, DC
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The FCC has invited a number of broadcast industry engineers and technical experts of related fields to convene in four working sessions intended to address certain technical challenges and opportunities facing the broadcast industry today.

[Learn More](#)

Previous Live Events

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Open Commission Meeting
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July 2010
Payphone Dial Around Compensation Process Workshop
July 29, 2010 | Washington, DC | 11:00 AM - 12:00 PM ET | [Event info](#)

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The SBE secured an invitation to take part in the FCC's recent Broadcast Engineering Forum, shown here on the commission's website.



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exceptionally trained engineering and RF experts on staff to ensure applicant claims are reasonable and substantiated based on sound technical principals and commonly accepted good practices of experimentation and engineering. As opposed to typical legal issues, the reliance simply upon the adversarial process while ignoring technical facts is an insufficient and inefficient method of determining in an unbiased way the veracity and accuracy of new technical concepts and complex physics.

4. To promote a comprehensive and uniform federal preemption policy to all types of FCC regulated communication facilities.

5. To pursue the federal preemption of local and state RF exposure standards.

6. To pursue such other matters that are brought to the attention of the Government Relations Committee by members, the board or partners SBE is working with on its legislative agenda.

As you might imagine with this comprehensive list, the society is busy. Here are some of the issues we've been working with recently:

FCC Commissioners Technical Resource Act

This issue relates to the third SBE legislative goal, "to promote the maintenance or increase of technical expertise within the FCC."

You may remember the days when FCC commissioners were required to have engineers on their staff. This limitation was eliminated in the 1980s to improve the flexibility of the commissioners to organize their own staffs. Unfortunately, the result has been that the commissioners are now surrounded almost exclusively by lawyers and economists.

This has created a severe disconnect in two ways: Policy decisions may be made based on political expediency, economic opportunity or mathematical reasoning but lack an understanding of the harsh reality and physics of RF or the experience to ascertain the veracity of a proponent's technical claims. There is also a wide chasm between the decision-making policy branch of the commissioners' offices and the vast institutional and engineering knowledge and expertise at the FCC bureaus.

The SBE has noted a number of FCC policy decisions that were made against the recommendation of the FCC bureau experts and that seemed to have been based on political rather than technical grounds.

Engineers at the policy level of the FCC would help ensure that commissioners have valid technical guidance but

could also provide a valuable communications conduit between the FCC bureaus and the commissioners.

In December the SBE was approached by the staff of Sen. Olympia Snowe (R-Maine) to support S.2881, a bill that would allow each FCC commissioner to add a member to their staff but would require that the new member be an engineer or computer scientist. The society has fully engaged with this effort through press and education efforts and even visits to Capitol Hill to speak to prospective co-sponsors.

Initial efforts were very promis-

ing. The Senate bill was scheduled for markup very quickly and, immediately following our Washington visit, a companion bill in the House, H.R. 4809, was introduced.

Unfortunately, the window of opportunity for this session of Congress may be closing due to the congressional summer recess, the fall mid-term elections and the end of this session of Congress, which comes early this year. Though the Senate version of our bill has been favorably reported out of committee with a recommendation that the bill pass the Senate, the House bill has not gained a significant

number of co-sponsors and time is running out for activity. The majority and minority in the House have not been able to come to agreement on a "package" of FCC reform bills, and ours is swept up in that dispute. If the bills do not pass in the few legislative days left in this session, we are optimistic that they will be reintroduced in January. We urge you to contact your senators and representatives about this important legislation. Everything you might want to know about this issue is at the SBE website at http://sbe.org/gov_issues.php.

(continued on page 18)

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Audio Innovators Recall Emil Torick

He's Best Known for the Audimax,
Though His Work Ranged Well Beyond

BY TOM VERNON

When one traces the origins, art and science of broadcast audio processing, the work of Emil Torick stands out.

Engineer, scholar, inventor, once CBS vice president of audio technology, he was perhaps best known for the development of the CBS Audimax, considered by many the first true audio processor. It was the first device to incorporate a gain platform, overcoming many of the obvious processing artifacts of previous devices.

Torick passed away unexpectedly at his Santa Barbara, Calif., home in June at the age of 78.

He had lifelong interests in music and technology. Starting in 1958, he had a chance to pursue both when he moved from Pittsburgh to Connecticut and began a 28-year association with Stamford-based CBS Laboratories, the technology R&D entity later known as CBS Technology Center.

His research there led to the awarding of 16 U.S. patents, many for audio processing circuits, as well as the publication of more than 60 technical articles. After holding a number of tech and marketing titles, he was named vice president of audio technology. He also served as director of R&D for the CBS Musical Instruments Division, which included Steinway pianos, Fender guitars, Rodgers and Gulbransen organs, Lyon and Healy harps and Gemeinhardt flutes.

Torick is regarded by many as a founder of modern broadcast audio processing technology, remembered fondly by later designers.

'THE HEADWATER'

"Emil was named moderator of a recent AES audio processing panel," recalled Glen Clark, developer of the Texar Audio Prism, "because it was felt that he was the headwater from which all else flowed. ... Some of the personality of the Texar M-100 card came from Emil's influence in the Audimax."

Eric Small, chief technology officer of Modulation Sciences Inc. and a co-developer of the Orban Optimod, encountered Torick around 1964 while installing CBS processing gear at WNCN(FM) New York.

"Things weren't working the way we expected. Enter Emil and the beginning of me asking dumb questions and Emil patiently teaching me.

"Nothing much changed throughout the rest of our careers," Small said. "I was always a bit in awe of him. Emil

was always a gentleman, always willing to take the time to explain and teach."

Audio processing innovator Bob Orban called Torick a "legend in our industry." Orban's colleague Greg Ogonowski said the CBS boxes were "the force to be reckoned with for a long time."

Bill Sacks, now a self-described "Optimod mechanic," recalled an "extraordinarily friendly guy who loved to share stories about his CBS Labs days. He was the first to understand psychoacoustics and apply it to processing. The Audimax was a groundbreaking device, incorporating both the Gated



SBE

(continued from page 17)

Broadcast Auxiliary, BAS

As part of government relations, in conjunction with our unique program of frequency coordination, we are coming to the end of the landmark 2 GHz relocation plan. Sprint/Nextel partnered with MSTV and the SBE to make this almost-insurmountable task a reality. There are lots of thank-yous to go around with this program, not the least of which are for SBE frequency coordinators and TV stations across the U.S. who helped make this an orderly transition.

Individual SBE chapters continue to wrestle with the thorny issues related to dwindling frequencies for wireless microphone operations and expanded operation of AWS operations near broadcast 2 GHz frequencies. Frequency Coordination Chair Joe Snelson has a big handful of issues to work with.

EAS

The SBE's government relations efforts include participation in the ongoing Emergency Alert System improvements although the heavy lifting is being done by the EAS Committee itself.

This includes participation in OASIS ratification of the CAP standard by EAS Committee member Gary Timm of SBE Chapter 28.

The SBE presented a free Webinar on Aug. 19 to provide some of the critical information for broadcast engineers to prepare their operations for changes. Keep an eye out for e-mail and SBE website announcements for a follow-up webinar on this important educational opportunity.

FCC Broadband Plan

Although this issue may have an immediate impact on our brethren in television, it is the proverbial broadcast "elephant in the room."

The current FCC and presidential administration have committed to wide deployment of broadband services to Americans. This is truly a laudable objective but the FCC has taken aim at broadcasting to help satisfy the need for RF bandwidth.

Specifically the FCC wishes to obtain 120 MHz of spectrum currently used for free over-the-air TV and reallocate it by auction for broadband delivery services.

On June 25, the FCC convened a "Broadcast Engineering Forum." The purpose of the meeting was to discuss four specific considerations of accommodating television broadcasters: cellular-type signal distribution; methods to repack TV band so the current number of TV channels could be delivered using less spectrum; advances in VHF reception; and video compression technologies.

The forum was composed of two parts, a morning meeting of workgroups followed by a public session in the afternoon where the results of the workgroups' efforts would be announced.

When the forum was announced, the SBE felt our members should be represented at this important meeting. Although many skilled and influential broadcast engineers were invited to participate, the society was disturbed that there seemed to be resistance to participation by the singular organization chartered to represent broadcast engineers. SBE President Vinny Lopez released an open letter to FCC

Gain Stabilization (GGS) and return to zero circuits. It was the first leveler to address the noise-pumping artifacts of earlier processors, and was fully invisible when set up properly.

"It is a testament to his design that 40 years after their creation, I still get Audimax processors sent to my shop for rebuilds."

Consultant David Bialik was the one who invited Torick to participate in recent AES panels about loudness and the history of audio processing; he deeply admired Torick as an audio designer. "Also he was an accomplished player of the violin who introduced me to the music of Mozart."

Torick was born near Pittsburgh in late 1931. He served as an Air Force officer in Korea and worked as a freelance violinist and organist-choir director; he played with the Pittsburgh Symphony

(continued on page 20)

Chairman Julius Genachowski protesting the society's exclusion from the meeting and articulating concern that the study process lacked transparency.

Shortly afterward, the FCC extended invitations to the SBE. Vice President Ralph Hogan and Frequency Coordination Chair Joe Snelson participated in the workgroup sessions and attended the public afternoon session.

A playback of the public session is available at the FCC Video Archives at <http://reboot.fcc.gov/video-archives>. Other information from the meeting is posted at the FCC website for the event, <http://reboot.fcc.gov/workshops/broadcast-engineering-forum>.

The SBE has not taken an official position on the TV channel reallocation issue, but as with issues like frequency coordination and EAS, our members have core competence with technical issues and can provide reason and technical direction to complex issues.

While the society expects to be involved with further discussions on this issue, the SBE's primary commitment is to provide education and information to our members so broadcast engineers can respond appropriately. Suffice it to say, this is an issue we'll be watching closely.

There is always more to learn about these issues and the many others the SBE works with. We encourage you to visit www.sbe.org for more details on the society's legislative and government relations efforts, updates on the current issues and educational opportunities.

Barry Thomas, CPBE, CBNT, is vice president of engineering for Lincoln Financial Media.

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TORICK

(continued from page 18)

and directed the first televised concert of the symphony for the local public television station.

A graduate in music from Duquesne University, he also held a BS degree in physics from the University of Pittsburgh and an MBA degree in business administration from the University of Connecticut.

DIVERSE CONTRIBUTIONS

Many consider 1959 to be the birth date of modern audio processing, as that was the year that CBS introduced the Audimax I. Costing about \$1,000, it was the first device to hold audio level constant over a 6 dB gain platform, making the processor sound less busy. This was followed shortly by Audimax II, which added an adjustable noise gate that froze gain when the input level fell below a preset threshold. The Audimax II-RZ added a return-to-zero circuit. Next came the Audimax III, which transitioned the device to solid-state circuitry.

Shortly thereafter, Torick and the CBS researchers developed the AM and FM Volumax as complimentary peak limiters. First came the 400 AM and 410 FM units. The FM Volumax was one of the first devices to control the pre-emphasized part of the audio above 2 kHz in a separate sidechain, resulting in a more natural sound. The product later evolved into the slimline 4000 AM and 4100 FM Volumax.

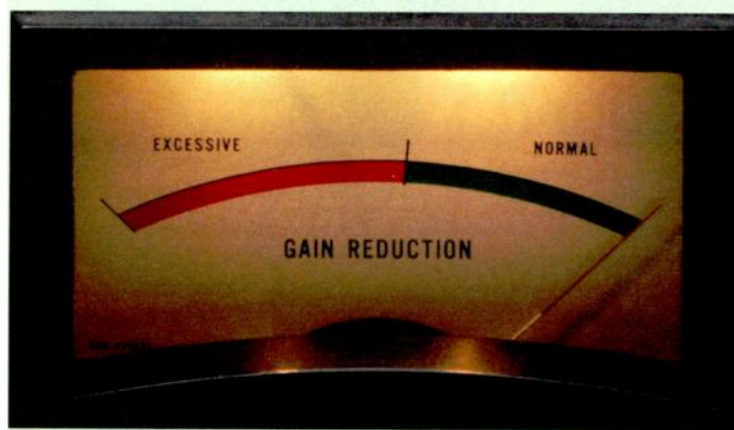
The Audimax and Volumax are also remembered for their "mystery modules," key bits of circuitry shrouded in potting compound and small metal cans. The practice continues today in Orban processors and other broadcast gear.

Throughout these early years, CBS sold the Audimax with a 30-day, money-back guarantee, a marketing strategy that broke through some of the resistance to a new technology. The high price was still an issue, however, and it wasn't till the less-expensive 400 series was introduced that sales really took off.

In 1975 the product line was sold to Thompson, which marketed 1 RU Audimax and Volumax under the Thompson-CSF Labs logo.

For about a decade, the Audimax and Volumax enjoyed top billing in the processor market. However, the technology had taken single-band audio processing about as far as it could go. In 1971, Mike Dorrough introduced the DAP (Discriminate Audio Processor), and the age of multi-band processors began.

While Torick is best remembered for his work on the Audimax, many other CBS Labs products incorporated his mastery of both psychoacoustics and electronics. The theory sections of many CBS manuals provide an excel-



Bundid Niyomtham and Greg Ogonowski

'The warm glow of the CBS Volumax 'Red/Green Junction' will live on in memory of Emil Torick, CBS Laboratories,' wrote Greg Ogonowski, who said Torick's work inspired designs at Gregg Laboratories and Orban. 'The CBS Volumax peak limiter, together with its companion AGC, the CBS Audimax, were the most popular broadcast audio processing systems in the 1960s and early 1970s. ... The FM and Recording Volumax were the first audio limiters to use high-frequency control before clippers to control peaks while minimizing high-frequency distortion. This would be the basis for all commercially successful limiters to come for many years.'



lent background on the development of processing technology.

The model 700 Loudness Meter was the first device to give a visual indication of the relative loudness levels of broadcast programs. The limitations of VU meters for monitoring program loudness had long been understood, and the existing Fletcher-Munson loudness contours were not applicable to broadcasting.

Torick's research resulted in equal loudness contours using pink noise, and defined physiological loudness in terms of frequency content, linear summation of octave bands and the ballistics of the hearing mechanism. The revised CBS loudness algorithm of 1981, developed by Bronwyn Jones and Torick, has been translated to DSP and is included in the software-based Orban Loudness Meter.

Building on this research, Torick, along with Jones and colleagues, developed the CBS 710 Automatic Loudness Controller as a novel type of limiter.



Rather than using an AGC loop with voltage sensing, the 710 used "loudness sensing," and only reduced gain when a preset "loudness threshold" was exceeded. The 710 was popular with television stations, under fire from the FCC for airing commercials that sounded louder than program material. These innovations live on in the Orban Optimod TV 8585, which incorporates both the CBS loudness meter and loudness controller.

Poor-quality voice programs could be improved with the CBS 4500 Dynamic Presence Equalizer. Psychoacoustic research at CBS determined that most of the energy in speech is contained in vowels, generally in the 100–1,000 Hz range, while most information in speech is conveyed by consonants, which usually fall into the 2–4 kHz band.

Since these higher frequencies are more rapidly attenuated with distance than are low-frequency components, the character of speech changes with dis-

tance. Speech heard at a close range, where high-frequency energy is abundant, is said to have presence, hence the name of the band.

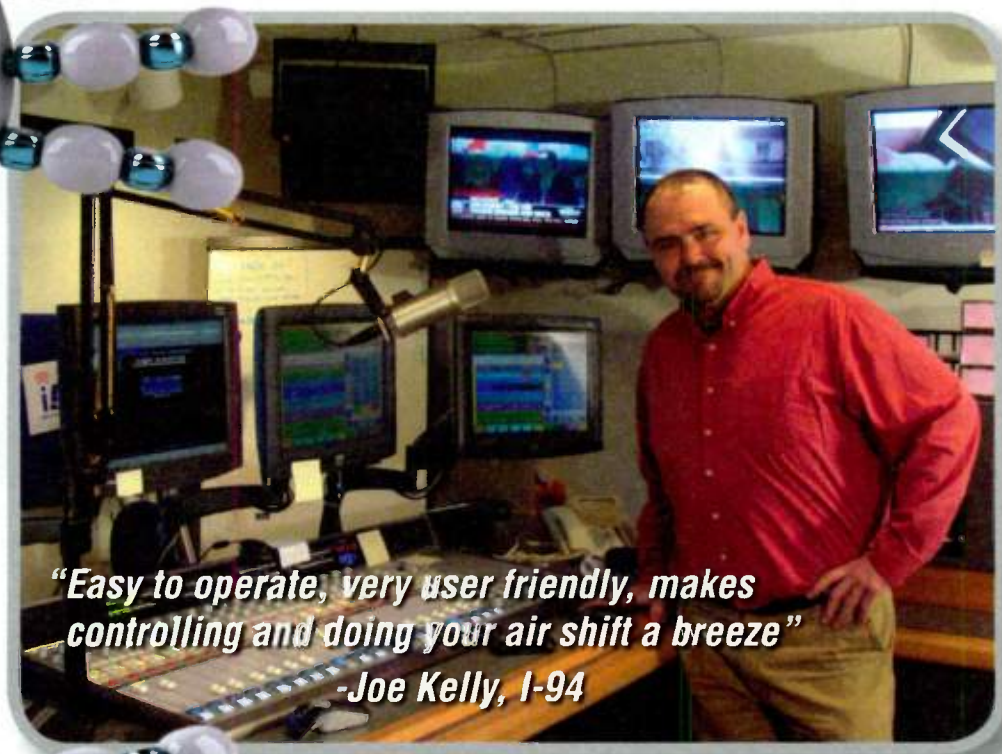
Sound levels for consonants are typically 15–20 dB below those for vowels, but the ear usually compensates for this. In extreme cases, as in poor-quality voice circuits, this is no longer possible.

The Dynamic Presence Equalizer compensates for reductions in the presence band level during speech broadcasts. A speech-music discriminator would remove the equalizer from the path during musical passages.

FMX

When the FCC approved 125 percent positive peak modulation to enhance the loudness of AM stations, Torick and his associates developed a revised AM Volumax to take advantage of the new rules.

(continued on page 22)



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-Joe Kelly, I-94



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TORICK

(continued from page 20)

The 4000 Volumax was developed with an innovative logic circuit that reversed peak polarity if negative peaks were higher than positive.

In the early 1970s, Torick was involved with quadrasonic sound, helping to develop the SQ matrix system, which was used in the encoding of CBS quad records and was proposed as a standard for FM broadcasts. By the time the FCC decided on a standard for four-channel broadcasts, however, interest in the technology was waning.

When the CBS Technology Center closed in 1986, Torick became president of Broadcast Technology Partners, an organization established by CBS, the National Association of Broadcasters and an investor group to license new technology in FM broadcasting to the consumer electronics and broadcast industries.

While at BTP, Torick, working with Tom Keller of the NAB, developed FMX, a system aimed at improving FM stereo transmission quality.

Benefits of FMX, according to Torick, were reduced noise levels, extended stereo separation and greater range than conventional FM broadcasting when received by FMX-capable tuners. The system also was backwards-compatible with existing standards.

FMX quickly became a source of controversy. MIT professor and founder of the Bose Corp., Amar Bose, devel-

oped a mathematical model of FM multiplex and conducted field tests of FMX, concluding that the proposed system actually would degrade the quality of stereo reception, whether received by FMX or conventional receivers.

Torick countered that the Bose research was flawed, and cited numerous stations having success with FMX. But following the Bose controversy, interest in FMX gradually faded.

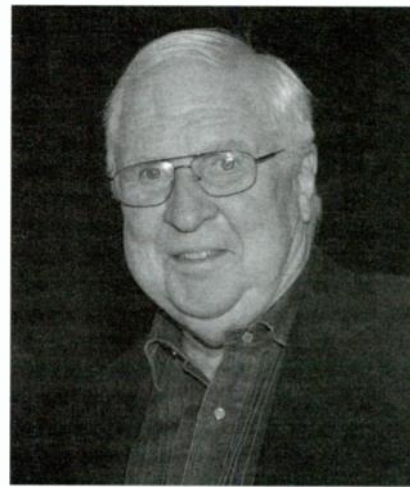
Tom Keller said, "At that point we needed more money for additional R&D, but there were limited funds and licensing problems. Even though we had some very successful stations, the system died a slow death."

MUSIC AND MORE

During his career Torick worked as chief technical advisor on recording technology and digital transmission media for the Recording Industry Association of America, and he consulted to the Consumer Electronics Association. He also served on the National Radio Systems Committee.

Under State Department auspices, he was a member of the U.S. delegation to the International Radio Consultative Committee in Geneva, and worked for 12 years as U.S. chairman of one of its technical groups. In the FCC Inquiry on Digital Audio Broadcasting, he represented the Eureka-147 Consortium of government and industrial organizations from four European countries.

Torick was active with the Audio



Courtesy AES

Torick is shown last fall in New York, where he received the AES Distinguished Service Medal.

Engineering Society throughout his career; he was awarded a Fellowship in 1969 and its Bronze Medal in 1984. In 1979 he was named an Honorary Member and in 2009 was awarded the Distinguished Service Medal, one of its highest honors.

During a term as the society's president in the late 1970s, Torick laid the groundwork for AES Technical Standards activities. He served as president of the AES Educational Foundation from its establishment in 1984 until recently. The foundation has awarded nearly 200 grants for graduate study in audio engineering.

Among other accomplishments he

was assistant concertmaster of the Norwalk Symphony for many years; he continued to perform on violin and organ, and was involved with organizations of chamber musicians, organists and music enthusiasts in Connecticut and California. Following his retirement in 1979, Torick moved to Santa Barbara, where he continued his consulting practice on a limited basis.

According to his son Lou, who owns a violin shop in Chicago, Emil Torick also worked to bring quality concert programming to his new community through his leadership of the Santa Barbara Music Club.

Frank Foti, president of Omnia Audio, remembers Torick for his panels and workshops on processing at AES as well as his ability to bring people together.

"Processing has become a very competitive market, and sometimes we had less-than-positive thoughts towards our fellow panelists. But Emil stayed above all that, was on a first-name basis with everyone and saw the potential in just about everything. I believe there's a lesson there for all of us."

Recalling those sessions, Marvin Caesar, former president of Aphex Systems, said of Torick, "Out of the corner of my eye, I noticed him smiling during the presentations. He did appreciate how far audio processing had come from his days at CBS and he had no ego about all his contributions to modern processing. He was truly a gentleman and a scholar."

Tom Vernon is a longtime RW contributor.

In 2005 RW contributor Charles "Buc" Fitch recalled the Audimax and Volumax. To read it, visit radioworld.com, keyword Audimax. Scans of CBS manuals are available on Harold Hallikainen's broadcast history site at www.hallikainen.org/BroadcastHistory/.

NEWS ROUNDUP

DIGITAL POWER: About 86 FM stations have increased digital power, according to the NAB. Its Radio Tech Check newsletter searched the FCC's Consolidated Database System Electronic Filing System and arrived at that number. It turned up 51 commercial and 35 noncommercial stations that have raised HD Radio power since the FCC authorized an increase in January. The majority of stations are operating at -14 dBc, the "blanket" authorized power level for most stations; seven FMs are operating in excess of -14 dBc, with six having increased to the maximum allowed -10 dBc.



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Riding Gain at WMAQ

How many engineers does it take to run a radio program?



Apparently, it took four of them in 1925. This scene from the WMAQ control room in Chicago shows four studio engineers hard at work in the days before consoles and audio processors.

The man on the left has his hand on the volume control of a Western Electric line amplifier, and is apparently "riding gain" on a studio broadcast.

The audio sources were carbon microphones in the studio, selected one at a time with telephone key switches on the audio panel.

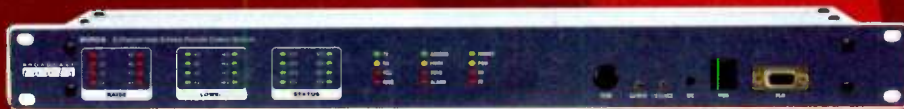
There are two other Western Electric audio panels in the room, perhaps controlling Studio "B," incoming remote phone lines or the outgoing feed to the transmitter.

Of interest are the horn monitor speakers and the row of batteries on the floor, which were the "A" and "B" voltage supplies for the audio panels.

In 1925, WMAQ was owned by the Chicago Daily News with its studios and transmitter located in the LaSalle Hotel. The station used a Western Electric 106A 1 kW transmitter that fed a "T" type antenna on the roof.

John Schneider is a lifetime radio history researcher. This is one in a series of photo features from his collection. Write him at jschneid93@gmail.com Comment to radioworld@nbmedia.com.

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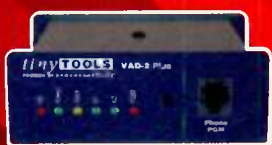
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Hip Hop Lives ... on Omnirax Furniture

'Power 106' Hops Onto Customized Cabinetry for Three-Studio Project

USERREPORT

BY SAUL PEREZ
Chief Engineer
KPWR(FM) Radio

LOS ANGELES — Today there is a large selection of knockdown studio furniture components available that allows anything from a small home studio to large complex studio configurations to be built. These ready-made modular pieces make it easier than ever to build a professional-looking studio.

Many factors must be considered when deciding on custom-designed and -built studio furniture, such as room size, shape and any special needs that will ultimately define the function of the studio.

At KPWR(FM) in Los Angeles we had three very different studio projects, each with its own challenges and furniture needs. The three studios — a mix room, a morning show production studio and a network operations studio — were in varying shapes and sizes with distinctively different functions.

'BIG BOY'S NEIGHBORHOOD'

The mix room is a stand-up studio for DJ mixers that is utilized about 14 hours a day. The mix room studio furniture needed good sightlines with the on-air studio, a specific counter height, ample



tracking and backup air studio.

Of the Omnirax offerings, their custom-designed studio furniture best met the needs and unique functions of our three studio projects.

New Omnirax Desks and Racks at KPWR

tabletop space for DJ equipment and enough rack space for ancillary equipment.

The morning show production studio serves the fast-paced needs of the nationally syndicated "Big Boy's Neighborhood." This studio's furniture needed to accommodate a 20-frame audio console along with a digital audio workstation and several racks for recording/ancillary equipment.

The network operations studio controls the affiliate feeds for "Big Boy's Neighborhood." It is the smallest of the three studios and also functions as voice-



We started with a hand sketch of each room with dimensions and an initial concept of the furniture. Several Web meetings were scheduled to work with Omnirax's designers in real time

to create three-dimensional CAD drawings as we watched and commented. Special features were added to each studio design to incorporate compartments for Krone blocks, cable trays and mobile equipment racks.

The completed drawings were sent to us in PDF form for printing and submitted to the programming department for review. Omnirax was able to update the designs quickly based on our input to reach final approved drawings.

One tremendous hurdle we had to overcome with our studio projects was how to minimize downtime because the morning show production and network operations studios are used five days a week. The mix room is used seven days a week. Omnirax's custom furniture is built in a knockdown fashion that allows for easy assembly and disassembly yet, when assembled, does not have the knockdown furniture look. Their sleek design and rounded counter top corners make for a professional finish.

Upon receiving all of our furniture, it was assembled in a storage room where custom wiring harnesses to interconnect all equipment were fabricated by Immaculate Connections (www.icwiring.com).

Since the Omnirax knockdown furniture and the custom harnesses allowed for simple disassembly and relocation, consequently, each studio was "burned in," thoroughly tested, disassembled, moved and reassembled. This process reduced the actual downtime for each studio from about two weeks to less than two days.

All work for the installation of each studio was done over a weekend because everything was prewired and debugged.

For information, contact Philip Zittell at Omnirax in California at (800) 332-3393 or visit www.omnirax.com.

ABOUT BUYER'S GUIDE

Radio World publishes User Reports on products in various equipment classes throughout the year to help potential buyers understand why colleagues chose the equipment they did. A User Report is an unpaid testimonial by a user who has already purchased the gear. A Radio World Product Evaluation, by contrast, is a freelance article by a paid reviewer who typically receives a demo loaner. Do you have a story to tell? Write to bmoss@nbmedia.com.

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Harris Provides Turnkey Studio Designs for Schurz Project in South Bend

USERREPORT

BY JIM ROBERTS
Vice President and General
Sales Manager
Schurz Communications

SOUTH BEND, IND. — WSBT(AM) and WNSN(FM), owned by Schurz Communications, recently moved into a new, shared broadcast facility with Schurz-owned WSBT(TV).

The move allowed Schurz to consolidate operations into a single facility and create new studio layouts for each station from scratch.

Schurz Communications wanted to build showcase studios for WSBT and WNSN, which have been on the air for about 90 years and 50 years respectively. The goal was to create something special to respect the history and heritage of each station.

Management elected to work with Harris for turnkey studio design, installation and pre-engineering services, as well as a range of studio furniture and accessories, audio networking equipment and on-air and production consoles.

PLANS

The Austin Group served as the general contractor for the entire building, providing initial floor designs for the studios along with soundproofing and other services. The plans were delivered to Nick Van Haaster at Harris, who assisted with furniture designs, wall configurations, acoustical treatments and wiring strategies.

A total of nine radio studios were planned, consisting of three on-air studios, two production studios, two voice



tracking studios, a news booth and a producer's booth for WSBT. The third on-air studio is for WHFB(FM), which Schurz operates but does not own.

The building is divided in half, with radio and television on opposite sides. The news booth is part of the TV newsroom design, and is the only radio studio separated from the rest of the operation.

Nick and his team did an outstanding job of executing the big picture concepts. This included an open concept that provided excellent sightlines between guest and host positions in the on-air and production studios; as well as a clean and modern look and feel for all studios.

The initial floor plans provided two areas of free space for the larger studios. The Harris team added two non-

perpendicular walls to create angles for enhanced noise reflection, minimizing echo in the on-air studios. Sound treatment was added to the other two standard walls, creating an environment for high-quality studio audio at an affordable price.

Harris designed custom Smoothline furniture for each studio, with built-in wiring harnesses to expedite installation. The project had an accelerated timeline, with radio installations planned over a one-week period. The predesigned harnesses eliminated onsite connections, creating a plug-and-play situation. The harnesses were configured within punchblocks in the furniture to keep everything neatly arranged.

Stand-up furniture designs were customized for WNSN, a music station with a livelier atmosphere. The furniture accommodated five positions (three hosts and two guests) and stands 6.5 inches taller than the WSBT on-air furniture. The stand-up design also provides additional rack space for CD players and other components required

(continued on page 29)

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Congratulations to Buc Fitch, the Society of Broadcast Engineers' Educator of the Year for 2009-2010, from Radio World and his colleagues who have received recent SBE National Awards. And our thanks to the Society of Broadcast Engineers for recognizing their work.

World Radio History

WhisperRoom Makes Room

Canadian School Finally Gets a Quiet Space for Broadcast Studio

USERREPORT

BY RICHARD STROOBANT

The author is instructor of radio, television and broadcast news at Southern Alberta Institute of Technology.

CALGARY, ALBERTA — The “studio” we were using at Southern Alberta Institute of Technology to do commercial voice-overs had a large ventilation fan in the ceiling, along with a couple of computers humming in the background. Not really the ideal setting for voicing.

After several attempts at fixing the vents and enclosing the computers, we found out about a WhisperRoom portable sound isolation enclosure on campus. Someone was using it for corporate video narration.

with the ventilation fan running. I do miss the sound of voicing in a larger room, but when you are faced with the problems we had in our situation, the WhisperRoom was the answer.

The enclosure has been easy to put together, take apart and put back together (because of renovations and moving

the WhisperRoom, we've done it three times). It's basically a 4-by-6-foot sound-proof shed. It has a door and a large window for communication. The Velcro-attached Auralex acoustical foam panels can be placed throughout the interior for improved sound dampening.

It is heavy; a single person can't

handle it alone. Optional casters would help solve that problem.

When industry professionals come in for a tour of our new facilities, they comment on how they wish they had one of these and always ask how good they are. For a college teaching radio, for a radio station needing a voice booth, for someone wanting a home studio, it's perfect. I recommend it highly.

For information, contact **WhisperRoom** in Tennessee at (423) 585-5827 or visit www.whisperroom.com.



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Our students use it for broadcasting. Our campus station is radio.sait.ca and everything that is on the station our students write, voice and produce. Almost all of the voiceovers on the station are done in the WhisperRoom. Our students also now do projects for “Crimestoppers,” and those PSAs run on our local commercial radio stations in this city.

The booth is extremely professional, and with the Neumann TLM-103 mic in there, it sounds amazing, even

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The Emcor Enclosures FP1 console offers a flexible, functional solution for monitoring applications. The console features a durable, two-tier modular design built for flat-panel monitor technology.



The FP1's modularity and accessory options, including articulating flat-panel monitor arms, allow customers to create almost any workstation configuration, according to the manufacturer.

Its ergonomic, open-architecture and spacious work surfaces, with protective T-edging, promote operator comfort and productivity. Cabinet space beneath the work surface, including 19- and 24-inch rack-mount capability, makes the console suitable for setups requiring large amounts of hardware and extensive wiring.

Emcor recently switched to a powder-paint finishing system that it says is more environmentally-friendly and improves finish durability. The company offers a variety of standard colors, including antique white, neutral, graystone, Caribbean blue, fawn, steel, putty, hi-tech gray and black. Custom colors can be handled.

The FP1 and other Emcor standard products can be modified based on customers' needs.

For information, contact Emcor Enclosures in Minnesota at (507) 287-3535 or visit www.emcorenclosures.com.

ENGLEWOODWORKS OFFERS HEIGHT-ADJUSTABLE CONSOLE DESK

Englewoodworks has built custom studio fixtures since 1975 for corporations, educational institutions and broadcast facilities including public radio and TV. Its custom work includes broadcast fixtures and racks, edit/production suite furniture, reception areas and height-adjustable lecterns.



The company gave a recent example of how it matches a product with specific needs: a height-adjustable broadcast desk/console for stand-up or seated broadcasting; the height is adjustable from 30 to 46 inches with the push of a button. The overall footprint is 11 by 5 feet; a 10 RU upper rack follows the height movement.

At WYMS(FM) in Milwaukee, the front edge hangs over 11 inches to facilitate guest positions. Axia mixers were used here, and some of the companion cabinetry was custom built.

Custom wood finishes and sizes are available. Units are available in cherry, oak and natural maple. Most units come with Avonite solid-surface tops. For installations desiring LEED credits, Ritclite prod-

ucts are used. This design meets ADA standards and is great for those with disabilities or back pain.

Pricing for a complete unit is approximately \$12,500 installed.

For information, contact Karl Berndt at Englewoodworks in Wisconsin at (715) 268-4641 or visit www.englewoodworks.com.

ACOUSTIC SURFACES THROWS A CURVE

Acoustic Surfaces is a new player in the acoustical treatment market. The Minnesota-based company has a product group for professional contractor and retail use, Acoustic Geometry; its first line is The Curve System.

The Curve System consists of diffusers, an absorber and a corner trap. All are designed around a gentle curved shape that the company says is more reminiscent of molding than more traditional flat or sharp-angled acoustic treatment products.

The 42-inch long Diffusor comes in three sizes, small (13.5 x 5 inches), medium (21 x 7 inches) and large (30 x 10 inches). These are constructed with internal bass traps made from a "mass-loaded vinyl membrane." Expected performance is 40-300 Hz absorption and diffusion in the 300 Hz-20 kHz range.

The Absorber (42 x 21 x 4.5 inches) will work in the 200 Hz-20 kHz range while the Corner Trap (42 x 21 x 18 inches), resembling a large piece of quarter-round floor molding, follows the specs of the Diffusor.

For information, contact Acoustic Surfaces in Minnesota at (888) 227-6645 or visit www.acousticgeometry.com.

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SCHURZ

(continued from page 26)

for the music format.

WSBT is a talk station with a seated furniture design in the on-air studio to accommodate five positions. The producer's booth faces the on-air studio, and the producer and host can visually communicate based on the intelligent design and layout.

DESIGNS

The Harris SmoothLine modular furniture designs for the on-air studios include two turrets for various components and accessories (clocks and timers, dump buttons, CD players). The turrets can be moved around the surface to accommodate changes to live shows or room functions. Underneath rack systems house additional components including EAS units.

The surface of the furniture features built-in cough button panels with sleek profiles, as well as Harris RMXdigital on-air consoles, VistaMax routing panels for studio networking and World Feed Panels for connecting field recording and playback devices. Telos 100 digital hybrid phone panels are built into the consoles to maintain a clean feel and look on the Smoothline surface.

The on-air and production designs are color-coded per request. The WNSN furniture features a blue countertop with white guest wings; the WSBT design is the exact opposite. The production studio furniture features an earth-tone brown color, accommodating four positions per room.

The two voice tracking studios landed in tight spots and feature slide-out racks under the furniture surface so engineers can rotate the racks to access equipment for maintenance. Harris StereoMixer digital consoles were added to these studios along with VistaMax audio routing. The VistaMax system delivers the control and flexibility each studio needs to bring in audio sources from anywhere in the building.

The furniture designs in all studios have proved durable, with professional and attractive solid-surface countertops and a minimal number of posts for support. All of this lends to an uncluttered appearance that enhances the on-air and production environments for both stations.

For information, contact Scott Grueninger at Harris Broadcast Communications in Ohio at (513) 459-3400 or visit www.harris.com.

TECHUPDATE

STUDIO TECHNOLOGY FOCUSES ON BROADCASTERS

Studio Technology designs, constructs, delivers and installs studio furniture for the broadcast industry nationwide.

Design and construction expertise enables the company to provide a range of standard and custom furniture to customers. According to the company it can provide a simple custom configuration that is price-competitive with modular furniture, as well as higher-end furniture using solid surface or other alternative materials.



Because individual needs can differ, Studio Technology says it likes to work with a customer to develop a design that fits the operational needs of each studio along with meeting the client's budget. Based near Philadelphia, it has provided furniture for single-room studio renovations as

well as major consolidation projects on both coasts and in Hawaii. The company promises to work with any architect, systems integrator and local staff and provides delivery and installation of the furniture it manufactures.

For information, contact Studio Technology in Pennsylvania at (610) 925-2785 or visit www.studiotechnology.com.

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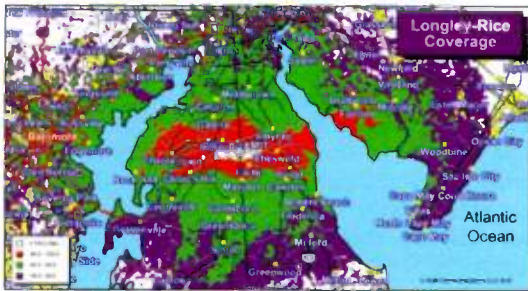
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Common Misconceptions About FM Antennas

Advocate of a Single-Lobe Design Pushes for 'Site-Specific Engineering'

COMMENTARY

BY LEE GRANLUND

The author, a former engineering executive for several broadcast owners, is a consultant in signal quality improvement and antenna system design. Clients include SWR Inc.

I have written in Radio World (Dec. 3, 2008, *Readers Forum*) about coverage-area benefits to stations of the SWR Illumitron antenna; its proprietary technology eliminates side lobes and puts more than 99 percent of a station's signal on the horizon, toward the market area and the audience.

The topic prompts some broader thoughts about how stations choose antennas.

One of the most significant factors determining the success or failure of any FM broadcast station is the quality and coverage of its signal. A station that does not provide a clean, interference-free signal throughout its market area cannot expect high numbers in audience share or

in revenue, regardless of programming.

Many FM stations have limitations regarding available transmitter site or power; however, an even greater number of stations suffer from inadequate coverage due to poor antenna performance.

The result of poor antenna performance is simple, but the cause is often complex.

The result of poor antenna performance is simple, but the cause is often complex and subject to many common misconceptions:

1. "All FM broadcast antennas are pretty much alike." Although they may look alike and have similar performance specifications, various makes and models may behave in very different ways in specific environments, due to subtle design differences.

2. "A competent engineer can select the best antenna for my station by comparing published specifications." In almost every case, the tower and other factors affect the antenna pattern and performance as much as the antenna itself. Overall results of any specific combination of antenna, tower and site environment can be determined only by actual measurement or by an accurate computer model of the entire installation.

3. "Replacing an older antenna with a newer model will correct most signal quality and coverage problems." It is possible; however, this may only replace old problems with newer ones. To be safe, the replacement antenna should be selected and its installation supervised by a well-qualified broadcast engineer, preferably using site-specific engineering.

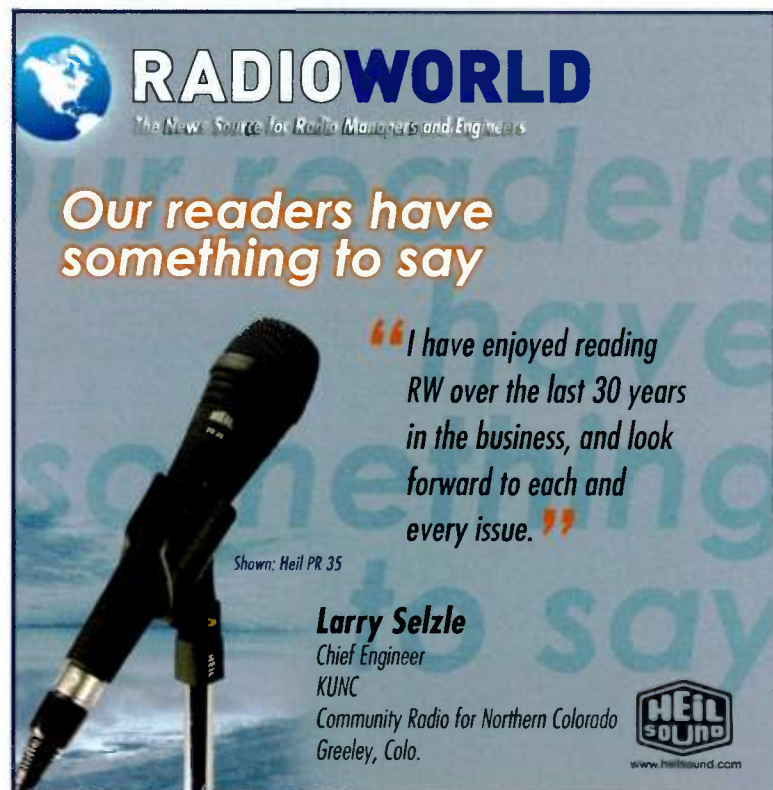
4. "If the antenna manufacturer provides measured patterns of his antenna on a tower similar to mine, I am assured of good results." Many manufacturers provide "generic pattern data" taken from measurements using a single bay on typical tower faces. Only the azimuth pattern is provided, and the elevation pattern of a multi-bay antenna on your tower is not considered or tested. At your station, most of the signal may go down toward the ground or up to the sky rather than reaching your market area or your audience.

5. "The coverage area of any FM station depends only on the ERP (power) and HAAT (height) of its antenna, per the FCC license." This is true only if all of the authorized power reaches the intended market area. Experience shows that only a small portion of the actual radiated power can reach the audience using "conventional" antenna designs and construction. Often, due to multiple lobes and nulls, part of this energy takes a different route to the audience, causing multipath interference to the primary signal.

6. "Best coverage for an FM station can be achieved by locating the antenna at an existing multiple site or antenna farm." Such common sites and "antenna farms" typically are located at a place that allows good coverage of the entire market area, although there may be reasons more political than technical for determining the specific location. The primary disadvantage of a common site is the close proximity of other antennas that may affect the pattern and coverage of your antenna.

It is important to use site-specific engineering for your station, including a detailed computer model of the site and all nearby towers and antennas. With this accomplished, all of the stations can enjoy good coverage.

Contact the author at rfdynamics@sbcglobal.net. Comment on this or any article to radioworld@nbmedia.com.



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We're Not Exploiting, We're Exposing

We're Legitimizing Artists' Work by Saying 'We Think This Is Worth a Listen or Two'

COMMENTARY

BY JOE PATTI

I really love the story the record labels have long been telling about terrestrial radio as they continue the attempt at a money grab by having broadcasters pay performance royalties on music they play: "Radio is selling commercial advertising, drawing customers and economically exploiting the work of someone else for their programming."

Huh? We're not exploiting. We're exposing. We're lending credence to the artist's best efforts at entertainment. We're legitimizing the work of the artist, saying in effect, "We think this is worth a listen or two."

If the listener likes what they hear, they can buy the work. It's promotion for the artists and their labels.

Listen, everyone in radio (as I'll refer to terrestrial radio from this point on) knows that music radio is all about exposure.

There are two groups that benefit from the exposure radio provides. One is the advertisers who pay for the chance to have their messages heard by the audience. The other is the artists and their labels who were never required to pay for the exposure they were given.

Payola? The illegal income some parties made has been only a minuscule fraction of the standard cost of the airtime given away to the music industry.

I have a book sitting on my desk that

I use frequently, sieve-brain that I am, "The Billboard Book of Top 40 Hits" by Joel Whitburn. It's edition number eight of the tome, which follows the top 40 from 1955 through 2003.

Now let's say that the digital music revolution started in 1998. That's when listeners started finding new avenues to explore and be exposed to music through new technologies.

That means for 43 years — *forty-three years* — every hit in that book was made through radio exposure and subsequent acceptance and purchase by the audience.

That's an awful lot of free airtime and missed station revenue. And it's an awful lot of profit to the record companies from record sales spurred by broadcast exposure.

And that's only one format! With the

possible exception of Elvis Presley and the Beatles, none of those records would have been hits without radio airplay.

This airplay was, by the way, encouraged by record promoters working for the record companies, sometimes accompanied by "promotional material" for use in station contests, etc.

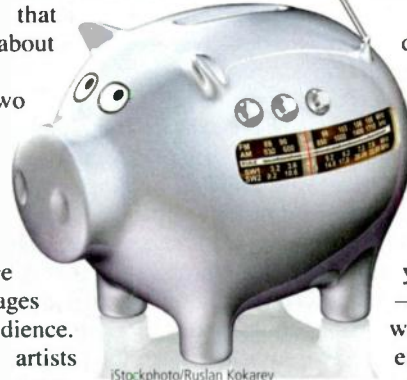
Forty-three years and billions of dollars given to promoters by the record companies to push radio airplay of music.

The world would be much different if, when live program-based radio died and we started playing records, we would have not played those records without charging the companies for the airtime as though they were any other advertiser.

The argument that satellite and Internet stations are paying, so we should as well, is a bunch of baloney. Why? Because *radio made those songs hits*. Which in turn, made the labels and their executives rich.

The satellite and Internet guys weren't around then. They are the ones who are now "exploiting" the music to make money. They had nothing to do with making those songs hits and filling the label coffers with profits like terrestrial

(continued on page 34)



Stockphoto/Ruslan Kokarev

Let's Keep the Hits Coming

A Collaborative Approach Is Best. How About 'HD Fast-Track Radio'?

COMMENTARY

BY GORDON HASTINGS

It is indeed refreshing to see that the NAB has taken a second look at their approach to resolving the issue of music performance royalties. Good for Gordon Smith and Bruce Reese, and kudos to Jeff Smulyan for publically coming forward in favor of a compromise.

The conversation must be about much more than money. A creative collaborative approach may well generate a badly needed radio and music industry renaissance.

PARTNERS, NOT ADVERSARIES

Over many decades, radio has been the key partner of both artists and labels, creating success, profits and stardom. However, we cannot forget that it is artists who sing the songs that attract audiences to the airwaves.

It is in radio's best interests to continue to encourage a partnership with a creative wellspring that is a defining element of the industry. A permanent resolution of this issue without damaging a fabulous and longstanding relationship can be a big victory for everyone. I for one want every recording star exactly where they need to be, in the radio family!

How might radio prosper from a negotiated partnership with the recording artists and labels?

First and foremost the considerable risk inherent

in an all-or-nothing approach would be eliminated. A negotiated settlement would preempt a third party (government) from writing or having an extraordinary influence over the deal. Even if radio were to win the first round, a negotiated permanent settlement eliminates the issue from reoccurring year after year, which would increase the ultimate probability of an industry loss.

A negotiated partnership could benefit radio enormously. Place on the table a window of broadcast radio exclusivity for new releases. Hard to police, yes! Impossible, no. The motion picture industry does this with every new release for the hardtop theaters. Is some film pirated? You bet, but the lines are still long for the blockbuster hits.

What about new music? HD and broadcast internet radio may be the perfect platform to expose and experiment with new artists. Spectrum is extremely valuable to artists and record companies, particularly in a tight-playlist environment. Make easy rapid access to that platform part of a negotiation. I could think of no better incubator for new music and new artists than HD Radio, particularly for artists and music genres that currently have little chance of getting on the air.

HD FAST-TRACK RADIO

HD Radio is in need of a programming rationale. HD Fast-Track Radio, as a vehicle for getting new artists on the air, may be an answer.

Crowdsourcing for new artists, driven by radio promotion on FM, on HD and on station websites, will discover new superstars. "American Idol" is an excellent example of crowdsourcing that can also work for radio.

HD Fast-Track Radio could provide a nationwide new music network or networks by format with new

artists uploading content from all over the world, distilling and judging the product and putting only the best on the air. The industry could offer the carrot of a top weekly, monthly, annual new music prize. Yes, there could even be a weekly radio "American Idol." Place only the bright young minds that currently work in radio in charge of this concept and they will figure how to make it work.

What about paying the performance royalty bill?

Radio delivers extraordinarily valuable targeted audiences, and no one knows that better than the music industry. Can a pool of on air, HD and radio website inventory be made available to become all or part of a royalty package? A negotiated partnership as opposed to a legislated settlement is likely in the end to be a superior financial arrangement for radio.

The radio and music industry simultaneously are undergoing extremely challenging times. That in itself may be a sound bargaining foundation for a permanent, mutually acceptable and innovative profitable agreement.

Win-or-lose situations, particularly between constituencies that have historically been natural partners, are not a good thing. There is also no guarantee that members of Congress who have signed on to support the Radio Freedom Act will not change their minds when it comes time for an actual debate and vote. Some reasonable and important voices in Washington have sent a message that both sides should "sit down and work out a solution." Poignant advice?

Music and radio are synonymous. Together they can creatively continue to be a formidably successful combination. It may be the best and only way to launch another radio renaissance. The answer is not in the nickels and dimes, it is in the big picture.

The author is president of ghhManagement, former president of Katz Radio and Katz Television and founder of the Broadcasters Foundation of America.

EMERGING BONDED META-DATA APPLICATIONS

The phrase "bonded meta-data" caught our eye in the title of a recent presentation by Mike Starling, who is NPR VP and chief technology officer as well as executive director of NPR Labs. We asked him to tell us what that means and why it's important.

"NPR's Public Radio Satellite System is currently upgrading the infrastructure introduced as ContentDepot in 2005 to accommodate emerging meta-data applications," Starling replied in an e-mail.

"Several broadcast organizations are working to advance these emerging services in the months ahead."

Starling explained that bonded meta-data is content associated with and carried in digital transmissions, making it easier to identify information for sorting, searching, acting as triggers for events and other uses.

"Because the data is 'bonded' — or attached — to primary content, it remains available over time during the reuse, such as recording or play-out, of the primary content."

Examples of bonded meta-data have existed in a basic form since digital audio and digital television launched, he explained.

"Program-Associated Data (PAD), Program Service Data, music tagging and conditional access encryption are more commonly recognized examples. More recent examples are radio captioning and location-based services, such as traffic events.

"In the case of traffic, meta-data can also work as triggers for activating graphics for traffic maps, identifying commercial and non-commercial points of interest, or highlighting community events."

These developments are worth paying continued attention to. They are relevant for the radio broadcasting community because they offer opportunities to develop new broadcasting services and increase broadcasting's relevance for consumers.

As Starling puts it: "Radio broadcasters are developing new uses for digital transmission; that is, they're developing new services that can be carried through radio transmission. These new services, in turn, can provide new services to consumers in both the business-to-business and business-to-consumer markets."

— *Radio World*

READER'S FORUM**START THE CLOCK!**

In the online story "Most Broadcasters, Manufacturers Support Extending EAS-CAP Deadline," RW reported:

"The National Association of Broadcasters said the 'overwhelming majority' of those who filed agree with the need for extension for several reasons: 'FEMA may not announce the final details of the CAP standards until close to its publication of those standards in September 2010. Vendors will need sufficient time to incorporate those details into their software products before design of the products can be finalized.'"

But also: "Sage Alerting Systems ... maintains that its equipment now on the market can handle the CAP protocol and says there's no need to delay the deadline."

Delaying the clock start on CAP-compliant EAS equipment and deployment could cost lives.

NAB has only the interest of its patrons on its political agenda. It is a lobby for the broadcast industry. The NAB's goals are not necessarily in the general public's interest, convenience, necessity and safety. Stalling tactics are not on the side of the rest of us.

The problems of ramp-up on EAS CAP-compliant instrumentation will be no different from what they were several years ago. I speak from the experience of having worked with Sage to supply more of the original EAS units to stations and cable systems than all of the other suppliers, combined.

Supply chain problems today are no different than they will be six to 12 months from now. Manufacturers will scramble to make deadlines work. There will be hiccups. Nobody is sitting (or will sit) on thousands of units to fill a sometimes arbitrary deadline. It's not good business. They won't be sitting on them in six to 12 months, either.

The vagaries of the orders, deliveries and backorders will not be unique. We'll all make it. It's time to look out for the life, limb and property of the general public.

The most advanced emergency warnings delayed are the most advanced warnings denied. Public safety should never be wagged by the tail of cash flow but by an obligation broadcasters and others have to protect and serve. Let's get on with the safety of our listeners, viewers and advertisers. They're the way we make a living. Start the clock!

For that same reason, make sure your staff and your local emergency management people become good friends now, with full contact information, to be ready when that emergency happens in your served area. I'd not want to be a broadcaster having to face my listeners and my advertisers in the aftermath of an unreported, deadly emergency.

Dave Burns
Richmond, Ind.

ROYALTY

(continued from page 33)

broadcasters had.

Should the artists be compensated for their work? Of course they should; that's not the question.

The question is, "Who really should be paying the artists?" Quite simply, the record companies.

These are multi-national, multi-billion dollar corporations, and the usual payout to the artists when a record is sold is maybe 10 percent of the retail cost per copy. That gets split between all the "artists" on a recording: singer, musicians, etc. No wonder artists are screaming to be paid. Guess where the majority of an artist's income comes from? Concerts and live performance, and a cut of the artist-based concessions: T-shirts, CDs, etc.

And if the current push toward royalty negotiations is the best we can do, we should all lie down in the middle of the street to make it easier for the recording industry to run us over. My version of the negotiations? You charge me royalties on the music we play, I'll make up for that by sending you a bill for the airtime used.

Bottom line: It's not radio's fault artists are not getting paid, and the onus to pay them should not be laid at the doorstep of terrestrial radio.

Currently a public radio production manager and commercial radio weekend jock, the author is a 30-year broadcast veteran, spending most of that time producing, performing and programming at commercial stations. Opinions are not necessarily those of his employers.

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E-mail: radioworld@nbmedia.com
Web site: www.radioworld.com
Telephone: (703) 852-4600
Business Fax: (703) 852-4582
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SUBSCRIPTIONS

Radio World, P.O. Box 282, Lowell, MA 01853
TELEPHONE: 888-266-5828 (USA only 8:30 a.m.–5 p.m. EST)
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SOUTHERN EUROPE, AFRICA, MIDDLE EAST:
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Graham Kirk, g.kirk@audiomedia.com
T: +44-1480-461555 | F: +44-1480-461550
JAPAN: Eiji Yoshikawa, callems@world.odn.ne.jp
T: +81-3-3327-5759 | F: +81-3-3322-7933
ASIA-PACIFIC: Wengong Wang, wwg@imaschina.com
T: +86-755-83862930/40/50 | F: +86-755-83862920
CLASSIFIEDS: David Carson, dcarson@nbmedia.com
T: 212-378-0400, ext. 511 | F: 866-572-6156

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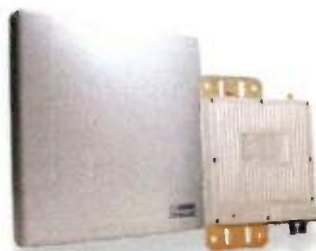
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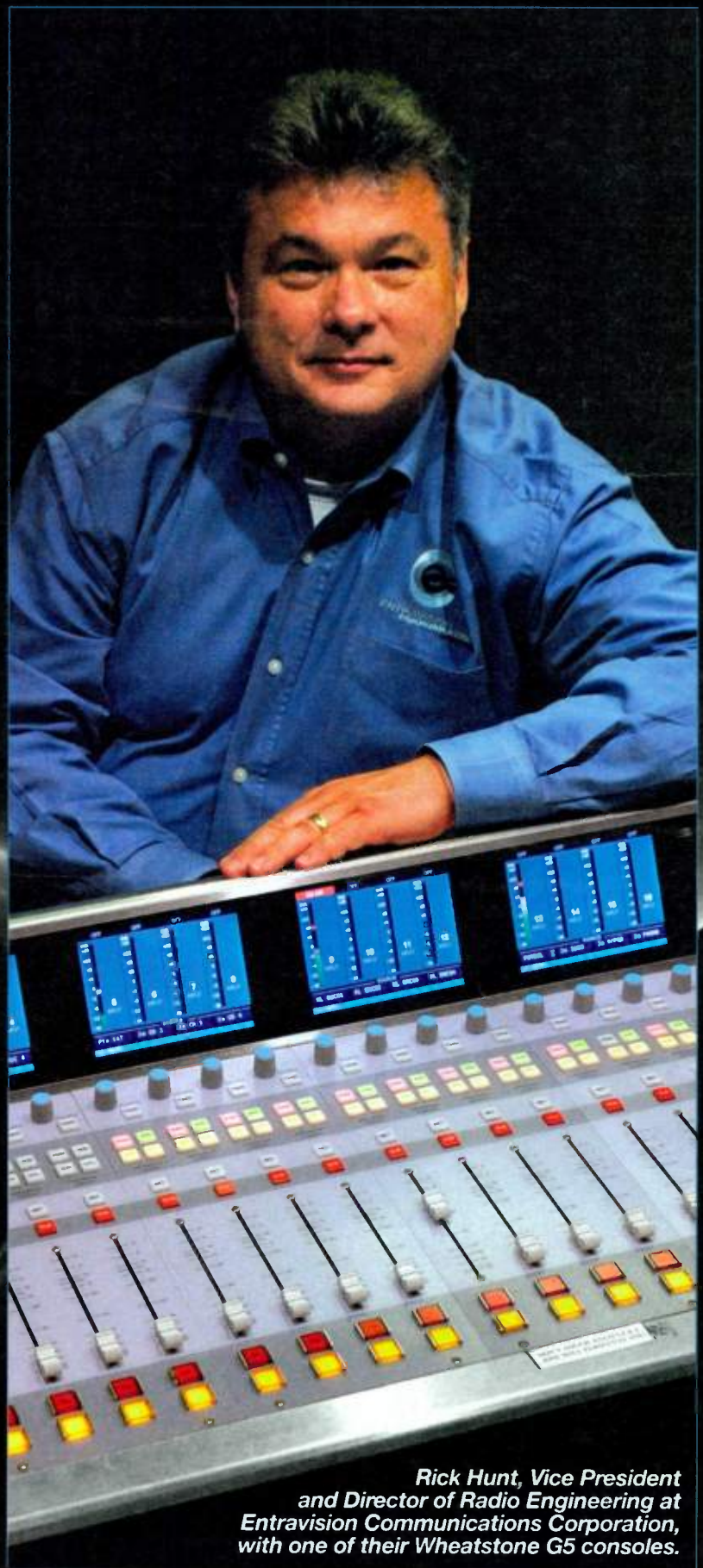
Entravision currently has Wheatstone TDM systems in 5 of their markets – including Los Angeles where 27 surfaces provide programming for their eight Los Angeles area transmitter sites and seven satellite uplink networks.

Rick Hunt, Vice President and Director of Radio Engineering at Entravision Communications Corporation knows that taking chances with unproven or ad-hoc technology simply isn't feasible – that the ultimate cost of using less than the best can be detrimental not only to day-to-day operations but to their overall success.

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*Rick Hunt, Vice President
and Director of Radio Engineering at
Entravision Communications Corporation,
with one of their Wheatstone G5 consoles.*

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