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**Final Chapter**

The demise of the towers at Playa de Pals plays out and Radio Liberty buffs watch in an online video.

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**AM's 'Insane' Success**

General Sales Manager Robby Robinson says AM can indeed compete in an HD Radio world.

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# Radio World

\$2.50

The Newspaper for Radio Managers and Engineers

August 2, 2006

**INSIDE**

**STUDIO SESSIONS**

▼ We try out the Wheatstone Vorsis AP3 Digital Signal Processor, Adobe Audition 2.0 and DaySequerra's M4 HD Radio Tuner.



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▼ Engineer/Owner Larry Langford evaluates digital radio at 'street level' in Chicago.

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▼ Cris Alexander looks at AM antenna mods for IBOC.

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**ENGINEERING**

▼ Surprising perceptions about engineers — and how you can change them.

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▼ There's a fine line between streaming and downloads. New devices are erasing it.



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**OPINION**

▼ Comments from Ted Schober, "Bear" Bradley, Charles Pitts, Tom Taggart, Mike Vanhooser, Darren J. Morton, Tom Ray, Lawrence Magne, Roger Stubbe and Randy Aldous.



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**Heil Takes the Hall**

Musician, inventor, supplier, ham — Bob Heil's career is commemorated at the Rock and Roll Hall of Fame and Museum.

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## Part 15 FM Devices Draw NAB Scrutiny

*Many Tested Exceed Limits, Says Trade Group*

by Leslie Stimson

NAB gave the commission a big visual aid to put into context how much power wireless and wired FM modulated products are pumping out — so much that broadcasters increasingly are fielding listener complaints about interference from iPods, MP3 players and satellite radio plug-ins.

In tests of wired and wireless FM

modulated products, NAB said, the majority tested exceeded the FCC's emission and bandwidth limits. It also found apparent violations of the commission's antenna rules.

The test results come as NAB is lobbying Congress and the FCC on two overlapping issues. It wants regulators to declare that the satellite radio companies are national-only services and to

See FM MODS, page 5 ▶

## Technicians, NPR Ratify New Deal

*NABET Members Lose Recording and Mixing Exclusivity in New Contract*

by Randy J. Stine

WASHINGTON Broadcast recording technicians at National Public Radio will make more money and enjoy increased job security, yet lose much of their exclusive authority to record and mix audio for air.

The new contract, which gained an approval vote of 61 percent in May, provides pay increases totaling 13 percent over three years along with a 1 percent signing bonus and the addition of five new union positions.

However, sources say that some technicians worry those gains could be offset by having less exclusive work to do in the future. In fact, audio engineers are no longer the final authorities on audio quality control, according to wording in the contract.

The contract takes a step further a 2002 NABET agreement that had technicians and reporters/producers sharing some technical duties, sources said. Unionized technicians were first given the exclusive right to mix

See UNION, page 8 ▶

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# Bush Pushes EAS Update

by Leslie Stimson

**WASHINGTON** Broadcast observers hope recent action by President Bush means a pending FCC rulemaking on the Emergency Alert System will see movement soon.

Bush wants public warning systems — including the Emergency Alert System — updated, and Congress has set aside \$25 million over three years for a pilot project.

In an executive order, the White House ordered Homeland Security Secretary Michael Chertoff, along with the Defense Department, the Commerce Department and the FCC, to update public alert

mechanisms, including EAS, and integrate public warnings with other devices, such as cell phones, pagers and PDAs.

The money will be used for pilot studies, such as sending alerts as text messages to pagers, according to DHS.

### Common alerting protocol

Such a system is in use in Mississippi. Supplier Global Security Systems at NAB2006 displayed chipsets that could be integrated into smoke alarms, or iPods and MP3 players so that EAS alerts could be sent over those devices.

The push closely tracks suggestions made by EAS proponents over the past

few years.

Clay Freinwald, chairman of the SBE National EAS Committee, stated, "Many of the points that President Bush raises in the Executive Order are specifically addressed in the SBE filing or are an established part of the SBE's EAS goals, including the use of a common alerting protocol."

Indeed, the SBE, in comments to the FCC as part of the pending EAS proceeding, supported infrastructure to bring about state and regional coordination improvements by embedding alerts in the digital stream, thereby opening the door for warnings to not interrupt programming, according to one EAS observer.

"The SBE believes that broadcasters are an important part of a public warning system, and we have worked to improve

the system and the tools that are available," Freinwald continued.

NAB spokesman Dennis Wharton told Radio World, "We support strengthening the EAS system, to the extent that it's flexible, reasonable and works within the constraints of the existing system."

Richard Rudman, president of consulting firm Remote Possibilities, speaking on his own behalf, said, "The first and most important thing to spend the money on should be a nationwide needs assess-

**The president moved responsibility for EAS from Commerce to Homeland Security. FEMA would manage the integrated warning system.**

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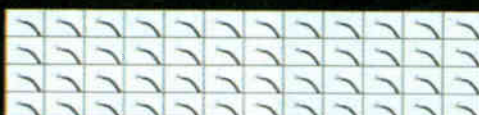
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ment of the EAS infrastructure to see what works, what is broken and what has never been built."

Some engineers have argued publicly on listservs and elsewhere that that the government should fund EAS at the local level as there is little use for it as a distribution method for presidential messages.

Under current rules, participation of broadcasters in state and local alerts is voluntary.

One broadcast opined on a public radio listserv that the daisy-chain system for transmitting and receiving alerts should be replaced with a method in which all alerts go out at once.

The need for an EAS overhaul was  
See EAS, page 3 ▶

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NEWS ANALYSIS

# Could Audio Flag Jeopardize HD-R?

*While a Senate Panel Clears the Concept, the Fate of a Telecom Rewrite Remains Uncertain*

by Leslie Stimson

So-called "audio flag" language is part of a rewrite of the Telecom Act passed by the Senate Commerce Committee in June. It's an important hurdle for a concept that broadcasters say could impede HD Radio and end up costing them a lot of money.

But final passage of the overall Telecom Act was far from certain as the calendar turned into July.

The issue pits record labels and songwriters against satellite and terrestrial radio broadcast organizations as well as receiver makers.

Supporters want Congress to legislate a flag in order to stem music sale losses from downloads. Opponents say the legislation impinges on consumer rights and would stymie satellite radio sales and stop the HD Radio rollout. Terrestrial and satellite radio organizations prefer to work out the issue without a congressional mandate.

The language as passed by the committee would not ban new handheld, portable satellite radio devices that have recording, storage and playback capabilities. However it would set the stage for future regulation of the ability of these devices — and for HD Radios — to make private copies of digital content.

No floor vote for S. 2686 had been scheduled at press time. Sen. Ron Wyden, D-Ore., put a "hold" on the bill to keep it from reaching the floor for reasons unrelated to the radio provisions. A hold can lead to a filibuster.

Also, committee Chairman Sen. Ted Stevens, R-Alaska, said on the eve of the committee vote he did not yet have the 60 votes needed for Senate passage. Indeed, after the vote, the ranking Democrat on the committee, Alaska's Sen. Daniel Inouye, released a multi-page set of preferred revisions.

Even if the Telecom Act rewrite passes the Senate, it's unclear whether it could be reconciled with the narrower House version. Frequently, bills that emerge from House-Senate conference committees are stripped of several of their controversial elements; this happened with the first Telecom Act 10 years ago.

The audio flag also faces problems in

the House. A stand-alone bill has been introduced, but the language is not part of the telecom measure approved by that chamber.

Aside from the process hurdles facing passage of a flag this year, insiders also point to a shortened legislative calendar as November elections approach.

## Review board

The broadcast flag system, if passed, would consist of two parts: the "flag" itself — a technology to mark the content as copy-protected — and rules to define how the devices handle flagged content, perhaps including restrictions on operations like multiple copying or playback.

The committee approved language that would authorize the FCC to establish a "review board." This would be made up of representatives of various entities with a stake in the outcome; the board would be charged with developing audio flag technology regulations within a year, plus a possible six-month extension.

If the group failed to turn in a flag proposal, the FCC could — but wouldn't be obliged to — initiate a proceeding to determine what, if any, digital audio copyright protections are necessary, according to the amendment. NAB confirmed this interpretation of the language.

## What They're Saying

"Congress should not enact legislation until the recording industries clearly state what is the threat. We are far from that point." — Ruth Ziegler, Sirius

"We have no problem with audio recording, but when the experience mimics the Rhapsody experience, that's wrong." — Mitch Bainwol, RIAA

"This HD Radio rollout is entering a delicate stage. Success will depend on whether a critical mass will follow these early adopters." — Andrew Levin, Clear Channel Radio

"The RIAA wants everyone to halt their business while this is worked out." — Gary Shapiro, CEA

from the Department of Commerce to the Department of Homeland Security. The Federal Emergency Management Agency would manage the integrated warning system with help from the Department of Commerce through its National Oceanic and Atmospheric Administration, the FCC and the Department of Defense.

Observers believe the FCC's level of responsibility for EAS would remain unchanged.

"We'll continue the evaluation of the EAS system and look forward to working with the Department of Homeland Security to improve it," said an FCC spokesman.

The DHS has an office within the FCC's Enforcement Bureau that makes sure that stations install and maintain EAS encoders/decoders and conduct periodic tests.

Audio flag is one of two radio-related provisions in the Senate bill; the other is an amendment concerning LPFM (see sidebar, page 8.)

## Radio restrictions

The same week during which the Senate committee voted on the audio flag, House lawmakers debated it.

Clear Channel Radio Executive Vice President/Chief Legal Officer Andy Levin and Consumer Electronics Association President/CEO Gary Shapiro told lawmakers that audio broadcast flag legislation would strangle the fledgling HD Radio rollout by introducing uncertainty into the market.

Such legislation could also end up costing consumers two to three times what they pay now for satellite radio recording devices, Shapiro said in his testimony before a subcommittee of the House Commerce Committee.

Members discussed a bill by Rep. Mike Ferguson, R-N.J., that authorizes the FCC to "impose licensing conditions on digital audio radio to protect against the unauthorized distribution of transmitted content," according to the document.

Recording Industry Association of America President/CEO Mitch Bainwol and Stewart Harris of the Songwriters

Guild of America said illegal and legal digital downloads are siphoning profits from the record labels and shrinking the livelihoods of artists. They said Congress needs to step in and make terrestrial and satellite radio organizations and receiver manufacturers agree to a technological solution to prevent consumers from re-distributing content.

## Encrypted

New devices such as the Pioneer Inno XM2go, Samsung XM Helix and Sirius S50 basically turn radio into downloading services, according to Bainwol. No such portables allow consumers to record and store material HD Radio content, but such products are expected; the RIAA wants an audio flag to apply to those also.

XM and Sirius say the controversial products are designed so stored content stays on the device and cannot be re-distributed.

Sirius Satellite Radio Deputy General Counsel Ruth Ziegler said, "Contrary to reports, the S50 does not provide for automated services. S50 songs are encrypted and cannot be taken off the device."

Under the 1992 Audio Home Recording Act, Sirius is paying "millions" in dollars in royalties for digital audio recording devices to the record labels, royalties that are shared with musicians and others in the music industry, she said.

See FLAG, page 6 ▶

# EAS

▶ Continued from page 2

highlighted by an incident in late June when a closed circuit test of equipment being installed at the LP-1 EAS station in Santa Barbara, Calif. was instead broadcast as a Civil Emergency Message with no details and no header telling the public that it was only a test.

According to the CGC Communicator newsletter, almost all participating radio, television and cable companies in Santa Barbara and Ventura counties carried the mistaken EAS message, and the public swamped 911 lines with inquiries for nearly 30 minutes.

In his Executive Order, the president moves overall responsibility for EAS

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FROM THE EDITOR

# For SCMS at 30, a Digital Party

by Paul McLane

The year 1976 must have been a good one for planting businesses.

That's the year IMAS Publishing was founded, which means our company is 30 this year. Radio World (for a short time called Broadcast Equipment Exchange) was launched the following year.

Also in 1976, a technical sales engineer who was selling nuclear research equipment rented a plane from someone who happened to work in the broadcast business. The connection gave him an idea.

He'd been looking for a way to move back to the Carolinas, where he'd grown up, to be closer to family and the beach. Bob Cauthen decided broadcast equipment would be fun to sell and thought Charlotte, N.C., would be a good spot for an office because it would be central to the southeast.

"At that time, before consolidation, most reps and dealers were very regional," Cauthen recalls. "After saving what I thought was enough money to make the plunge, I got married, moved my wife and myself to North Carolina and started a business all within 30 days."



Photos by Jim Peck

Roger Crawford, assistant to the general manager of WNCW(FM) at Isothermal Community College in Spindale, N.C., wins a Vorsi AP-3 Digital Signal Processor. He's center, with Mike Phelps of SCMS and Jay Tyler of Wheatstone.



Ted Bryant, former chief engineer of WBT(AM) in Charlotte, registers.



Panels on the implications of multicasting drew interest.

Cauthen had been an electrical engineering major at Clemson University in South Carolina and had had some exposure to radio with the student station there and, later, with the Signal Corps of the U.S. Army. Now he had to scratch out

a niche in radio.

"The hard part was talking manufacturers into giving me a chance. My first sale was an LPB Signature console to a small FM station in Dunn, N.C. After that, we grew one day and one sale at a time."

Over the years, SCMS developed relationships with top manufacturers and now sells products for broadcasters, recording engineers and commercial sound. It developed expertise in both RF and audio, and it formed a computer division, Computerworks, early in the IT game.

The dealer now has seven field offices in addition to a 12,000-square-foot headquarters and warehouse in Pineville, N.C. The company employs about 20 full-time staff.

Kudos are in order to SCMS not only for its 30th — the "pearl"

try experts in person and put their hands on equipment and keyboards without flying to a distant city.

## Dual-track

The event drew about 50 exhibitors and 250 attendees.

The company's Jim Peck said, "Our folks worked very hard to pull this off, and we did. The combination of dual-track presentations and panels, nice location (with shopping nearby for significant others who 'just came along for the ride'), and dedicated breakout for vendors and networking seemed to hit a sweet spot."

Cauthen thought the highlight of the



Mary Schnelle, Kimberly Rithianos and Marilyn Malcolm of SCMS.

conference was the luncheon and keynote speaker Scott Stull from Ibiqity. "In addition to receiver and technology information, he shared some 10-year projections of domestic IBOC conversions. The numbers are staggering and radio growth over the next decade is going to be phenomenal."

Topics of interest included HD Radio transmission and secondary channels as well as the impact on PDs and GMs of multicasting.

Cauthen said SCMS may hold the event again next year depending on the rollout status of HD. "We felt the timing was perfect this year considering the secondary channel implementation. We may also decide to do the next one on the West Coast, in the L.A. area; or do two."

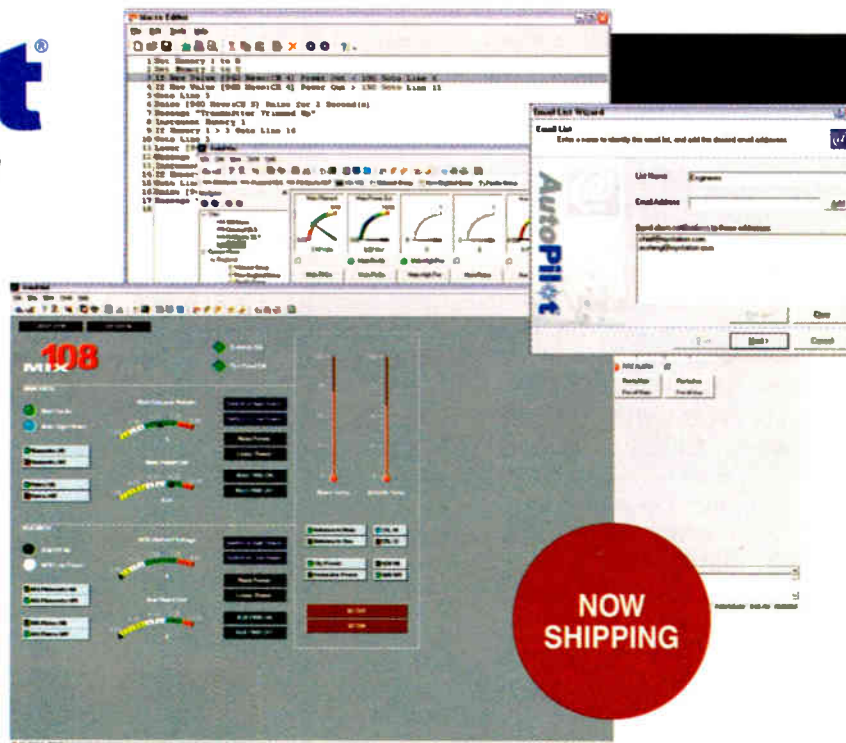
Congrats to SCMS for its success as an industry "pearl" and for this well-attended event.

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# FM Mods

► Continued from page 1

prevent stations whose signals are "hijacked" by wireless FM modulators for satellite from being fined for indecency.

Not all such modulators are used for satellite services, though stations are receiving the most complaints about them, NAB says.

The trade group also told Congress it believes its tests are relevant to the current discussion on "white spaces" — room for unlicensed device operation in the television spectrum — as an example of how "uncertainties with unlicensed device operation can have negative effects on consumers." Meanwhile, sources close to the issue say it's difficult for the FCC to police how the public uses the devices.

## Comparing wireless, wired

Meintel, Sgrignoli & Wallace is an engineering consulting firm NAB has used in the past. The Waldorf, Md.-based company tested a variety of products chosen as representative of types of products available, rather than for their market penetration, said David Layer, director of advanced engineering for NAB Engineering & Technology.

MSW tested 17 wireless FM modulated devices covered by the commission's Part 15 rules and four wired devices not subject to those rules, all used to transmit audio from satellite radios and MP3 devices to car radios.

Various manufacturers, features and price points were represented, from No. 1, the SF-150a by Akron at \$12 to No. 15, the Sirius S50, at \$280.

The "wireless" devices tested were the Akron SF-150a and 250, Belkin Tune Cast F8V367-APL and Tune Cast II F8V3080, C. Crane FMT, Dynex DXAC101 and DX-MP3FM, Griffin Technology iTrip 9500 TRIPDA, Hobbytron FM25B, iRiver AFT-100, iRock 450FM, Lenmar AI-MODAM, Monster iCar Play AI-IP FM CH, RCA MM70FM, Sirius S50 and Sportster SP-TK2, and Starvision FT-07.

"Wired" devices were the Delphi SA10003, Pyle PLMD2, Scosche FM-MOD01 and Starvision FM-07.

NAB did not return messages regarding what it hopes the FCC will do with its findings. In the report, it states: "It is important that regulatory agencies apply the Part 15 rules in an equitable manner to protect primary spectrum licensees, consumers and other Part 15 device manufacturers that strive to manufacturer devices that that are Part 15 rule compliant."

Part 15 enforcement "should be a priority," states NAB, and "the interference caused by the devices hurts the goal of efficient spectrum management."

The FCC has said spectrum management and the policing of harmful interference are priorities.

The NAB says it also believes many of the modulators in the marketplace could interfere with new digital radios.

One source with knowledge of the issue said even though IBOC radios will resist interference better than analog, the

## "Wireless" Devices Measurement Results

Device	Frequency 1	Field Strength w/ K Factor dBuV/m	Frequency 2	Field Strength w/ K Factor dBuV/m	Frequency 3	Field Strength w/ K Factor In dBuV/m
1	88.3	54.0	93.5	56.8	95.1	56.4
2	88.3	57.9	88.7	59.5	107.7	67.3
3	88.3	55.5	88.5	55.2	88.7	54.2
4	88.3	54.4	98.5	53.4	107.7	50.5
5	88.3	41.1	98.5	41.7	107.7	49.4
6	88.1	54.2	88.3	54.0	88.5	52.9
7	88.3	69.4	98.5	63.4	107.7	59.3
8	88.3	48.1	98.5	41.3	107.7	35.7
9	88.3	86.9	98.5	99.9	107.7	88.5
10	88.3	72.0	98.5	72.5	107.7	79.6
11	88.3	65.6	98.5	66.5	107.7	73.4
12	88.3	77.1	100.5	79.8	106.5	82.2
13	88.3	48.2	88.7	48.1	89.1	48.2
14	88.1	57.4	88.3	57.1	88.5	56.3
15	88.1	73.0	98.5	74.9	107.7	76.3
16	88.3	76.0	98.5	72.0	107.7	76.3
17	87.9	76.1	88.3	77.0	88.7	77.2

Devices highlighted in Yellow are above limits, compliant devices highlighted in Green.

## "Wired" Devices Measurement Results

Device	Frequency 1	Field Strength w/ K Factor dBuV/m	Frequency 2	Field Strength w/ K Factor dBuV/m	Frequency 3	Field Strength w/ K Factor In dBuV/m
18	87.9	49.1	88.1	45.4	88.5	43.3
19	88.5	48.3	88.9	42.7	NA	NA
20	87.9	48.0	88.3	48.0	NA	NA
21	87.9	48.8	88.3	48.2	88.7	47.8

Source: NAB

devices are just "hammering" the signal, some at 50 dB — 100,000 times the allowable emission limit.

NAB said the modulation capabilities of the devices allow them to occupy more than one FM channel simultaneously and the strong field strengths emitted by some of these devices will exceed the co-channel and adjacent-channel interference ratios (D/U ratios) at which consumer radios operate. Therefore, "use of these devices can wipe out reception of both analog signals and the new digital signals."

"This is problematic for consumers' use of radio in any event, but it is particularly troublesome with regard to current deployment of new digital signals that consumers are just beginning to experience," states NAB in the report.

## 2,000% or more

The wired devices tested are not covered by Part 15; they use a wired connection to the radio antenna. However, NAB sought to demonstrate in the charts that the emission of a wired device can be higher than that of an unwired Part 15 device, and turned into an unlicensed radiator, depending on how it is built or installed by consumers.

Specifically, the test results showed:

- 13 of the 17 wireless devices were found to exceed the 48 dBuV/m limits of Part 15 operation. One device, item No. 9 on the list, the Hobbytron FM25B, had the highest field strength at 99.9 dBuV/m. Six devices were found to exceed the FCC field strength limit by more than 2,000 percent.

- Many devices transmitted signals that were substantially wider in bandwidth than the 200 kHz-wide FM channel, resulting in potential interference not only to the signal in the channel to which the Part 15 device is tuned but to first- and second- adjacent channel signals as well.

- Some of the devices did not meet the antenna, FCC ID label or compliance labeling requirements of Part 15.

The FCC ID label is important, Layer said, to determine whether a device is FCC-certified.

tor required by the FCC to make it more difficult for consumers to use an antenna that is different, and more powerful, than that supplied with the device.

S50 manufacturer Directed Electronics subsequently told the Securities and Exchange Commission that it had been told by the FCC its S50C and ST2 are out of compliance with emission or operating frequency limits. DE said it would cooperate with the commission and work with its subcontractors to make modifications.

MSW also tested a Delphi XM Rody, listed as No. 18 on the chart.

Neither XM nor Sirius responded to messages for comment about the results for their devices in the study.

A spokesman for the Consumer Electronics Association said, "The FCC has worked with manufacturers where enforcement has been needed, and manufacturers have responded."

The tests were conducted from May 14 to June 2.

Some of the wireless devices were within allowable limits. These were numbers 5, 6, 8 and 13.

MSW found the other wireless devices to be above the allowable emission limits. The average of all the measurements was 62 dBuV/m exceeding the Part 15 limit by 14 dB, or five times the limit, according to MSW.

Sources said NAB's intent was to study the effect of a legal modulator connected incorrectly and the results show that even with incorrect installation, wired modulators are closer to compliance than wireless devices.

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# Flag

► Continued from page 3

The audio flag bill would prevent "the very first copy a consumer makes in his own home," blocking a long-accepted practice, Ziegler said. "Congress should not enact legislation until the recording industries clearly state what is the threat. We are far from that point."

RIAA's Bainwol said, "We have no problem with audio recording, but when the experience mimics the Rhapsody experience, that's wrong." Rhapsody is a digital music download service.

He practically scoffed at the \$2 million a year labels receive annually under the Audio Home Recording Act for digital

audio devices, saying the RIAA believes 2 million illegal downloads are performed each day.

Ziegler countered that Sirius pays the labels twice: for music royalties for broadcast, and for the \$50 under the Home Recording Act. She also said the agreement between Sirius and RIAA is private and valued in the millions, not just \$2 million.

The RIAA says these devices allow users to "cherry-pick" songs out of the order in which they originally aired, working like a download service, and therefore it argues labels should receive more than they do now from device manufacturers. The RIAA has sued XM over the Inno, as reported here, seeking \$150,000 in damages for every song copied by XM subscribers. XM and CEA

are fighting the suit.

Shapiro and Ziegler noted that the RIAA chose to say the compensation agreed to previously under the AHRA wasn't enough now that the devices have come to market.

"We did cut a deal and it's kicking in now, said Shapiro. "It's only \$2 million because they haven't been sold yet; \$8 to \$10 per device goes directly to the music industry. Sirius and XM give monthly (the label) a monthly fee." The satellite radio companies are "the largest payers" of fees to the music industry, Shapiro said.

While terrestrial radio pays royalties to rights-holders such as ASCAP and BMI, broadcasters do not pay the labels extra for consumer download and distribution, as services such as Apple iTunes must. The RIAA wants the extra money from

broadcasters and believes Congress should mandate that the FCC force terrestrial radio to pay it.

Levin, testifying for NAB, said it's too early for Congress to step in. Regardless, he said, lawmakers should not mandate an audio flag.

"This HD Radio rollout is entering a delicate stage. Success will depend on whether a critical mass will follow these early adopters." Approximately 800 stations are airing their primary signals in digital at a cost of about \$100,000 for each conversion and 1,200 more stations plan to convert, he said.

Industry players, including stations and others, plan to spend about \$400 million in the next two years to promote HD Radio, Levin testified. "Any uncertainty ... and technical requirements could deal a fatal blow" to that rollout and hurt stations, manufacturers, automakers, and retailers.

Lawmakers asked him whether Clear Channel or NAB is working with manufacturers on next-generation HD Radio devices, such as those on the market from XM and Sirius.

## HD-R 'delicate'

Levin said, "I talked to our chief engineer yesterday and asked that. The answer was there is no discussion about next-generation devices." All energy is being expended "on getting first-generation receivers introduced," said Levin.

"Consumers don't have to adopt HD Radio, so we're in a precarious position to get manufacturers to produce HD Radios, consumers to buy them and automakers to put them in their car." The rollout is "completely market-driven," he said.

Audio flag talks continue between NAB and RIAA, their representatives said; Levin testified those should be given a chance to work.

Rep. Barbara Cubin, R-Wyo., asked Bainwol about other sticking points besides payment. Bainwol identified usage rules for the audio flag and a ban on so-called "cherry-picking" of songs.

Levin said, "While we agree in concept to the notion of no cherry-picking, there are nuances that still need to be worked out. The recording industry's view of what that is is fairly broad; it would turn back the clock on what is lawful use to consumers. ... We need to take a hard look at what consumers are entitled to before it's memorialized in legislation."


When pressed by Rep. Eliot Engel, D-N.Y., Levin said he thought the group might reach agreement within 6 to 12 months.

Subcommittee Chair Fred Upton, R-Mich., noted that he doesn't think "Congress getting involved is the best solution (except) when there seems to be a lack of negotiation."

Cubin said if the group can't work out the issue, "We're ready to get to work to fix it."

CEA's Shapiro said, "There's no excuse for an audio flag. The problem is, in the short term, the content industry reacts to every new technology with fear. We are barraged with bills and lawsuits."

"The RIAA wants everyone to halt their business while this is worked out. We have to stop measuring creativity by the business plans of 10 to 12 companies," referring to the music labels.

Saying she was speaking for consumers, Public Knowledge President Gigi Sohn said the audio flag is unnecessary and would hamper innovation by placing the FCC as an arbiter of which products come to market. 



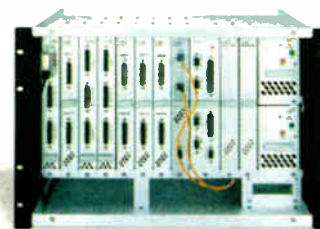
"The South has a lot of 'favorites' including barbeque, football and great hospitality. I'm adding Logitek to my list."

"Logitek was the solution for our consolidation in Birmingham. We wanted a system that was flexible and reliable. The most flexible systems are based on router technology, and after looking at the choices, I picked Logitek. Logitek lets me make changes fast and seamlessly. It manages my satellite feeds, 'talks' extensively to my Prophet system and lets me add sources and outputs without ever changing a wire connection. My operators love the ability to get any source anywhere, too."


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Bob Newberry  
Market Engineering Manager  
Clear Channel - Birmingham



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World Radio History

# Union

► Continued from page 1  
audio when jurisdictional work rules were implemented in 1989.

NPR management says modernized workplace rules were needed because the network is now using editing technology that increases efficiency.

## Sharing duties

Approximately 90 broadcast recording technicians at NPR's Massachusetts Avenue headquarters in Washington and another 15 technicians at bureaus in New York, Chicago and Los Angeles are represented by The National Association of Broadcast Employees and Technicians union, part of the Communication Workers of America.

Previously, the broadcast recording technicians had the final say on audio mixes before they were aired and did most of the technical recording jobs, including tape syncing, mixing audio, live host remotes and desktop recording — work that NABET bargainers said contributed significantly to the network's signature sound.

NPR spokeswoman Andi Sporkin said, "It will become more of a collaborative effort, but certainly [the technicians'] expertise will be sought. If necessary, the show producer will have final say over what goes on the air."

The broadcast recording technicians maintain exclusive responsibility for operating technical equipment in technical facilities, specifically Master Control and control rooms, Sporkin said.

The sometimes contentious contract talks resulted in the union running advertisements in various Washington newspapers asking members of Congress to deny interviews to any NPR reporter unaccompanied by a NABET technician (RW, April 20).

Meanwhile, NPR began assigning broadcast technicians' duties to AFTRA-covered reporters, producers and editors in January after the broadcaster declared contract talks had reached an impasse. AFTRA is the American Federation of Television and Radio Artists. An arbitrator later ruled that NPR had to cease and desist such practices.

"We are pleased that endorsement of the new NABET contract comes from the clear majority of the membership who ratified it," Sporkin said. "It unquestionably reinforces NPR's stated long-term commitment to our NABET colleagues."

The contract "guarantees additional staff positions to the unit and unprecedented job security for them," Sporkin said.

NPR cannot eliminate any NABET positions unless there are programming or economic changes that affect the jobs of other staff, including program cancellation, she added. New audio technician hires will not be afforded the same job protections.

NABET members received an immediate 3.5 percent pay hike, and will receive subsequent pay raises of 3.5 percent in 2007, 3 percent in 2008 and 3 percent in 2009. The contract expires in 2009.

## Jurisdictional changes

NPR executives maintain that the jurisdictional changes had to take place in order for the network to transition to a digital newsroom. Sporkin said NPR is in the process of implementing some of the modifications.

**We strongly feel we should be able to go to an audio engineer to perform mixes if we feel we are not up to doing the task ourselves.**

— Richard Harris,  
NPR/AFTRA

"AFTRA signed a new multi-year contract earlier this year that includes the right for NPR to make jurisdictional changes within the AFTRA contract, and gives journalists and NPR managers the right to edit sound on desktop computers and at audio workstations," Sporkin said.

NABET and NPR bargainers say both sides conceded to some minor changes to what was originally deemed NPR's final and best offer in January, which NABET technicians voted down. The new contract includes a provision for the sides to interact through a "mutual gains" process which "we believe will create a more effective structure in which to discuss disputes and concerns," Sporkin said.

"Mutual gains" is described by the National Center for Dispute Settlement as a "structured, step-by-step problem-solving process that centers on identifying the underlying interests of the parties and then creatively developing solutions, which address those interests."

"We hope there will be a greater sense of a shared vision for the future and everyone's opportunities within it," Sporkin said.

Mark Peach, president of NABET/CWA Local 31, confirmed that NPR's broadcast recording technicians no longer have final say on audio quality issues.

"Certainly they will still have a strong say in what gets to the air and what isn't up to NPR standards," Peach said.

According to the contract, as part of broadcast recording technicians' responsibilities, "NPR will be notified as soon as practicable when any NPR audio has been deemed objectionable by a BRT. Instances and patterns of substandard audio reaching air will be the subject of review at the regular meetings of appropriate engineering and programming staff."

Peach declined to comment further on contract specifics or the changes to jurisdictional work rules.


For their part, AFTRA leaders say they fully expect NPR to address the work assignment issue with them in the near future.

"We are open to the idea of our members doing some of the work. It's work that needs to be done and work that I feel our members could handle adequately," said Ken Greene, associate executive director for the Washington/Baltimore AFTRA local, which represents about 375 NPR reporters, producers, anchors and editors in the production unit.

Green said the issue is a "low priority" for the union, but said it looks forward to discussing the issue when approached by NPR.

Richard Harris, an NPR science correspondent and AFTRA negotiator, said, "Generally, AFTRA members like the flexibility of being able to perform tasks, such as desktop mixing, when they feel comfortable and confident that the audio quality will not suffer. We strongly feel we should be able to go to an audio engineer to perform mixes if we feel we are not up to doing the task ourselves."

AFTRA's main concern with taking on additional job responsibilities was that "NABET had not willingly relinquished those duties" prior to NPR assigning them, Harris said.

NPR's Sporkin described the network's relationship with AFTRA as a "collaborative approach to labor-management" that has worked well for both sides. 



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## LPFM Amendment Makes Headway

Sens. John McCain, R-Ariz., and Maria Cantwell, D-Wash., persuaded members of the Senate Commerce Committee to include their LPFM amendment as part of S. 2686, the Telecom Act rewrite.

The language, if passed by the Senate, would instruct the FCC to drop third-channel protections of full-power FMs in order to fit more low-power stations into markets. McCain has pushed the language before and it has passed the committee only to die on the floor.

Democrat Frank Lautenberg of New Jersey included an exemption that would prevent new LPFMs from acquiring a frequency in his state; the exemption is for full-power FMs "licensed in states with more than 3 million housing units and a population density greater than 1,000 people per square mile."

Full-power noncoms that carry radio reading services on their subcarriers would be exempt and receive third-adjacent channel protections.

The Prometheus Radio Project said the vote "marks a major step towards the expansion of low-power FM radio to the large cities of the United States, and potentially hundreds, if not thousands, of other communities across this country."

NAB lobbied hard against the LPFM language. It urged lawmakers to defeat the amendment and "preserve clear radio signals for listeners."

Its efforts include distributing to lawmakers e-mailed MP3 recordings of purported third-adjacent-channel interference.

Prometheus dismissed NAB's CD as "misleading." NAB spokesman Dennis Wharton replied to Radio World, "There's nothing misleading about the interference documented by NAB."

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Xport’s *aacPlus* and Low-Delay MPEG AAC deliver superb fidelity. G.722 coding enables connections with 3rd-party codecs, too.



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DIGITAL NEWS

# XM Wants to Work With IBOC

**WASHINGTON** XM wants to transmit its signal into HD Radios.

The satcaster applied for a patent in December 2005 to send its signal — as

well as that of MP3s, CDs and other digital sources — via IBOC. Such a scheme would keep its signal digital throughout the entire transmission path, it says in an application published in June by the U.S. Patent and Trademark Office.

In the patent, XM states that its digital signal is “ideally received by a digital

satellite receiver for best audio reproduction, but in many instances an analog frequency modulation technique is utilized to reproduce the digital signal to take advantage of existing FM receiver car audio hardware. ... Unfortunately, in any digital to analog conversion, the quality of the output signal may be degraded.”

Plus, “with the emergence of FM digital IBOC DAB, radios made to receive and reproduce such digital signals will be able to provide additional advantages not yet contemplated in the reproduction of quality audio (and other data) from sources other than the FM digital IBOC DAB signal. Thus existing systems fail to contemplate taking full advantage of the digital quality of digital radio in reproducing quality digital output from auxiliary sources.”

In the patent application, XM also describes a satellite radio receiver that can also be operated in other RF bands, such as “L-band or UHF front end for use with DAB systems in other countries.”

Calls to XM for comment were not returned.

reported last year that they had completed an interoperable antenna design.

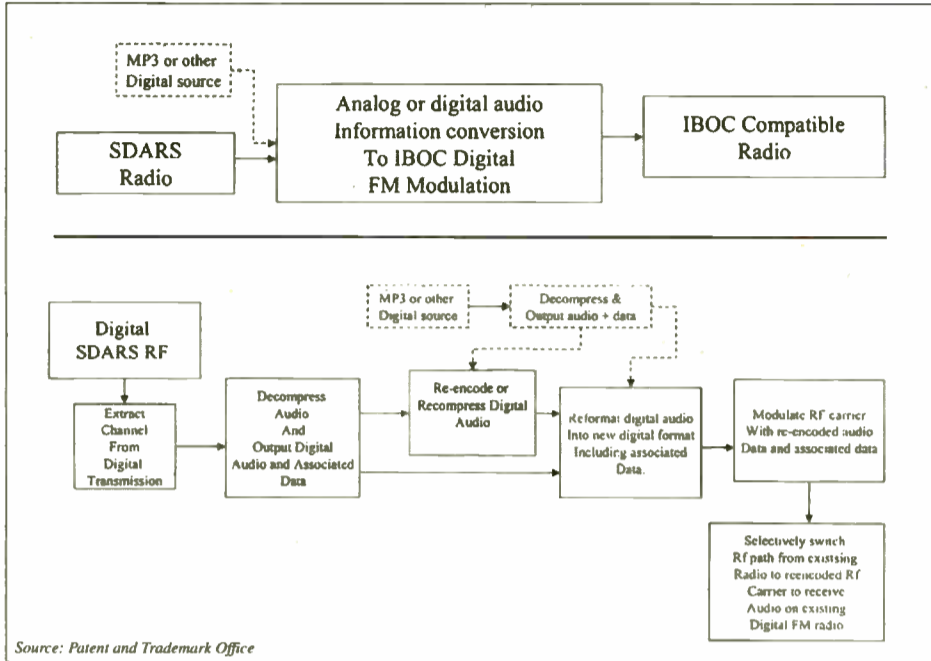
At CES in January, the companies told RW that interoperability efforts were continuing, with teams from XM and Sirius working on the project. A joint venture founded three years ago by Sirius and XM, called Interoperable Technologies and based in Deerfield Beach, Fla., now has a Web site; it recently stated simply “Coming Soon.”

In a recent filing with the Securities and Exchange Commission, XM said an interoperable tuner design had not yet been completed.

Neither satellite company responded to requests for comment. Previously, they have downplayed how soon a truly interoperable model — a tuner with one antenna that receives signals from both companies — could be manufactured. They blamed the different satellite constellations and audio coding schemes as adding to the chip costs for the radio. XM’s satellites are fixed in position; Sirius’s satellites are not. XM uses Coding Technologies’ CT-aacPlus as its audio encoding technology with Neural Audio’s pre-processing software; Sirius uses Ibiqity’s Perceptual Audio Codec.

The companies in the past have cited what they called the enormous challenges of convincing a receiver manufacturer that it would be cost-effective to build and market an interoperable satellite tuner.

— Leslie Stimson



Source: Patent and Trademark Office

The proposed frequency path of XM’s signal, as shown in an XM graphic. At least one auxiliary source is converted from one digital format to another using a digital radio. The bottom drawing is a more detailed example; a satellite radio serves as the auxiliary source and provides a digital signal modulated for use with an IBOC radio. Alternatively, the module can modulate a signal from another source such as an MP3 player.

## Satellite

## Interoperability Takes Next Step

Satellite radio companies have been working on an “interoperable” radio for a while, as required by the FCC. RW

# AM Multiplexed Directional Antenna Systems For The Digital Revolution

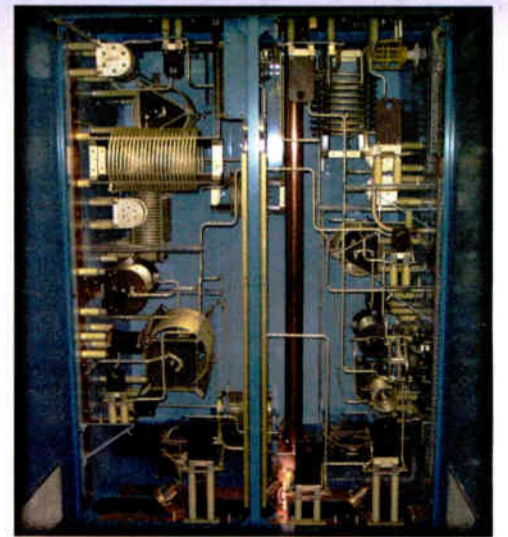


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## ◆ NEWS WATCH ◆

## Clear Channel Expands 'Disaster Hubs'

**SAN ANTONIO** Move fuel and backup equipment closer to where disasters strike and where more stations can access that gear. That's part of Clear Channel Radio's emergency preparedness plan.

Formalizing its emergency "hub" stockpile system used in last year's hurricanes, Clear Channel has developed a satellite system and procedures to use to better prepare for future disasters.

The company's Disaster Assistance & Response Team has developed a backup satellite system that it says will enable any of its stations to broadcast local programming directly to any of the company's tower sites when microwave links or land lines are down or fail.

Transmitters, studio equipment and newsgathering packages have been installed in trucks and RVs at company hub cities. Generators, satellite phones fuel and supplies are being installed at the hubs, as are portable towers on trailers.

First hub cities are Atlanta, Orlando, Philadelphia, Sacramento and San Diego. The company is focusing on hurricane-

prone Gulf States now and plans to establish additional hubs in the future.

The hubs are meant to be no more than a day's drive from Clear Channel's local markets.

## More Sirius Devices Flagged

Auto equipment maker Directed Electronics said it received a letter from the FCC stating that its Sirius ST2 and Sirius S50-C wireless devices are out of compliance with emission limits or the

applicable operating frequency range.

In an SEC filing, Directed Electronics said the commission seeks information regarding the certification, manufacturing, importation and other matters relating to these radios.

Directed Electronics says it will cooperate with the FCC and work with Sirius and DE's "contract manufacturers" to make necessary modifications, obtain new equipment authorizations where appropriate and minimize supply disruptions to retailers. DE has distribution rights for the products with Best Buy and Circuit City.

The S50 was one of the wireless satellite radio devices tested by Meintel, Sgrignoli & Wallace for NAB. The engineering consulting firm said the S50 apparently violated the Part 15 limit of 48 dBuV/m with an average of 74.7 dBuV/m tested on three frequencies.

## News Roundup

**SPOT LOADS:** The average big-market commercial station has reduced its spot load by one minute, according to data company Media Monitors. Spot breaks two years ago averaged 8 minutes 30 seconds per hour. Media Monitors now puts the figure at 7 minutes and 30 seconds. The use of 30-second ads is up; units per hour fell from 9 to 8.4.

**BOSCH BUYS TELEX:** Telex Communications Holdings signed a merger agreement with a subsidiary of Robert Bosch GmbH. The latter will acquire Telex for \$420 million, including the assumption of Telex debt. Telex makes brands including Electro-Voice, Dynacord, Klark Teknik and RTS.

**RADIO DISNEY:** The mouse network inked a deal with mSpot to put Radio Disney on mobile phones. mSpot Radio is a mobile radio service that streams 100 channels of content including music and news.

**JIM WOODS:** The former Harris executive is back in broadcasting, heading up Google's station automation operations at dMarc Broadcasting. dMarc said Woods would manage the release of the next generation of Scott SS32 and Maestro automation systems.

**BURK & URSANAV:** Burk Technology and Ursa Navigation Solutions signed an agreement under which UrsaNav will install Burk equipment and provide follow-on training and support. "Burk Technology will continue to concentrate on system sales, manufacturing and software development," the manufacturer stated, quoting Director of Government and International Sales John Hartzell.

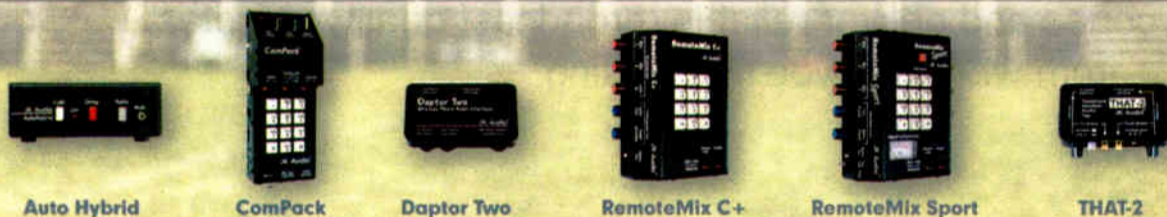
**URBAN LPFM:** Hoping to expand the reach of LPFMs into urban areas, the National Federation of Community Broadcasters is working with a number of organizations. President Carol Pierson stated in a newsletter, "It would be very helpful to hear from full-power stations, especially NPR members, any stories about working with LPFM stations in a positive way." She also called for stories from LPFM stations about good experiences working with full-power stations.

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“With Axia, setting up new routing configurations is easy; you just **save new routes in software and recall them** when you need them. SmartSurface makes controlling our many different audio sources and destinations very straightforward and uncomplicated; our air staff loves it!



“I knew how expensive routing equipment was. I also knew we’d regret buying a system with fewer capabilities just to save money.



“More than anything, we wanted to **avoid limiting our operations** with the use of conventional

routers. Most of those systems force you to plan, during installation, for every signal routing configuration you might ever possibly need. If your needs change, you either have



to re-wire or settle for operational compromises. Not very user-friendly! Making sure that the system was **easy for non-technical air talent** to understand and operate was critical, too.

“Axia addressed all these concerns.

“And **expanding the network couldn’t be simpler**. Just plug in more audio nodes and boom! you’ve got more inputs.



“I’ve worked with lots of equipment in the past 30 years, and **Axia is by far the easiest system**

to install and get up to speed with. There are just a few cables instead of hundreds; the entire installation – with testing – took just *one week*.

“Here’s the kicker: **Axia cost about half** what we would have paid for a conventional router. We’re very pleased, and plan to expand the network to our second control room. My advice? **Get Axia.** You won’t be disappointed.”



— Rudy Agus, Chief Engineer, Hi-Favor Broadcasting  
Los Angeles, California



[www.AxiaAudio.com](http://www.AxiaAudio.com)



Radio World, August 2, 2006

Past columns are archived at [www.rwonline.com/reference-room](http://www.rwonline.com/reference-room)

# Look For Those Tiny Bubbles

by John Bisset

Yes, antennas and line sometimes will leak air. But if you're losing tanks of air on your pressurized FM lines, more than likely you will find the problem on the ground.

Armed with a fresh tank of air, pressurize the line to about 3 psi, as read on your regulator. Then spritz a bottle of Formula 409 or similar brand cleaner on the manifold, fittings and regulator assembly and along the hose connecting them. A multitude of little bubbles will point to your leak if it's on the ground.

You may be able to fix it, using a procedure contributed by Paul Sagi of Kuala Lumpur.

Paul recently traced a slow leak to a valve. It turned out the leak was a slow seepage around the valve stem, caused by the packing not sealing properly. Since he didn't have any graphited asbestos

valve packing, and would not want to use it anyway, perhaps being overly cautious because of the asbestos, he took a length of Teflon pipe thread sealing tape.

Paul rolled the tape to make a thread, then doubled it and rolled it again. His goal was to obtain the length and thickness needed for the cavity under the packing nut. The fix works fine, and since the valve is not turned very often, it's lasted a reasonable time.

Paul Sagi can be reached in Kuala Lumpur at [pkasagi92@gmail.com](mailto:pkasagi92@gmail.com).

\*\*\*

B. J. Crabb from WFTA(FM) in Tupelo, Miss., wrote about the exhaust fan shown in the June 21 *Workbench*. Where do you find one?

A good place to start is the Grainger catalog. If you don't have it handy, go

online to [www.grainger.com](http://www.grainger.com) and select "HVAC>fans" — you'll find 37 different fan categories. The site has a PDF catalog that you can download, but stock a ream of paper if you're going to print it out. You're better off contacting them for

Ira Wilner of Wilner Associates, a broadcast engineering and technical services firm, writes that the current production run of Boston Acoustics Receptor HD Radios do not function as described by Cris Alexander in our June column. As this product is evolving, there will probably be more changes in the future.

Here's the latest update from Ira.

## 1. Locking a station into analog:

- Tune to the desired station.
- Press the "alarm 1" and "alarm 2" buttons simultaneously and release.
- This will put HD station into analog and keep it there.
- To return to the HD mode, tune away from the station and then return to the desired station.

## 2. To get to the technical menu:

- Tune to the desired station.
- Hold down the "clock" button for 15-20 seconds.
- You will get a master display with the following selections:
  - Version
  - Hardware
  - Audio Process
  - Tuner ROM Writer
  - Split Mode
  - Load Default Value
- Pressing the clock button will exit this top menu.

your own copy.

Grainger also has in stock the big blower motors used in high-power transmitters, as shown in Fig. 1. Even if you don't have the budget for a spare, note the model number and cost. This info can be a lifesaver should you lose your transmitter blower.

See WORKBENCH, page 16 ▶

## 3. Scrolling through the menu

- Left knob scrolls up and down.
- Pressing the left knob takes you to the submenu or makes a selection.
- Pressing the "display" button goes back to the previous menu.
- Pressing the clock button will exit from the top technical menu.

## 4. Split mode

When you enter the split mode the radio will play at full volume.

## 5. Workaround for (4) above.

Use the headphone jack. You cannot adjust the volume with the front-panel knob on either the speakers or headphones when in the "split mode."

## 6. Additional headphone weirdness:

- Sometimes, when you plug in the headphones the speakers will not mute. If this happens you can put the receiver into the standby mode with the on/off switch, plug in the headphones, then turn the receiver on.
- The same thing happens occasionally when you unplug the headphones. The speakers will not unmute. So if that happens, put the receiver in standby with the on/off switch, then pull the headphones and turn the receiver on.

Reach Ira at [bdct@vermontel.net](mailto:bdct@vermontel.net), or visit his web site at [www.wilnerassociates.com](http://www.wilnerassociates.com).



Fig. 1: Keep a spare blower motor on hand for that inevitable failure.

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[www.AxiaAudio.com](http://www.AxiaAudio.com)

# Workbench

► Continued from page 14

★★★

If your nitrogen tanks aren't secured as seen in Fig. 2, you're playing with fire — or missiles.

A fire marshal once told me about a tank that fell to the floor, breaking off the regulator; the pressurized tank turned into a projectile, blasting through two cinder block walls and ending up in a field outside the transmitter building.

Don't take a chance. Keep caps on unused tanks, and secure those in use. Thanks to Paul Shulins at Greater Media Boston for sharing the tank securing methods.

★★★

Have you poked around your AM coupling network or phasor lately? With the



Fig. 2: Don't launch a missile. Keep nitrogen tanks secured.

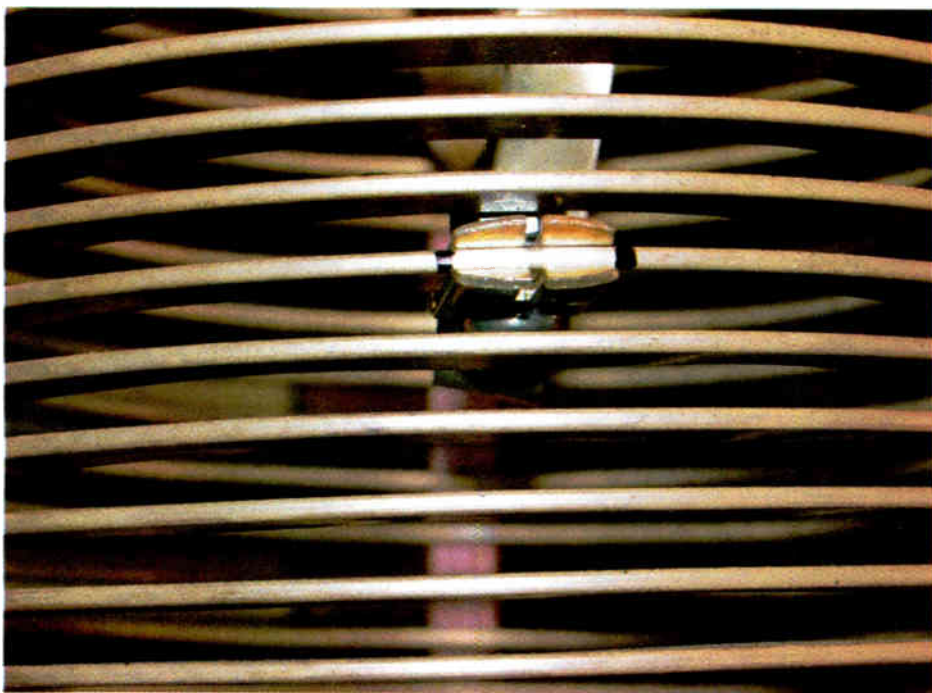


Fig. 3: Mark the location of AM coil clips with a permanent marker.

parameters all within tolerance, now's a good time to mark the location of all coil taps.

As seen in Fig. 3, a Sharpie brand indelible marker is used to mark either side of the clip. This must be done when you're off the air. The result, however, is insurance should a coil clip drop off or burn. You'll save hours of time resetting the coil to the marked location. Thanks to Grady Moates at Loud and Clean for sharing this useful tip.

If you like stories about building stations from the ground up, visit [www.loudandclean.com](http://www.loudandclean.com) for a reprint of an RW article by Grady about building an FM in Bermuda. It's great reading.

*John Bisset has worked as a chief engineer and contract engineer for 37 years. He is the northeast regional sales manager for Broadcast Electronics. Reach him at (571) 217-9386, or [jbisset@bdcast.com](mailto:jbisset@bdcast.com). Faxed submissions can be sent to (603) 472-4944. Submissions for this column are encouraged, and qualify for SBE recertification credit.*



Users and suppliers can e-mail news to [radioworld@imaspub.com](mailto:radioworld@imaspub.com).

Meeting Services Inc. used AKG microphones for the NAB2006 keynote addresses. The company specified several Harman Pro Group products including AKG CK-47 and CK-80 hypercardioid mic capsules and WMS 4000 Wireless Systems, as well as JBL Professional VerTec VT4888 mid-size line arrays and JBL VRX932 LA line array speaker systems. The keynotes were produced by Mark L. Layton Productions. ...

Crawford Broadcast has purchased Wheatstone Bridge Routers and Generation-6 control surfaces for three clusters.

In Denver, CBC is upgrading four air studios, replacing 1999-vintage Audioarts boards with Wheatstone G-6 surfaces and converting its infrastructure to the digital Bridge Router. In Detroit, the company is doing the same with three air studios.

In Birmingham, Crawford is building out a new 10,000-square-foot studio facility in a recently-acquired building. It will feature one BR and five G-6 surfaces plus new Tek Line studio cabinets in 10 of the studios. The facility will feature separate control rooms for three HD2 formats. ...

AirPlay Direct said users of its Web-based digital delivery system now include Clear Channel, Sirius Radio, NPR, Live 365 and CBS station KROQ(FM) in Los Angeles. The system allows artists and labels to make music available directly to broadcasters. ...

Mayah said about 200 of its codecs were used for coverage of this summer's World Cup games. Users of the Centauri/Centauri II Audio Gateway codecs include German TV and radio broadcasters. ...

Classic Communications FM stations KWFX and KWDQ used a Jampro JHPC-10 R 10-bay sidemount antenna with radomes and a Jampro combiner, at a new tower in Woodward, Okla. ...

Dalet Digital Media Systems said the Hellenic Broadcasting Corp., national broadcaster of Greece, chose the DaletPlus Media Library to digitalize and streamline its media archive system. The system is to be deployed by PTS, a Dalet business partner in Greece. The broadcaster operates 28 radio and four TV stations. The project involves "decades' worth of tape material," the company stated. ...

Nassau Broadcasting in Princeton, N.J., purchased 200 Boston Acoustics Receptor HD radios from Broadcasters General Store to support listeners on HD2 channels. ...

Harris said two public radio services are using its DATAplus data content management software. The Classical Public Radio Network and JazzWorks will use DATAplus to augment programming with content data, allowing concurrent informational display for listeners on HD Radio, RBDS analog radios or Web streaming. It can include title and artist info, promotions, weather and traffic info. ...

Broadcast Electronics received orders through SCMS for nine HD Radio systems and two booster systems from West Virginia Public Broadcasting, which operates the statewide West Virginia Public Radio service. Included are transmission and signal generation equipment for turnkey HD Radio conversion of the nine WVPR stations. Bill Acker is director of broadcasting and technology for the organizations. ...

Rose City Radio Corp. signed with Paladin AdSolutions to use RadioAd.com at KXL(AM) and KXJM(FM) in Portland, Ore. The service provides an online searchable database of radio advertisements, which radio listeners can use to find and replay ads they heard on the radio.

## Worried about Translator Hijacking?

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Empire State  
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Sears Tower  
1,450 ft.



Taipei 101  
1,670 ft.



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In just a few short years, Omnia has emerged as the best-selling audio processor in the world. More importantly, it's the most successful stations in top markets like New York, Los Angeles, London, Paris, Rome, Beijing, Tokyo, Amsterdam and Berlin, that have put Omnia on top. And more broadcasters are upgrading every day, using Omnia as their secret weapon to stay miles above the competition.

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## ENGINEERING MANAGEMENT

# Manager or Janitor? You Decide!

*Surprising Perceptions About Engineers, and What You Can Do to Change Them*

by Frank Grundstein

Last fall I had the privilege of participating as a panelist in Vern Killion's "Nuts and Bolts" session at the Madison SBE Broadcasters Clinic.

Most of the topics and questions were of a technical nature, and many centered on HD Radio and its implementation; but eventually the discussion turned to staffing problems and the plight of the industry in attracting new younger engineering talent.

We looked around. It was obvious that the engineers present were well into their mid-life crises if not past. This topic has become commonplace in discussion groups. It rears itself when engineers gather at SBE meetings and put out pleas for recommendations to fill the rare assistant's job that has become open.

After lamentation over loss of people, the comments often turn to reasons for the exodus: low salaries, being on call 24/7, the low esteem from other departments. Finally, the conversation is directed toward trying to figure out why executives view the engineering manager as different from other managers in the station.

## Terms

First let's note that the person we term a *chief engineer* is actually an *engineering manager*:

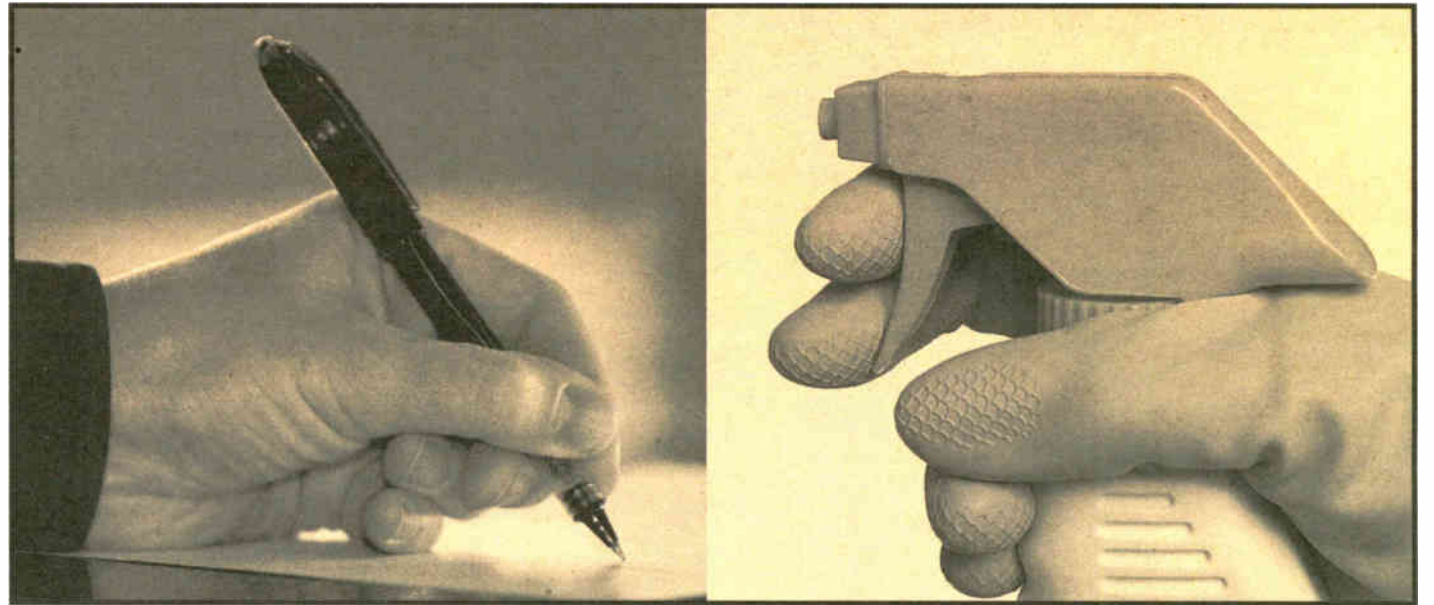
Managers are responsible for scheduling their own time. They are not told what to do with every minute of their time.

Managers have goals they must achieve so that the health of the organization is sustained. Two important goals for us in radio are staying on the air and assuring the viability of remote broad-

casts as programming elements and revenue streams.

Managers are responsible for budgeting and expense management. Often the engineering budget also includes elements from the promotions, sales and programming departments, even general services.

Managers often are responsible for legal compliance issues with governmen-



tal regulatory agencies.

Managers have unique knowledge. You are the source of all technical information about the technology of broadcasting and its implementation; today that knowledge may cover not only transmission systems and audio implementation but IT and telephone systems. Your knowledge will lead the station to implementation of new technologies, many of which will contribute to the station's financial success.

OK, you are a manager. You're an *engineering manager*. Your role is important to the life of the station. So why aren't you treated like other managers? The answer is partly industry custom and partly your own approach to the job.

## Perceptions

The customary impression of a chief engineer is the guy who comes to work, fixes stuff and leaves. He is never around when we want him; and he just spends the station's money. If this sounds like

their jobs; he also asked market managers their feelings about engineers, and he compared the results, paraphrased here. They are revealing.

*Engineer:* I like that it's not a 9-to-5 job.

*Market Manager:* Engineers keep weird hours and are never around when you need them.

*Engineer:* I like that it's not exclusively an office job.

*Market Manager:* Engineers hate paperwork and usually put it off until the last minute.

*Engineer:* The job offers me the freedom to invent, improve and build things.

the way your general manager would describe your job, you suffer from an old stereotype of the chief engineer.

How do you break free from this stereotype?

Terry Baun, president of Criterion Broadcast Services, has developed a paper, "Management Skills for Engineers," presented at the Ennes Workshops, illustrating why the chief is often his or her own worst enemy in the effort to change these perceptions. Terry asked engineers why they like

*Market Manager:* It's hard to keep engineers focused on the task at hand.

*Engineer:* My prime directive is making the signal the best it can be and minimizing downtime.

*Market Manager:* Engineers don't understand the importance of working well with other departments.

*Engineer:* I'm able to set my own priorities.

*Market Manager:* Engineers tend to go off on their own and don't understand the goals and focus of the business.

*Engineer:* I enjoy the variety of tasks and responsibilities that broadcasting offers.

*Market Manager:* Engineers need to improve their time management skills

Baun also found that market managers think engineers can't explain technology well to non-engineers who need to know about specific issues.

Sound like you picked the wrong job? You didn't; but we need to do some work to change these impressions. With all their other responsibilities, it is unlikely our market managers are going to invest the time required to understand us. So we must try to develop at least a minimal understanding of what they value.

## Plan of action

The list above offers us a start at understanding how we can be perceived. Here are suggestions to combat those perceptions.

- Establish defined times when you are at the station. — Make it a habit to be at the studios at the beginning and the end of the day. In this way, other departments

See MANAGER, page 19 ►

# The Fabric of Time

Broadcasters have woven ESE precision master clocks and timing-related products into their facilities for over 35 years. ESE products accurately synchronize broadcast operations using a choice of GPS, WWV, Modem, Crystal or line frequency for affordable, reliable, perfect time.

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# Manager

► Continued from page 18

know there are definite times when they can reach you.

This concept benefits you and every staff member. Station staff will know they can reach you and will not feel they have to escalate every problem into a fire drill that requires paging you. It also significantly reduces the number of pager and cell phone calls you get when you are working on projects outside the station that need your full attention.

Make your schedule known. Many stations use Microsoft Outlook as a common calendar. Is your schedule on it? Your market manager will be glad to know what you are doing and when you can be reached conveniently.

Make engineering a part of the station team. Managers like to know that everyone in the boat is "pulling" in the same direction.

• *Do your budget on time.* — Make a concerted effort to contact departments you're required to help with budgeting; do so early in the process. Don't let the inability of other department heads to complete tasks on time appear to be your failing.

Present the budget in such a way that your market manager knows you understand what you are asking for and how it will affect station finances. Meet with your manager and discuss how capital spending affects station profitability. This also will help you understand how to justify requests and demonstrate that you are aware of the business elements to your job.

• *Obtain management training.* — Your market manager spends thousands of dollars a year on sales training. Suggest that you be sent to a management training seminar. SBE offers one at its headquarters in Indianapolis each year.

• *Become an SBE member and get certified.* — Letters after your name are a good thing. Lots of letters? A better thing. Hang certifications in your office where people can see them. Ever go into a doctor's office and not see a wall with diplomas and certifications? People should know you are an expert in your field.

• *Learn to speak non-engineering.* — When you start to explain technology, do people's eyes glaze over? Watch for this and be able to reduce the explanation to terms non-engineers can understand.

Most of the time, your co-workers don't want to know the implications of packetization on audio performance. They just need to know there's going to be a 1/4-second delay and how you're going to solve that problem for them. You can discuss propagation delay at SBE meetings or lunch with other engineers.

Sometime soon, your technical expertise will influence the station's revenue stream significantly as your station prepares for the implementation of HD Radio. You want managers and staff to see you as a source of help rather than confusion.

• *Dress like a manager.* — Perception is reality. If you look like a janitor, people will treat you like one.

OK, look like a manager at least *some* of the time.

Many stations have adopted "business casual" as *de rigeur* even for managers. Dress that way when you can. There are

some jobs that just need jeans and a T-shirt. But you shouldn't be wearing them to managers' meetings. You don't go to managers' meetings? Start. If you want to be viewed as a manager, you have to be where managers are.

When you accompany a salesperson on a call to arrange for a remote, dress like the salesperson, even if that means jacket and tie. To someone you're meeting for the first time, clothing is a visual cue as to how to react to you. It can be a cue to how you perceive your own worth and your worth to the station.

• *Keep records for your annual performance review with the market manager.* — I know a former chief, now a well-known developer of audio processing, who kept a detailed log of how many seconds his major-market station was off the

air during the course of the year. I believe he averaged 47 seconds of unplanned or emergency outages annually.

What you do affects the bottom line; demonstrate that you are aware of this. When you save the company money through renegotiating a contract or lease, document it. If you find a new revenue stream for an SCA, point it out.

• *Take your manager to lunch and talk with him about projects on which you are working.* — Take key managers to your transmitter site or sites. I know they don't really want to go, but you can find a way to get them there. A lot of the station's capital is invested there. They should know how it is spent and the problems to which each site is subject. This will make them understand more fully why you are not always in your office.

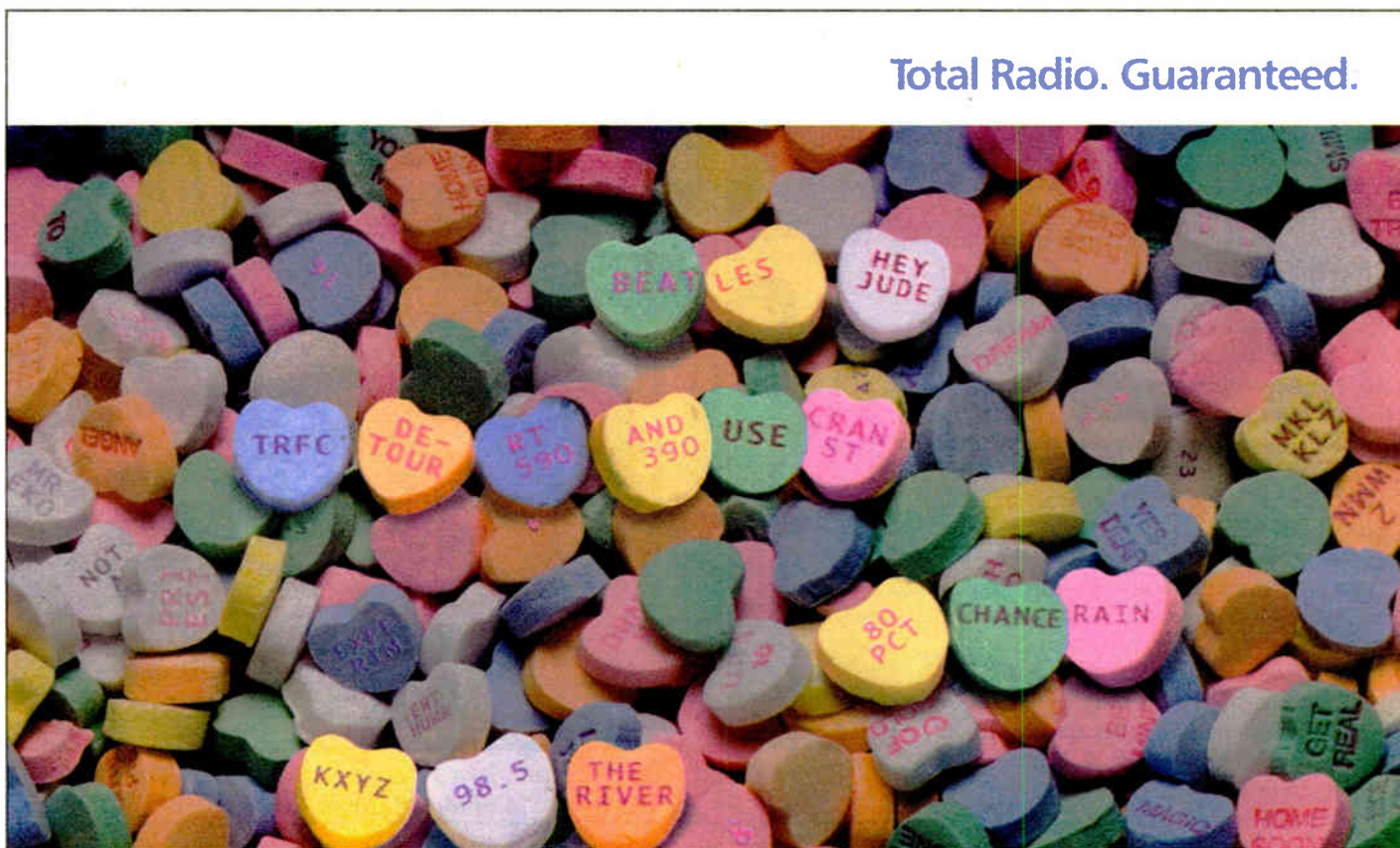
As Terry Baun points out, "Broadcast engineering is the only job where excellent performance without documentation eventually will result in your dismissal."

When my plumbing is working, I don't need a plumber on staff. Your market manager doesn't need a plumber either; he needs an engineering manager.

If you can't implement all of the changes I have talked about, pick a few and try them. They'll go a long way to changing the perception of you from janitor to manager.

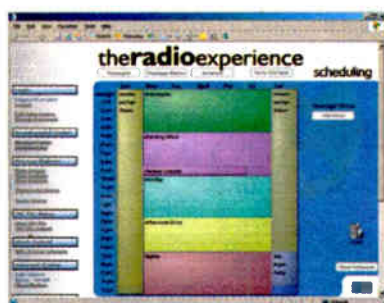
*The author has worked as a radio chief engineer, video facility manager and equipment sales executive. He is domestic sales manager for Logitek; opinions are his own.*

*How can a person be a more effective radio engineering manager? Tell us at radioworld@imaspub.com.*



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GUEST COMMENTARY

## Chicago HD-R: Good, Bad & 'Spooky'

Radio Engineer/Owner Evaluates Digital Radio At 'Street Level' in the Windy City

by Larry Langford

As a long-time Chicago radio engineer and air talent, and more recently the owner of a little kilowatt in southwestern Michigan, WGTO(AM) in Cassopolis, I have a vested interest in HD Radio. I must start by saying that I am not the biggest supporter of Ibiquty Digital.

The FCC process that granted the IBOC system as now implemented is, for me and many others, highly suspect to say the least; and the thought of perpetual license fees just irks me.

Not enough was done to study this system for the now-known interference issues before we got this far. The fact that HD Radio carriers extend past the permitted envelope for analog should have been a red flag that interference could be an issue. This is among the reasons other parts of the world rejected in-band digital in the first place.

We should have done more investigation of other systems or explored other ways to do digital, such as the Eureka-147 system used in Europe and Canada that uses different spectrum for digital and does not attempt to use the same spectrum now used by broadcast stations.

The FCC over-granted TV spectrum many years ago in the United States, assuming a much greater need for UHF TV. It later saw the error and fixed it by removing TV channels 70 through 83.

I am sure spectrum could have been found for new radio digital broadcasting if it had been a true priority. But some of us think politics may have had a hand in not going for new spectrum that would have leveled the playing field among all

stations in a market; 500-watt AM stations would enjoy the same coverage and sound as 50 kW FM outlets.



CE Bob Fukuda at the racks serving new digital studios of CBS stations WBBM(AM-FM) in Chicago.

I am enough of a realist to know that would not sit well with major multi-station owners who fear increased competition from the Ma and Pa stations still on the air. HD Radio as now set up preserves the coverage differences between more powerful stations and weaker ones in the same market.

But that notwithstanding, it looks like HD-R is here. I went out and purchased a Boston Acoustics Receiver Radio HD and tried it out in Chicago.

The radio itself has the typical light

and flimsy feel of modern-day receivers that are more air than anything else. It powered up well and right away I was able to identify several Chicago FM stations using HD-R and some were utilizing the second digital outlet. The rat-tail antenna supplied showed a tendency to

not allow easy digital lock. Using a cheap wire dipole was much more successful.

### Listening in

There's not much difference to the average listener over analog FM unless you're plagued by some really bad intermod. Most of the stations using FM HD Radio in Chicago still use the same aggressive processing they do for the analog channel, so the hope of relaxed CD-style audio is just not a reality.

Some of this can be blamed on the

need to match the analog and digital for blending in and out. The delay in having the digital come on was not really a bother to me as the analog was there right away. Most stations using the second digital channel had the good sense to back off the processing a bit. Since it was after sundown when I got home to play with this new radio, the AM stations had already shut off their HD Radio signal.

The next morning I got to play with the AM side.

Here is where some remarkable things are going on. WRL(AM), a Clear Channel expanded-band oldies station at 1690 kHz that is diplexed on 1390 kHz over a directional array, had a very nice HD Radio sound.

The most noticeable thing is the dead quiet background — rather spooky for AM. The morning show features Chicago radio legend Larry Lujack, who uses a digital line from his home out in the western states someplace. With analog, both he and local host Tommy Edwards sounded about the same.

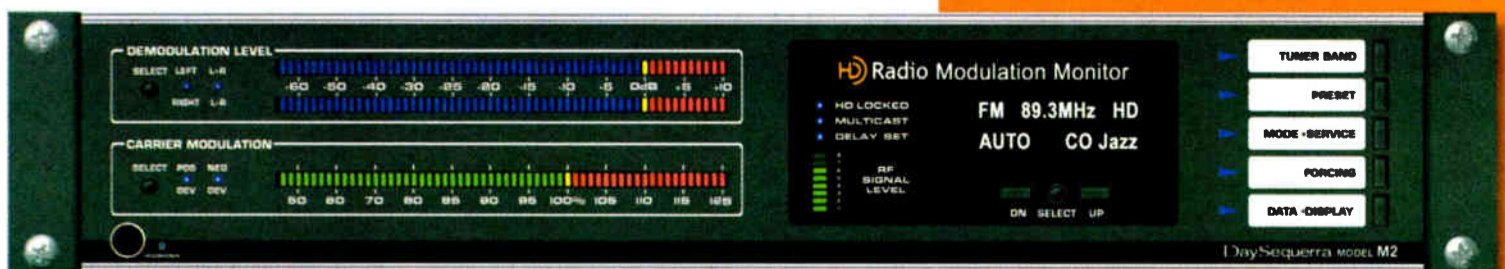
On HD-R you can tell the difference between the local and the remote audio. The digital audio is so good that you can hear the slight degradation of the remote feed coming into the station studio from Larry Lujack vs. local jock Tommy Edwards, who is in the studio — a testimony to the clarity achieved with HD Radio.

The AM-side audio response on the Receiver in digital sounded about the same as a GE SuperRadio in city-grade contour, which ain't bad. Clear Channel-owned 1390 kHz WGRB, playing gospel, sounded overly processed on the digital side but such a sound seems to be the norm for gospel formats.

CBS station WBBM at 780 kHz was not exactly on its game during my test. The digital audio was a bit torn, thin and overly sharp while the analog side seemed to have a bass boost going.

CBS' WSCR at 670 kHz was much See CHICAGO, page 22 ▶

## M2 HD Radio Modulation Monitor

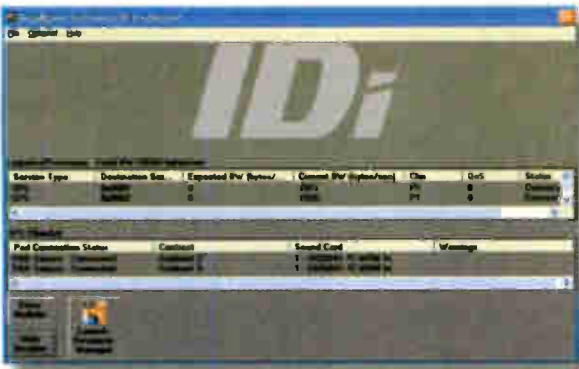


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## Radio World's HD Radio™ Scoreboard

The HD Radio Scoreboard is compiled by Radio World using information supplied by iBiquity Digital Corp. and other sources. The data shown reflect best information as of June 28. This page is sponsored by Broadcast Electronics. HD Radio is a trademark of iBiquity Digital Corp.

### HD RADIO IN DALLAS-FORT WORTH, TEXAS

Station	Freq.	Format	HD2 Format	Licensee
KMKI(AM)	620	Children		ABC
KAAM(AM)	770	AdStd/Nstlg		Crawford
KRLD(AM)	1080	News		CBS
KMGS(AM)	1160	Urban/Oldies		First Broadcasting
KZPS(FM)	92.5	Clsc Rock	Americana	Clear Channel
KDBN(FM)	93.3	Clsc Rock	New Adult Hits	Cumulus
KSOC(FM)	94.5	ClHts/R&B0d		Radio One
KSCS(FM)	96.3	Country		ABC
KTYS(FM)	96.7	Country		ABC
KEGL(FM)	97.1	Span/Oldies	Hispanic AC	Clear Channel
KPLX(FM)	99.5	Country	New CHR	Cumulus
KJKK(FM)	100.3	Jack	My HD (all requests)	CBS
WRR(FM)	101.1	Classical		City of Dallas
KDGE(FM)	102.1	Alternative	New Alternative	Clear Channel
KDMX(FM)	102.9	AC	Commercial Free Mix	Clear Channel
KESN(FM)	103.3	Sports		ABC
KTDK(FM)	104.1	Sprts/Talk		Cumulus
KLLI(FM)	105.3	Talk	Hispanic Talk	CBS
KHKS(FM)	106.1	CHR	Kiss Espanol	Clear Channel
KOAI(FM)	107.5	Smooth Jazz	Traditional Jazz	CBS
KESS(FM)	107.9	Span/Mexcn		Univision

The HD Radio Bottom Line  
Total Licensed On the Air

1,420 834

Last Month  
Total Licensed On the Air

1,401 802

Market Penetration  
United States  
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(excludes LPFMs)

Number of  
FM Stations  
Multicasting:



278

■ Licensed by iBiquity and on the air  
■ Licensed by iBiquity and not on the air

## HD CONVERSION DIGEST

# AM Antenna Mods for IBOC Operation

*The Second in a Series of Hands-on Tips About HD Radio Implementation*

by **W.C. Alexander**

Next to the transmitter compatibility issue, antenna compatibility is the biggest obstacle that AM stations wishing to convert to HD Radio operation must overcome.

In some cases, the cost of making the antenna system IBOC-compatible may exceed the HD-R equipment costs. A well-designed and maintained antenna system may be good to go for IBOC already, but it is likely that at least some modification will be necessary.

detector and impedance bridge or it can be done using a vector network analyzer, power amplifier, directional couplers and RF attenuators. Which method is used is not as important as the results, which will be plotted on a Smith chart and analyzed.

## Adjusting DAs

The antenna bandwidth specification for AM HD Radio operation calls for symmetry of the load impedance at  $\pm 5$  kHz with a VSWR of 1.035:1 or better,  $\pm 10$  kHz VSWR of 1.20:1 or better, and  $\pm 15$  kHz VSWR of 1.40:1 or better. A

antenna tuning unit network inputs. An operating impedance bridge should be used to check the impedance "seen" by each transmission line looking into the ATU.

This is usually a two-person job. One person stays in the transmitter building and tunes out the insertion effect of the bridge, re-establishing licensed parameters on the antenna monitor, while the other goes from tower to tower with the OIB making measurements.

For best impedance bandwidth, it's important to adjust each ATU for a match to the transmission line that feeds it. Tightly coupled high-power towers will have more effect on impedance bandwidth than lightly coupled low-power towers.

Negative power flow parasitic towers, particularly those with low driving point impedances, can have a great impact on impedance bandwidth of the common point. If you're not familiar with directional antenna systems and their adjustment and operation, it's better to leave this procedure to someone who is.

For optimum HD Radio performance, the rotation of the Smith chart plot

should be within the transmitter manufacturer's specification. That optimum orientation is something that the transmitter manufacturer will need to provide, however, it's likely that some field measurements will have to be made before the manufacturer can give an answer.

The manufacturer likely knows what the optimum orientation is at the power amplifier (module) output, but the phase shift through the combiner(s), filter(s) and output-matching network for a given frequency and transmitter may not be known. The manufacturer may have you measure this with an oscilloscope and a pair of 100X probes.

Unless you find your antenna to be within the specification and at the proper orientation, it is likely that you will have to hire a consulting engineer to evaluate the data along with the existing antenna phasing/coupling system design and make some recommendations. This will be money well spent, and as it may take awhile, it is essential that you do this very early in the conversion process. In fact, it should be done *before* you order any other equipment, in case you find that your antenna system cannot be made HD Radio-compatible.

Got a suggestion for a future topic? E-mail [crisa@crawfordbroadcasting.com](mailto:crisa@crawfordbroadcasting.com).

The author is director of engineering for Crawford Broadcasting. 

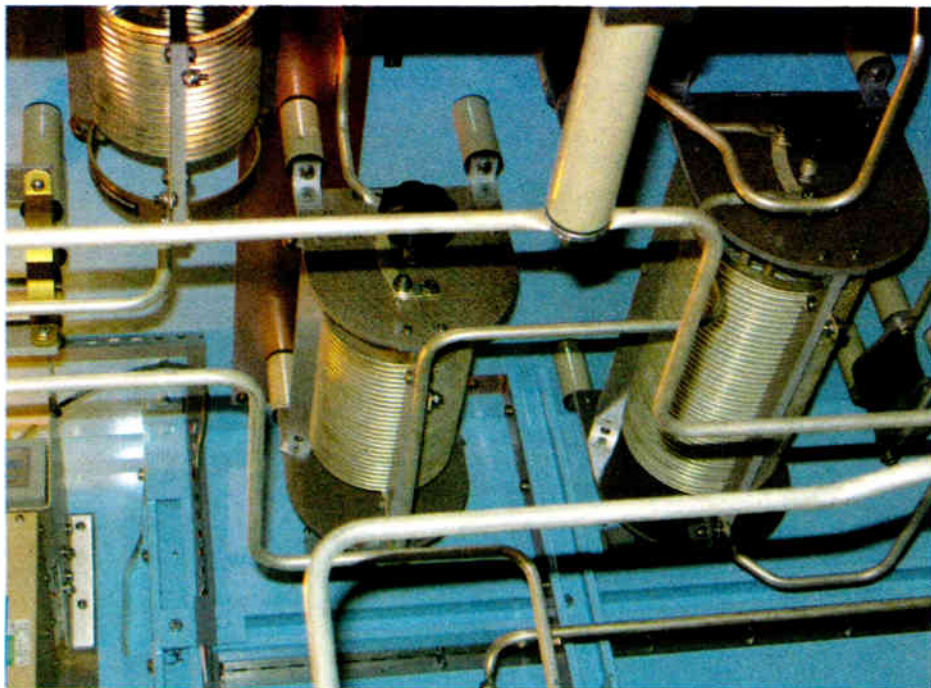


Photo by Cris Alexander

Shown, a typical directional antenna common point bus and network

Whether directional or non-directional, *Step One* is to perform a sweep of the common point or antenna tuning unit input. The sweep should include a span of 30 kHz, from carrier to a point  $\pm 15$  kHz in 5 kHz (or smaller) increments. This can be done using a synthesizer/

sweep of the antenna input impedance will quickly show whether your antenna system is in compliance with this specification.

If the antenna input sweep shows that the system needs work, a good place to start with directional systems is the

## Chicago

► Continued from page 20

better. The HD Radio was easy to listen to and reminded me of listening to the program line. But the digital and analog were out of sync and each time the radio had to re-lock on the digital, which was often, I had to hear the last few seconds of analog repeated.

To my surprise, the ABC/Disney stations like WLS(AM) were not in HD Radio.

### Can you hear me now?

One of the questions that recurs in HD Radio discussions is the usable range of the digital signal. What I found surprised me.

WTMJ at 620 kHz in Milwaukee, about 100 miles north, has a readable signal over most of Chicago but there was substantial hiss and noise, especially on the south side of Chicago where I live. You know very well you are not listening to a local station.

I played with the external loop that comes with the radio and was able to get enough signal for the Receiver to switch and lock onto digital. Now that was a heck of a contrast!

I could not detect the reverb the station uses on the analog signal with all the noise, but on the digital it was perfectly clear, clean and the reverb was there, even though the analog signal was a lot less than optimum. So in this case, the digital signal provided reception in excess of the primary analog pattern.

The Receiver is a decent radio albeit rather pricey, but it's not going to go down as a super box. It did have a fault during my test.

For some reason it started sounding like a bad CD, chattering on every HD station I tried to tune in. Like a computer, I did a hard reboot by pulling and reinserting the power plug and it was okay.

Will the public buy this radio for HD Radio? I would not think they will run to grab them unless they are AM buffs who

want to hear the dramatic difference, and see the display work like FM with song titles and artist. For the FM listener, there is just not that much difference, especially to pay \$300 for.

The second channels often duplicate a format already available on another station. Then there is that pesky "no nighttime AM HD Radio" issue. I do not think the public will stand for it any more than they would if color TV had been given restricted hours of operation.


My little AM station is still running C-Quam Stereo but alas, I realize the handwriting is on the wall. I am curious as to how we will solve the nighttime HD-R situation. The truth is that allowing a digital service that cannot function at night seems contrary to the stated claim by proponents that AM and FM would be on the same level playing field.

Not only does FM get new channels with HD Radio, they get to do them 24/7. Once again AM is the stepchild. Is the only answer the total demise of analog, as TV will do by 2009, for a 100 percent digital signal?

Leonard Kahn says he has a day- and night-compatible system with Cam-D but I think the Ibiqity train has left the station. One thought is allowing AM stations that transmit virtually no night sky-wave, such as a Class D at low-power and post sunset, to keep HD-R on at night. But that would do nothing for the 50-gallon operations.

Personally, I will look for an HD Radio for my Ford Crown Victoria. The service has promise if the issues that present themselves are worked out.

Larry Langford is chief engineer and owner of WGTO(AM), Cassopolis, Mich. He worked for CBS, ABC, Westinghouse and independent stations in Chicago from 1966 to 2000. He can be reached via [wgtoradio.com](http://wgtoradio.com) or [larrylangford@aol.com](mailto:larrylangford@aol.com).

What is your experience with HD Radio in your market? RW welcomes other points of view to [radioworld@imaspub.com](mailto:radioworld@imaspub.com). 

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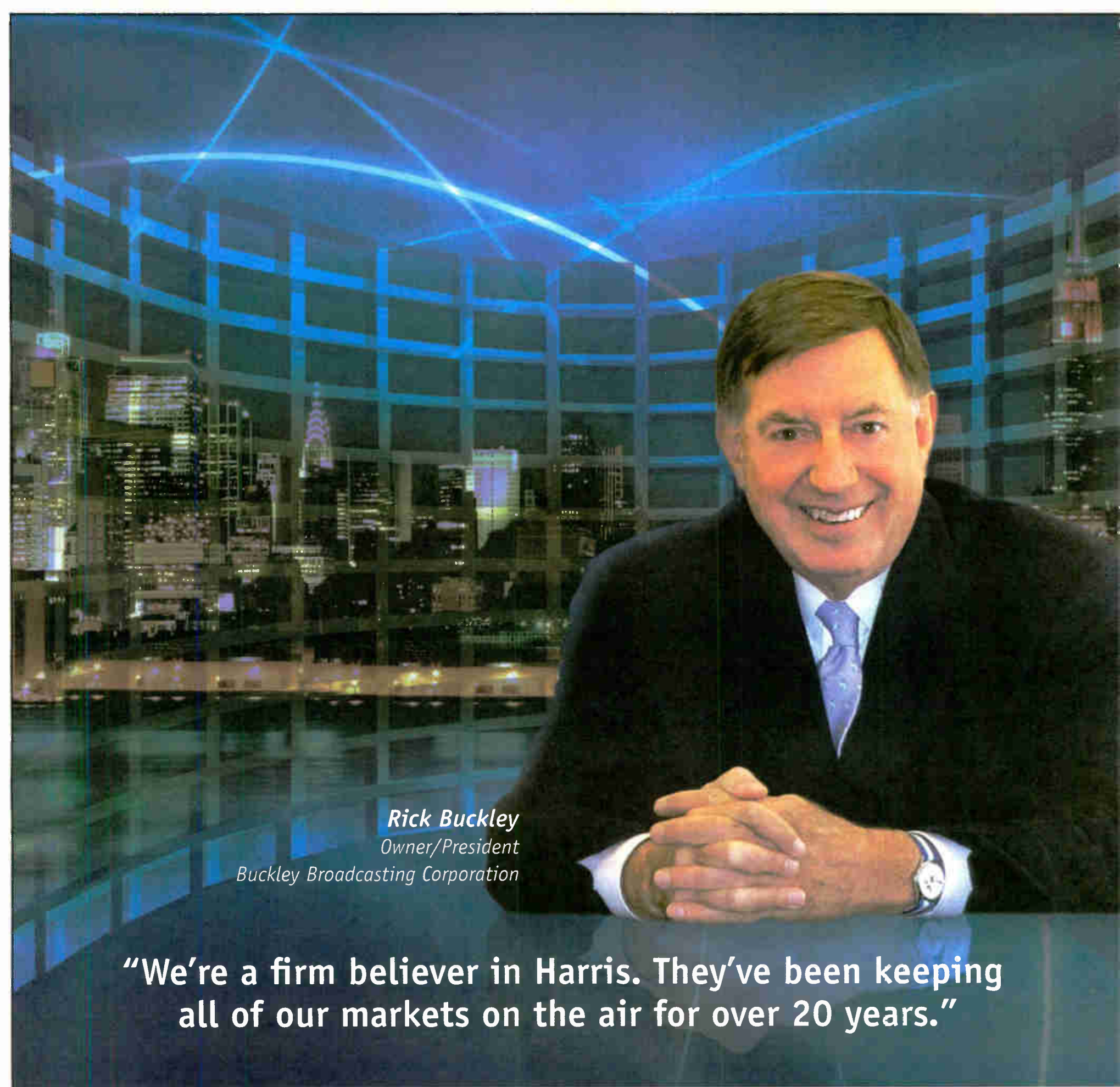
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## GUEST COMMENTARY

# AM Will Compete in an HD-R World

*The Band Has Created Its Own Programming and Niche, and in Most Markets Is Insanely Successful*

by Robby Robinson

The excitement leaving May's SCMS seminar about HD Radio was palpable.

There he was, Ibiqity Digital's Scott Stull, vice president of broadcast business development, beaming about the number of HD Radio stations going live and how many were planning on being launched in the next year.

The equipment guys had their display booths decked out with the latest technology that would allow you to multicast, stream messages and broadcast in digital. Heck, there was even a company that would finance it all.

During lunch, the engineers discussed when their stations were going to begin the process of transitioning their signal to digital. The programming guys, well, the programming guys were acting like kids at Christmas who just got all these new toys but had no earthly idea what to do with them.

HD Radio is coming; and while there aren't a whole lot, or virtually any, radios in the country right now, this technology is too good not to be mainstream sometime soon.

And as I was leaving Charlotte that day with my bag full of catalogs, brochures, charts, graphs and even some weird light/screwdriver/pen thing I got from a equipment presenter, a thought crossed my mind.

What does all this HD Radio stuff mean for those of us on the AM dial?

There are those who think HD Radio could be the worst thing that happens to the AM band. They say its inability to multicast coupled with the onset of more choices on the FM dial will make it obsolete.

I don't believe a word of that.

The advent of HD Radio will have an immediate effect on those of us on the AM side of the dial. From everything I've gleaned from those who seem like they're in the know, mainly Scott, the affable Ibiqity guy, when our stations are ready to invest in the technology, we too will be able to broadcast in digital. That means our AM signal will sound the same as FM currently does.

## AM (I) ready?

This is a good thing. Actually, it's a great thing. While it's pretty easy these days to tell the difference between the fidelity on AM and FM, can you honestly tell me there's a ton of difference between music on FM and music from your CD? I can't, and I feel like I have a pretty good ear when it comes to such things. So AM stations will immediately be back in the fidelity game. Who-wah.

Let's get a couple of things straight up front about AM radio. It is a viable, successful and very capable medium right now.

Think about what AM has done in the last 10 years. With very little help of music, it has *created* its own programming and its own niche and in most markets has been insanely successful with it.

News/talk, sports talk, all-business, all-news, all-traffic and weather, these are formats that wouldn't be in our vernacular if it were not for AM.

Do three or four stations dominate the ratings of each market? Well, no, but that makes very little difference to those of us who are actually in the business of selling and programming AM radio; and believe

of the fidelity or the inconvenience of pushing the "AM" button on a receiver will be over.

## Local on the 8s, 9s, 10s and ...

Over the last four or five years AM has slowly seen some of its great programs move to the FM side of the dial, and there's nothing indicating that's stopping anytime soon. Rush giveth in the '90s, but he's somewhat taking away in the new millennium.

And while with some syndicators this might happen later than sooner, with satellite radio and FM's multicasting abilities, if AM radio thinks that it can continue to lean on its syndicators to fill its airwaves, AMs will be left in not



Robby Robinson

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it or not, there are a lot of us, more than 5,000 stations at last count.

If anyone thinks AM won't continue to reinvent itself, once again he or she will underestimate the capabilities of the band that has been an enormous part of radio since its inception.

## AM evolution

It's been written that digitizing AM radio is like trying to cram 10 pounds of potatoes in an 8-pound sack. I don't buy that a bit. In fact, I bet that's the sentiment of most major-market, major radio group engineers who have five FM stations to take care of.

Who can blame them? If you have five FMs to transition to digital, I can't imagine turning your AM adult standards stick to HD-R seems to make much sense.

But for those local owners AM stations, the "mom and poppers" who don't have to call New York to check with corporate and whose technology budget has to do with this month's billing, HD Radio is an opportunity to improve what you're providing your listeners, and, if you're not careful, attract more to your dial.

Think about it. In 15 years, all the FMs are in HD-R, and let's say they all have an HD1 and an HD2 signal. If there are 30 FM stations in your market, that means there will be 60 different formats to choose from. So, how many preset buttons do these new FM radios plan on having on their faceplates?

My point is that I imagine there's going to be more to it than just having your favorite six presets. If you've got a signal that covers your metro population, and you're broadcasting in digital, I think the days of people forsaking AM because

only satellite radio's wake but in HD Radio's dust.

So what is this piping hot technology called HD Radio going to do to AM? In the long run, HD Radio is going to force AM to do things better on a local level during more of its dayparts. News/talk, sports talk, news anchors, traffic reporters; they are all going to have to be better than their competition, not only on satellite but on whatever HD3 station an FM station tries to dabble in.

The old axiom of "doing one thing better than everyone else" will be even more valid in an HD-R world. While a radio group with five FM stations will have 10-15 formats to coordinate and program, AM radio can focus on what it does best.

Listeners will find the best programming, they will listen to it and they will buy the products advertised on it. AM radio must make certain that such programming is broadcast in high definition on their frequency, not some HD3 band.

*Robby Robinson is general sales manager of Kirkman Broadcasting in Charleston, S.C., which owns sports station ESPN Radio 910 The Team, news/talk Real 1340 and all-news CNN Radio 1450. Reach him at [robby@kirkmanbroadcasting.com](mailto:robby@kirkmanbroadcasting.com).*

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FIRST PERSON

# The Demise of Playa de Pals: Final Chapter

by David L. Hollyer

It took only a few seconds and about 32 pounds of dynamite to bring down and destroy \$10 million worth of technically sophisticated antennas that had taken years to design and construct.

The destruction brings to an end an era that utilized high-power shortwave stations to reach the Soviet Union with news and information with broadcasts in its own languages. In this field, the station at Playa de Pals on Spain's Costa Brava, with its specially designed antenna arrays, was one of the most effective shortwave stations to reach the Soviet Union on first hop — and Central Asia on second hop, with a little slewing. It had done this job for the United States government for more than 40 years.

In the March 1, 2003 issue of Radio World, I described the process that closed the shortwave operation at Playa de Pals and turned back the land to the Spanish government, "mothballing" the installation and leaving its ultimate fate in limbo.

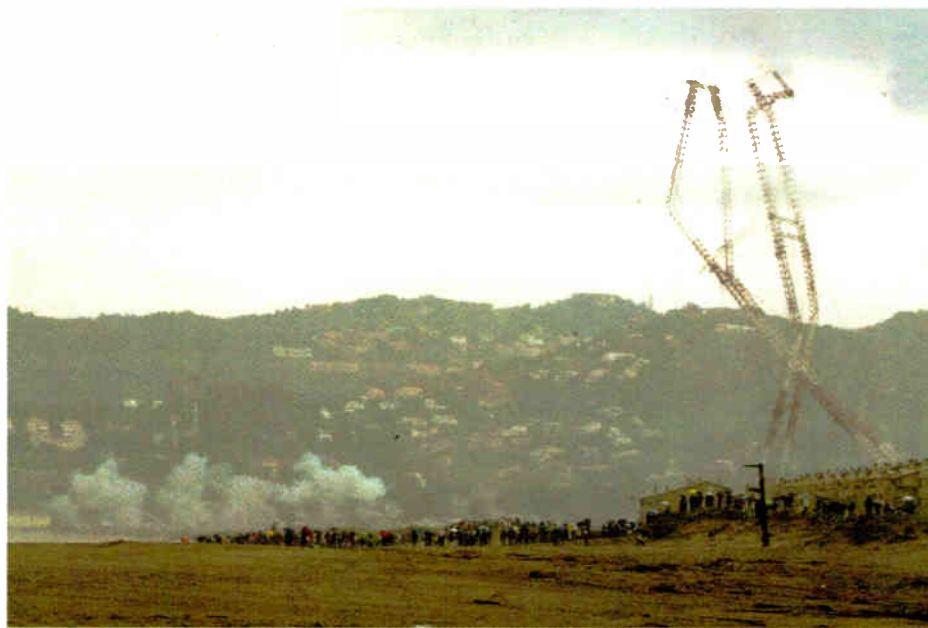
One option was destruction of the antenna to clear the land for eventual use as a park. Now it has happened.

## Cheering destruction

During the afternoon of Wednesday, March 22, the company charged with blowing up the antennas sounded the warning, cleared everyone from the beach and touched a button that fired off dynamite charges on the towers and brought them down.

The self-supporting towers for Antenna Group "A" and "C" were felled by exploding charges at their bases. The remaining guyed towers that supported Antenna Groups "B" and "D" were knocked down by destroying one of the three guys on each tower, causing them to fall toward the beach.

It was heartbreaking to those of us who had worked at the station and admired the great antennas to watch videos of their ultimate destruction. Yet not everyone was saddened by the event. Some viewers were ecstatic, as evidenced by the cheer that went up as the antennas toppled. [An amateur video is available at [www.youtube.com](http://www.youtube.com);



type "Demolición Antenas Radio Liberty" into its Search field.]

Thousands of curiosity seekers and members of the media found advantageous spots to watch. The nearby hill town of Bagur, the small mountain of Torella de Montgri and boats out in front of the antennas on the bay were ideal spots to utilize telephoto lens on camcorders and digital cameras.

It is unreal to view the videos. One sees flashes as the dynamite exploded

and the towers began to buckle. Group "D" towers, the highest, seemed to fall in slow motion as though the 540-foot masts were reluctant to relinquish their lofty stance and crash down into the Mediterranean and onto the beach.

The destruction calls to mind a poem of Walt Whitman. To paraphrase, the towers went down with a great shout upon the hills and left a lonesome place against the sky.

The demolition would be followed

by cleanup of the scrap steel, all that remains of the structures, then destruction of the diesel power plant and its underground tanks and the deeply buried cement guy anchors for Group B and D antennas. They are set so deeply that they will only be excavated and removed to a depth of about 32 inches. There are tentative plans to use the building formerly containing offices and transmitters as some sort of a museum.

There are also vague plans to use the 81-acre site as a park with a great beach. Despite lofty sentiments from politicians about returning the site to the people, many cynical — perhaps realistic — Spanish citizens believe this gorgeous chunk of beach land will end up as a site for high-rise condominiums.

**With the dynamiting of the 13 antenna support towers, the installation of one of the world's great shortwave stations has been destroyed beyond recovery.**

In retrospect, the decision of officials of the U.S. government to cancel the lease and return the land to the Spanish government was, in my opinion, probably precipitous and ill-advised. With its existing antennas, the site could have been used to broadcast to Central Asia and reach the Muslim population. Alternatively, in order to provide ultimate flexibility for worldwide broadcasting, even to Latin America, one of the new high-power rotatable antennas could have been installed.

Expensive, certainly, but then again finding another site in the world as ideal as Pals would be next to impossible.

The author was managing director for Spain of Radio Free Europe/Radio Liberty. Contact him at [W4SG@aol.com](mailto:W4SG@aol.com).

## Fireworks Hit AM Station

A Pennsylvania station featured in an earlier article in RW was victimized by Fourth of July revelers this summer.

WAVL(AM) in Apollo, Pa., "Praise 910 AM," is a 5,000-watt Class A Christian station. Engineer Nick Markowitz Jr. said the vandals broke through two wooden barrier fences, put a large number of firecrackers under one of the tower bases and threw strings of fireworks into the Rohn tower lattice work.

The station, which was operating at full power at around 8 p.m., was knocked off the air, he said, "when the lightning gap balls flashed over from the heat of the fireworks, approximately four to six bricks' worth ... several thousand interconnected firecrackers were carefully and deliberately placed around the tower. Arson experts tell me there can be significant heat when it is done in this fashion," Markowitz said.

"I responded to the towers and found the damage. The individuals left behind valuable prints and evidence, which have been turned over to local and federal authorities. The individuals more than likely exposed themselves to RF radiation from the towers, and local news media were notified to warn individuals they need to be checked."



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- (2) XLR mic inputs (one mic/line)
- (2) 1/4" headphone jacks
- RCA line in and out; XLR balanced mix output
- Auxiliary handset input for use as a telephone

**JK Audio**

#### REMOTEMIX SPORT FEATURES:

- (3) XLR mic inputs (one switchable mic/line)
- (3) 1/4" headphone jacks; 1/4" headphone cue input
- Speaker and talkback microphone; VU meter

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# RIAA's License to Bill

*There's a Fine Line Between Streaming and Downloads. New Devices Are Erasing That Line*

by Skip Pizzi

With vacation season in full swing, many Americans are taking in the unique features of our U.S. landscape — Yellowstone Park ... the Grand Canyon ... our music licensing rules.

Yes, the U.S. stands practically alone among nations in giving its radio broadcasters access to all published music via so-called "compulsory" or "statutory" license.

This means that there is no requirement for a broadcaster to negotiate with or obtain permission from the rights holder of any musical work before airing it; such rights are stipulated by U.S. copyright law.

There are different versions of this "performance right" license for different types of "broadcasts," however. Free, over-the-air (OTA) terrestrial radio is exempt from royalties. This allows stations to play any music, any time, with no fees paid to any entity for the right to air the recording. (Under a separate license, there is a small fee paid to the *composers* of the song, but not to the recording company or performing artists for the right to air the recording of that song.)

Similar compulsory licenses exist for Webcasting (free or subscription) and satellite radio services, but these licenses do include various rates of royalties that

the distributor must pay to rights holders for the right to transmit the recording of a song, along with detailed reporting requirements and other logistical details that do not apply to the royalty-free OTA license. All of these licenses are specified in Section 114 of the Copyright Law (U.S. Code Title 17).

Importantly, all of these statutory performance licenses apply only to "broadcast" distribution. If a distributor wishes to *sell* copies of a recording, the performance right no longer applies, and the prospective seller must negotiate directly with the rights holders for the necessary "mechanical" and other rights.

## Upping the ante

Enter satellite radio, which recently has begun to offer a new class of MP3-player/satellite radio receivers that include tens of hours of digital storage capability, but with the additional ability to edit recorded satellite radio streams to save individual songs and discard others.

Because satellite radio broadcasts have always included title-and-artist metadata, this process can be performed by the user by simply scanning and sorting the music-library directory that such a device assembles after recording a portion of satellite radio music programming —

perhaps without even listening to the recorded broadcast. Other user features may be available on these devices to aid in the editing and selection of content that is recorded.

As this column has noted previously, the music industry (chiefly via its trade association, the RIAA) sees this new capability as a violation of the terms of the Sec. 114 performance license, which it views as applying only to real-time broadcasts, and not to what it calls "disaggregated, permanent storage" of individual songs. The RIAA feels that the ability to selectively edit and store individual songs from a radio broadcast is tantamount to a music download, and therefore satellite radio should compensate the rights holders of any such music accordingly. This is far from a semantic dispute, since music download services today typically pay about 10 times more per song to rights holders than what Sec. 114 subscription-service licensees pay.

For their part, satellite radio companies respond that this new feature is simply an application of consumers' fair-use rights to the content they pay to receive with their satellite radio subscriptions — just as with any off-air recording. They add, however, that in these new recorder/receivers, once the device is deauthorized due to the termination of a satellite radio subscription, any songs recorded from satellite radio on the device are automatically deleted. The songs are also limited to playback on the device only, and cannot be digitally copied to a PC or other device, and therefore cannot be burned to CD or redistributed to the Internet.

They also point out (although not as loudly) that the audio quality of the songs is affected by the satellite broadcast air chain — they are recorded in real time off the air — and that if users want high-quality copies of a song, they are directed

## The Big Picture



Photo: Gary Hayes, BBC

by Skip Pizzi

ing device sold in the U.S. today.

Nevertheless, RIAA has taken a two-track approach against the move, lobbying hard for clarification of Sec. 114 provisions through additional legislation, and meanwhile filing a lawsuit against XM Satellite Radio with high damage claims.

Elsewhere the record industry has suggested other, more tactical solutions, such as requiring devices to record entire radio programs (or at least in no less than 30-minute increments), with no ability for "cherry-picking" of individual songs. Another idea that's been floated would require the purposeful, randomized offset of title and artist metadata from its corresponding music by a few seconds, thereby making it difficult to select songs and manage libraries using the metadata alone.

## Curiouser and curiouser

Aside from the stated positions of the two parties in this process, a number of interesting circumstantial issues will complicate any resolution here.

First, consider that satellite radio is not doing anything different to enable this new service than what they always have done with their transmissions. It is only the *receiver* functionality that has changed, and these devices are made by third parties. Since satellite radio services are proprietary, however, any receiver maker has established a licensing arrangement, and perhaps even a subsidy or other partnership program, with a satellite radio provider, so the provider can be seen as "complicit" in the new devices' design. Also, the device-makers aren't licensing the content — satellite radio is, and it's the "reinterpretation" of this license by satellite radio operators to include selective storage that music companies are challenging.

Importantly, Sirius Satellite Radio has made an arrangement with RIAA to pay a hefty additional royalty (above the statutory AHRA fee) for each recorder/receiver sold. This deal apparently is what kept Sirius out of the RIAA lawsuit.

In fact, the Sirius approach of paying per device makes some sense, since it would be difficult to assess higher content licensing fees on a per-song basis when only a small (and unknown) percentage of receivers actually stores the content.

Finally, CEA has expressed concern that the RIAA's proposed legislation and pending litigation could chill manufacturers' innovation and interest this space.

Perhaps most important for terrestrial broadcasters is that the outcome of this struggle could determine the course that RIAA later takes toward similar devices that can receive and record IBOC signals. So even though the license in question doesn't apply to OTA radio, the current battle is germane to broadcasters' future, and well worth continuing observation.

*Skip Pizzi is contributing editor of Radio World.*

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**The outcome of this struggle could determine the course that RIAA later takes toward similar devices that can receive and record IBOC signals.**

to online music services to purchase a download (e.g., XM has an arrangement with Napster for such a service).

Further, satellite radio takes pains to point out that unlike download services, recording music via these devices is not a truly interactive process, in that the songs cannot be "ordered," and listeners have no advance knowledge of if or when a particular song will be played on any given channel. (The devices offered to date include only single tuners, and thus can only record one satellite radio channel at a time, which the listener must select.)

Finally, the satellite radio industry notes that collectively it currently pays more to the music industry via Sec. 114 royalties than any other entity, and that under separate legislation known as the Audio Home Recording Act (AHRA), additional royalties are paid to the music industry for each of the new recorder/receivers sold, as with any audio record-

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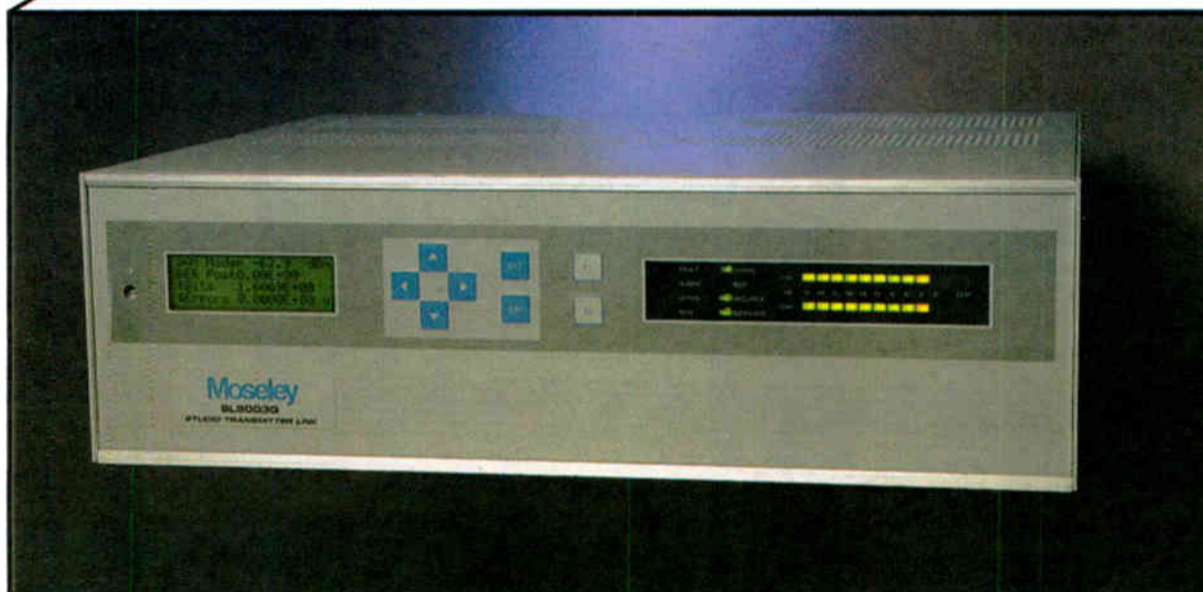


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FIRST PERSON

# Classic Radio Studio Circa 1973

by Ken R.

The biggest records (sometimes called “platters” or “stacks of wax”) of 1973 included “You’re So Vain” by Carly Simon, “Love Train” by the O’Jays and the seriously annoying “Tie a Yellow Ribbon Round the Ole Oak Tree” by Tony Orlando and Dawn. We played all these hits along with the oldies over and over and over, on top-40 WOHO(AM), Toledo, Ohio.

At that time I was a 22-year-old DJ, and AM was still king. Even though I had little talent and a voice that hadn’t quite matured, the lure of being heard on a 1,000-watt blowtorch was the imagined glory. This was fortunate for our gener-

al manager, who only had to pay us egomaniacs a pittance plus all the free Arby’s coupons we could steal from the prize cabinet.

The saving grace for the on-air staff was that we each hosted several record hops every weekend at \$50 a pop or we wouldn’t have been able to afford gasoline — which had recently skyrocketed to 55 cents a gallon. Heavens!

## A hot format

The accompanying picture of me, taken in our control room, shows five Gates Criterion cart machines and an RCA board that is probably sitting at the bottom of Lake Erie right now. Just outside the frame on the right are two turntables,



Ken R. at WOHO Radio, playin’ the hits



photo credit: Carol J Forman Photography

**Rick Adams**  
Director, Interactive  
Children’s Entertainment  
AOL Kids

which saw very little use; ours was one of the first stations to go “all cart.” Incidentally, the cart machines were always kept sticking out of their housing because otherwise they would heat up to whatever temperature at which metal melts.

Visible on the far left are three of our five big Gray Lab timers, which were more typically found in photographic darkrooms. There was one timer connected to each cart machine. We could set a timer for the length of the song or commercial in the associated cart machine and by pushing a homemade green button in the upper right corner of each timer, we could automatically trigger the next cart machine in sequence when the first timer swept zero.

This allowed us to load up three commercials, a jingle and record, start the first machine and leave the control room unattended for five or six minutes.

Late one night I selected “MacArthur Park” by Richard Harris and set it to segue directly into “Hey Jude” by the Beatles. Each of these songs is at least seven minutes long, as any oldies jock can attest. After a swingin’ introduction to the first song, I started our prehistoric automation, ran out of the studio, locked the station, jumped in my car and drove to McDonald’s to pick up some health food. As I drove I listened to my own show on the car radio and prayed I didn’t get stuck at that railroad crossing again.

On the counter to the far left of the picture is the hand-held remote for the Code-A-Phone, a device used to record hitline request calls while the tunes played.

Some DJs took advantage of their alleged fame by trying to arrange dates with young and impressionable female fans on the phone. I believe I’ll plead the fifth on that one.

Ken R. wrote a book called “Up and Down the Dial” about his misadventures in radio. This book and several others are available as e-downloads at [www.kenr.com](http://www.kenr.com).

## STUDIOHUB+ CASTING CALL

“Hi, I’m Rick Adams. I am executive producer, host, also producer, technical director, technical person, I make tea. This is my show. This is my studio. I do everything. This is an online radio show from AOL and basically we broadcast live here everyday using this fabulous board from our friends at Radio Systems. And of course, those are the people who brought you the extremely good and marvelous StudioHub which I will be talking more about later. This is my studio. We broadcast to over a million kids a week and we are very happy about it. That’s a million kids a week Awesome. Did I tell you, by the way, that we broadcast to a million kids a week.”

“Look, sure we use XLR’s. They’re very important. Look how nice they are. They are good, a very great thing and I’m glad we have them. I love XLR’s. The problem is, you’re like - I got this, but I can’t make it work with the other thing. If only you had Radio Systems StudioHub, right? Because then, you’d be able to get, like, use a CAT-5 or an RJ45, or whatever you call it.”

“See this? Genius! Genius! So, the StudioHub, is really a good thing. And it means if you’ve got this, you can just plug into anything. It’s really incredible. So, thank you Radio Systems. Thank you StudioHub!”

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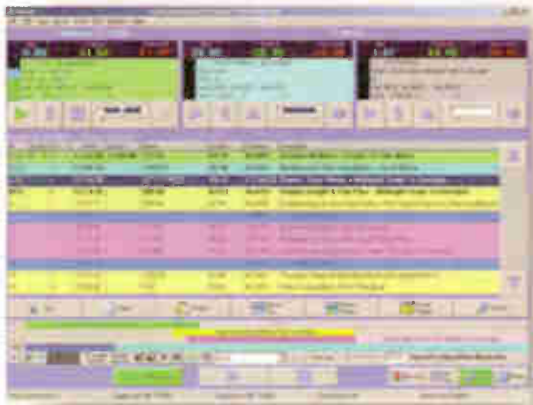
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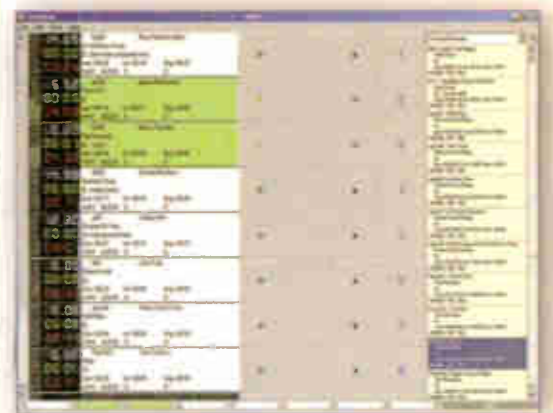
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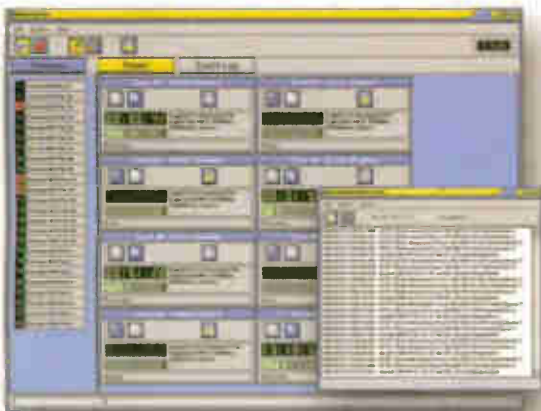
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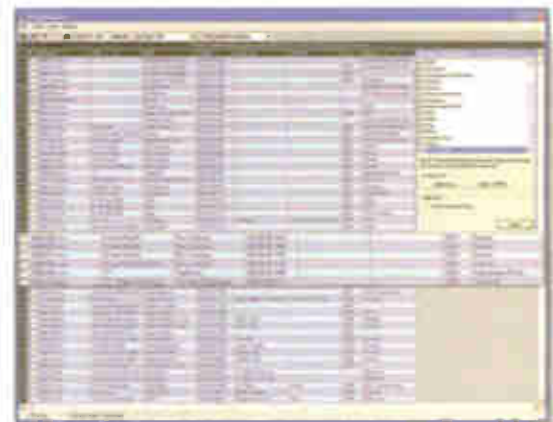
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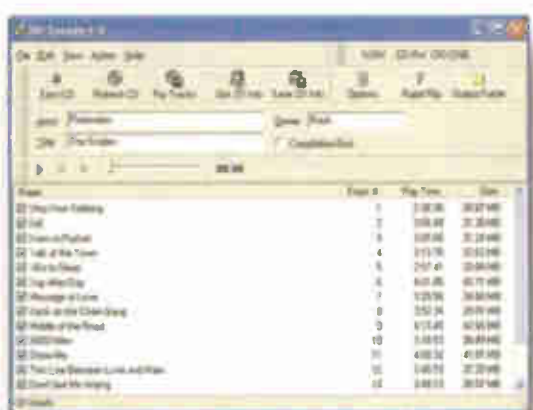
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# Studio Sessions

## Product Guide



## Inside

Radio World

Resource for Radio On-Air, Production and Recording

August 2, 2006

### PRODUCT EVALUATION

## Vorsis AP3 Lets Users 'Tailor' Sound

*Wheatstone Processor Offers 21 Factory Presets, Software, 16 Back-Panel Connectors*

by Bobby Gray

Wheatstone's Vorsis AP3 processor sat in the lobby for a day or two before I could get some space cleared on both my calendar and my desk to fiddle with it. I remember picking up the box it came in and thinking the company must have sent me a power supply to one of their Generation series consoles. The thing was heavy. I got it unpacked and immediately noticed the construction; it maintains its weight in a stylish way.

The Vorsis AP3 is a 1 RU chassis with a front face that exceeds the width of the box terminating in rack-mounting ears. I was pleased to see that rack-mounting has returned to being a priority to designers at an early stage of development as opposed to an add-on kit that directs the user to "remove four cover screws and bolt on the ears if you to want to rack mount it," which can leave the unit sagging into the rack under the weight of the wires.

Stations can use the processor for HD processing, or general signal processing of audio sources that are mic, line or digital AES. The Vorsis AP3 also can be used in postproduction.

I probably would have built the Vorsis in a two rack unit chassis, allowing the end user a little more space. The front panel is a bit cozy, however the button size helps alleviate this. The back panel also is rather crowded. I had to reach around the back of a processor a few times while working in the dark. Having the connectors spread out more would be helpful.

The left-hand side of the front panel is dedicated to six separate, multicolored LED displays. Above and beyond these displays are four bright blue LEDs showing the limiting status of each output and the expander of each channel.

### To the test

As I played with the unit into the late afternoon, I became aware of a developing problem down the hall in our control room. We were doing our normal three-market afternoon talk show from a chicken shack someplace, and the POTS codec was having trouble maintaining a connection at a decent rate.

I was informed that the POTS codec had stabilized, but at such a low connection rate the audio was really bad and

centered at about 2 kHz. We still had about two-and-a-half hours left to go, and hanging up and re-dialing to start the whole reinitializing process again seemed stupid.



During the next commercial break I used two microphone cables out of the remote kit to insert the Vorsis AP3 into the signal path between the output of the POTS codec and the input to my distribution amplifiers. I selected Preset 19: Vocals, one of the 21 already programmed, ready to use factory presets — a nice touch — by pressing the front panel Presets button and rotating the knob below the alphanumeric preset display window.

I asked for a line check from the remote and was pleased by the immediate change in the audio and let them back into the show. My cell phone rang within 20 seconds of the show resuming. It was the operations manager of my sister stations; he was at the remote and witnessing the low connection rate listening to the remote on his station in his car. He asked if we had reconnected at a higher rate. I told him what I had done, explaining that I had only connected two mic cables and pushed a button.

Pleased with the possibilities of improving it even farther, I began to teach myself the Vorsis AP3 while live on the air. I stepped through the factory presets while passing audio through the unit and settled on one that I liked even better — Preset 21, VOX-M, a vocal preset that did a fine job of allowing me to roll off some of the frequencies I had too many of, creating the effect that I had more of the frequencies I wish I had.

As for how it sounded? I was not able to notice any measurable audio differences from input to output while bypassing the processing, nor was I able to destroy my input audio at the output while pretending not to understand the settings or features it offers. The presets get you going right away, and you can start to tailor your sound as you become more familiar with the unit.

### Software control

I was pleased with the magnitude of control the software offers a user of the Vorsis. In seconds, my trusty, beater Dell Latitude had become interfaced to every adjustable setting on the thing. I could

change the screens from Input — where I could change from mic to line to AES, flip the phase of either or both inputs, set the pre-emphasis, select mono or stereo — to the Filter screen where I could diddle with a low- and high-pass filter with an adjustable notch.

The Expander screen activates when a signal falls below a predetermined level.

It had a Hang adjustment I liked a lot. This gave me some wiggle room between opening and closing the expander. There are individual screens and control settings for the De-esser, Parametric Equalizer, Compressor, Output and System sections of the unit.

The System screen allows you to select 44.1 or 48 kHz sample rates in addition to a one-click "auto follow" feature I could have used a month ago on a console install. It also offers the ability to derive dual mono, stereo from A or stereo from B, from the inputs.

The back panel is neatly laid out and has, counting the AC EII power connector, 16 connectors. Seven of them are XLR. Two of these are the mic/line analog inputs and each has a tiny green LED next to it to display the status of the front panel selectable input level. The AES input is available not only on an XLR but

### Product Capsule:

**Wheatstone Vorsis AP3 Digital Signal Processor**

#### Thumbs Up

- ✓ Clean audio
- ✓ Multicolored LED displays
- ✓ Factory presets; vocal preset in particular
- ✓ Software control
- ✓ 16 back-panel connectors; 7 XLR

#### Thumbs Down

- ✓ Heavy
- ✓ A 2 RU chassis might give the user more space
- ✓ Tight front-, rear-panel real estate

PRICE: \$2,995

CONTACT: Wheatstone in North Carolina at (252) 638-7000 or visit [www.wheatstone.com](http://www.wheatstone.com).

also an RJ-45 making it seem easy to connect to a facility-wide router system.

The closest thing I have to a router is the 4PDT relay in my air chain for the EAS. I was not able to play with this. The Vorsis is at home on an Ethernet network and impressed me with the ease at which I found it on our network. The outputs are XLR as well; analog channel 1 & 2 as well as two separate AES outputs.

Wheatstone has a multifunctional Vorsis site that lets visitors download the brochure on the AP3 for more information. Visit [www.vorsis.com/brochures.html](http://www.vorsis.com/brochures.html).

Bobby Gray is operations manager and chief engineer of WHOO(AM) SportsRadio 1080, and WAMT(AM) FoxNews Radio 1190 in Orlando, Fla. 🌐

### PRODUCT GUIDE

## Backbone Radio 4.1 Helps PDs Monitor Spots

Version 4.1 of Backbone Radio Pro from Backbone Networks Corp. is a turnkey Internet radio station software suite, compatible with Intel-based Macs. It has features for increasing revenue opportunities for online stations. Among these are clickable images and text that allow listeners to conduct e-commerce while continuing to listen to the radio program, and demographic feedback that facilitates targeted radio advertising.

The company says the software helps program directors decide what commercials to run at certain times of the day. Integrated real-time reporting tells the operator how many people listen to what programs, at what time, for how long and from where based on potential geographical mapping of IP listener connections. This feature permits broadcasters to target advertising to those listening areas.

Backbone Radio v4.1 was developed in Apple's Cocoa environment, and is compatible with iTunes to integrate automatic podcast generation into the radio mix. Broadcasters can Webcast their streaming programs while commanding the software to create, annotate and post podcasts made from the program material, pulled from the station's audio content database. The software also creates podcast chapters and inserts images specific to each chapter, playable on photo or video iPods.

For more information, contact Backbone Networks at (508) 753-5665 or visit <http://backbone.com>.

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**All you need to do is register online at [radioworld.com](http://radioworld.com). The winner will be selected in a drawing held in Dallas at the NAB Radio Show on September 21, 2006.**

If you are interested in purchasing this limited edition Heil Classic Pro broadcast microphone, visit [www.musiciansfriend.com](http://www.musiciansfriend.com) and place your order while this commemorative microphone is still available. You won't believe the price! Just think of what a great promo piece this will make at your next remote event. Not only does it look authentic, it sounds fantastic.



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## PRODUCT EVALUATION

# M4 Makes Smooth Transition to HD

*DaySequerra's HD Radio Tuner Has Display Presets, LEDs to Take Guesswork Out of Signal Acquisition*

by Rich Rarey

DaySequerra introduced its M4 HD radio tuner to market, in anticipation of AM and FM stations' need for accurate off-air monitoring of their analog and multicast HD channels.

The M4 is a smaller version of DaySequerra's M2.0, and it's an agreeable professional set-and-forget tuner. Its 1 RU size is suitable for the mounting in the back equipment room. It is a sophisticated device, from its upgradeable firmware (current version 2.0.4) to its bright vacuum florescent display — in DaySequerra's terminology, the "VFD."

The M4 is completely controlled by just eight buttons, and its operation is indicated by eight bright-blue LEDs in addition to its vacuum florescent (alpha-numeric) display. Two illuminated buttons on the device's right front side are what I consider primary controls that affect the functions of the "soft" Down, Select and Up buttons. Primary buttons include Tuner Band, which toggles between AM and FM; and Preset, which sets the secondary controls to jump between the 20 AM or 20 FM station presets. A second press of Preset will toggle between AM and FM bands, making it

easier to access presets without leaving the Preset mode.

When Tuner Band is active, momentarily pressing the Down or Up button will manually tune the M4 on frequency step at a time. Holding the Down or Up button will tune up or down faster. Pressing and holding the Select button for three seconds will place the M4 in preset-write mode; the user is required to choose one of the 20 preset locations by pressing the Down or Up buttons and then pressing the Select button again to write the frequency into that preset location.

Once tuned to a station, three bright blue LEDs on the M4's left front side are relevant. The HD Locked LED lights up

— and the VFD shows "HD" in its upper right corner — when the M4 acquires the Orthogonal frequency-division multiplexing (OFDM) portion of the HD Radio signal and the channel's digital carrier signal-to-noise is greater than 58 dB/Hz.

If a station has at least one additional HD Radio supplemental program service — I call them HD2 and HD3 — the Multicast LED will light.

If the station is delaying its analog FM signal to coincide with its HD Radio main channel audio and has set the delay bit in the data stream, the Delay Set LED will illuminate.

Once an HD Radio signal has been acquired and validated, three small buttons and corresponding lit-when-active-LEDs are relevant.

The Mode Service button toggles between the main HD Radio program and multicast program services, if any. Holding the Mode Service button down for five seconds forces the output to revert to the analog program.

The Forcing button places the analog program in the left output and the main

HD Radio program in the right output. This is helpful for aligning the analog-to-digital delay so both program services have the same audio at the same time.

The Data Display button toggles between the program-associated data on an HD Radio program service. Holding the button for five seconds displays "All Data" on the VFD and automatically toggles between the text data fields every five seconds. The default is the short station name displayed on the second text line of the VFD.

## Mix it up

Several features of the M4 are available by pressing and holding button combinations. Rear-panel balanced audio outputs are presented on 3.5 mm Eurostyle Phoenix modular connectors, and those output levels are adjusted by powering up the M4 and pressing either the Up or Down buttons. Different output levels can be set for AM and FM bands. Two blue LEDs indicate audio on left and right channels, and a red LED flashes when over +4 dBm demodulated audio output occurs.

The front-panel headphone jack levels are controlled separately by means of a recessed trim pot. Standby mode — where the M4 outputs are muted — is accomplished by pressing and holding the Select and Down buttons for five seconds. The florescent display indicates Standby mode.

A lockout of front-panel controls is accomplished by pressing and holding the Select and Mode Service buttons for five seconds. The audio still flows, and the display toggles between a "Front Panel Locked" message and the normal text messages.

AM and FM antenna inputs are 75 ohm F connectors in the rear panel. Should the user wish to defeat the 45 dBf muting, press and hold the Mode Service button on power up.

We connected the M4 to a steerable roof-mounted antenna from Antenna Performance Specialties. Co-mounted on the same pole was a Belar amplified AM loop. A ChannelMaster steerable control allowed us to point the antennas easily in any compass direction.

## Product Capsule:

### DaySequerra M4 HD Radio Tuner

#### Thumbs Up

- ✓ Analog-to-digital transition
- ✓ Small 1RU size
- ✓ Easy-to-read display
- ✓ Set-and-forget controls
- ✓ Audio level control by software
- ✓ Bright LED indicators

#### Thumbs Down

- ✓ Muting defeat feature requires holding button on power up; awkward when rack-mounted
- ✓ Can't retune until M4 has completed getting MC data; about five seconds
- ✓ Soft functions are not intuitive; manual needed as reference

PRICE: \$1,595

CONTACT: DaySequerra in New Jersey at (856) 719-9900 or visit [www.daysequerra.com](http://www.daysequerra.com).



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The M4 is best for set-and-forget monitoring. The controls and display are not suited to casual DXing and are too obscure for a program director to "check out the competition." The display is not wide enough to see an entire text field without scrolling. The M4 has no remote control, so one assumes users would purchase an M4 for their main analog/HD Radio service, and additional M4s for each of their multicast program services.

In that context, the soft controls, functions and even the annoying screwdriver trim pot for headphone level make sense.

The Audio Muting, essential for just messing around with the M4, is difficult to disengage because the feature is controlled by pressing the front-panel Mode Service button while turning on the power — and the power switch is on the rear panel. Once disengaged, it was easy to acquire a station, and turn the antenna until the analog noise was minimized.

The VCD display showed "HD" almost immediately, and in about five seconds the HD Locked indicator lit up. The transition from analog to digital is smooth, and the Forcing feature showed the handful of HD Radio stations that had time-aligned their analog and main digital signal quite well.

In listening to stations that multicast, the audio transition from primary HD service to HD2 is quick and seamless. Unfortunately, I could not find any active HD3 services. Also unfortunately, one cannot toggle quickly between HD, HD2 and HD3; after pressing the Mode Service button, the display shows the M4 insists on "Getting MC data" and does not allow channel or program service changes until the process completes.

The company says it will make a firmware change in the fall release to permit the user to interrupt the "Getting MC Data" process and re-tune.

Additionally, DaySequerra says it will debut the M.2, a remote control version of the M4, at the NAB Radio Show in September.

Rich Rarey is the Master Control audio engineering supervisor for National Public Radio. 🌐

PRODUCT EVALUATION

# SPL Automatically Gets the Ess Out

*The Model 9629 De-Esser 'Makes Decisions' About RMS Levels, S-Frequencies, Phase*

by Greg M. Savoldi

It's a classic dilemma: Stage sequencing in voice processing generally puts the de-esser ahead of the compressor. The rub is, with widely varying source levels, the de-esser is driven too heavily or not enough. "Live mic" situations and multiple talent using the same mic (DJs on a radio station control room mic) present this problem, and while you could actively adjust the drive depth by several methods, none are efficient or practical.

SPL has a solution in a 1 RU package: the model 9629 auto-dynamic De-Esser. It handles two independent line-level channels, each adjustable for automatic or manual operation.

The "manual" operation is as expected. Just dial in the depth of de-ess you need (the 20 dB segmented display shows the amount of action). What's missing? A corner frequency set knob. SPL took the approach of "less is more" by replacing a standard knob-type tuning pot with a two-position switch labeled Female and Male. Female is cornered around 6 kHz, while Male is closer to 8 kHz.

Utilizing the Auto mode for de-essing action in the 9629 is the hallmark of this machine and what sets it apart. On-board circuitry makes intelligent decisions on RMS levels, S-frequencies and phase relationships.

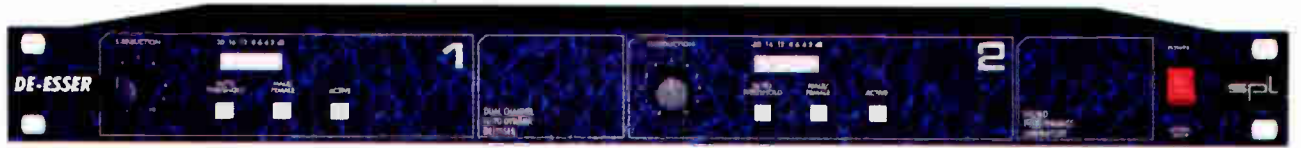
The de-ess bandwidth is set so narrowly around the range of the sibilance that adjacent frequencies remain unaffected. Audio processed via this frequency band is mixed back into the main signal phase-inverted so that only the S-sounds are cancelled where the S-reduction controller determines the intensity of the phase-cancelled mix. Once you've set a target S-reduction depth (a simple one-knob adjust), the 9629 will dynamically maintain that relative amount of activity, regardless of varying input levels.

Note, this action does not affect the overall throughput level. It's not a compressor or leveling/AGC device. Other than smoothly controlling that top end, the audio is practically left untouched at the output.

While the Male/Female switch is handy, I found running in the Male setting worked well for most applications. With an "aver-

source to source, the amount of de-essing stayed within a few dB of my set point, even though input levels increased toward 10 dB. If input levels dropped below my G/R window set point, the box simply passed the audio with no processing effect.

The specifications for construction,



A real-world application would be a live venue, whereby different speakers or vocalists use the same mic. This could be a church service, talent show, control room jock mic or a remote broadcast.

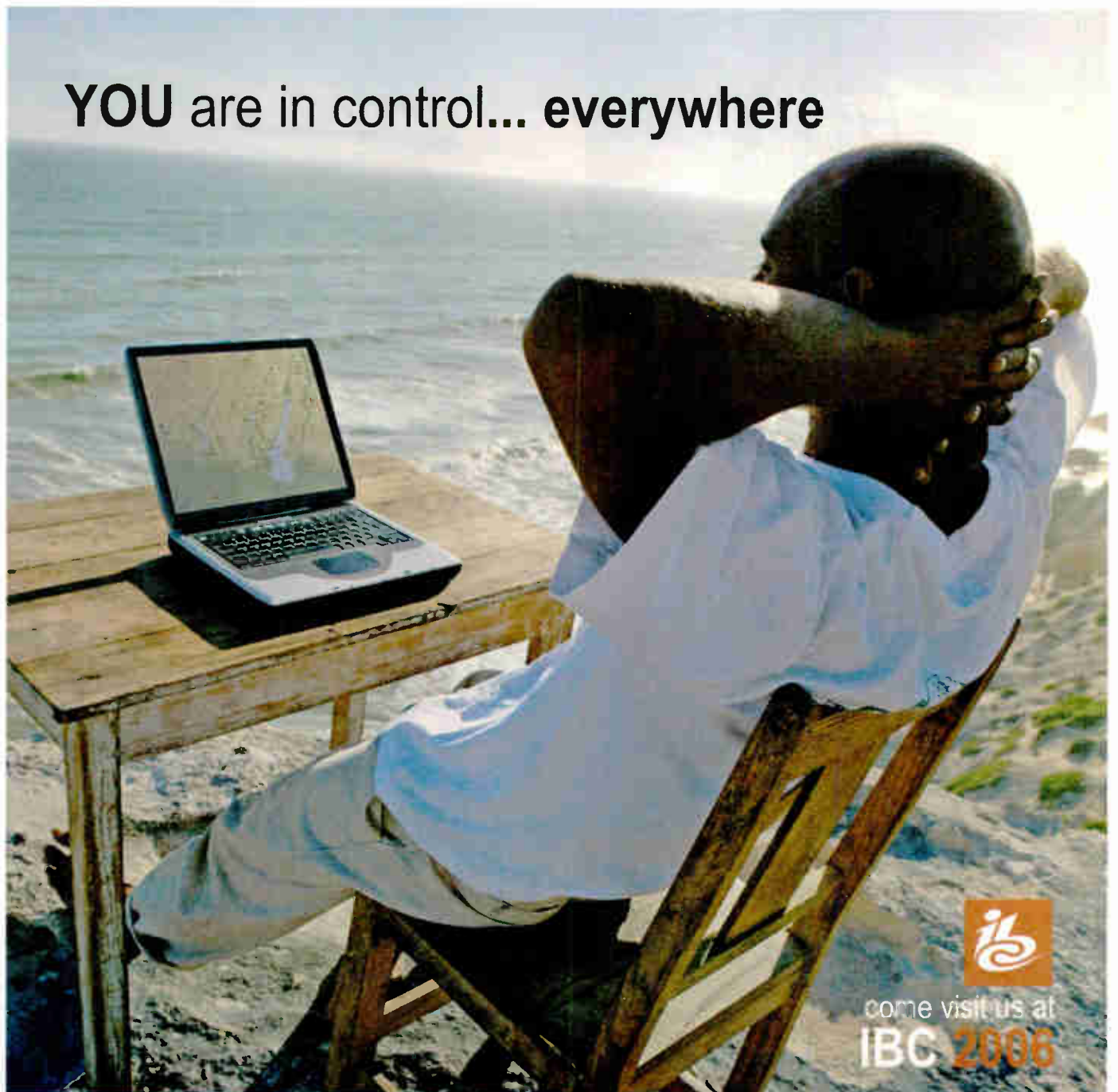
age" level coming into the 9629, I set the G/R knob for 3 to 5 dB of S-reduction activity. I then engaged the Auto mode and let the box do the rest.

As levels varied (increased) from

layout and practical features are excellent. Both XLR and 1/4-inch TRS jack sets are standard, and hard-wire bypass is a feature I've always liked. If you've ever

See SPL, page 39 ▶

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### Product Capsule: SPL Auto-Dynamic De-Esser

#### Thumbs Up

- ✓ High-quality unit for vocal processing, S-reduction control
- ✓ Auto mode
- ✓ Two-position Male/Female switch
- ✓ XLR and 1/4-inch TRS jack sets standard
- ✓ Hard-wire bypass feature

#### Thumbs Down


- ✓ Suggested rescaling of the G/R LED segment metering

PRICE: \$799 MSRP

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## NEWS MAKER

# Out of the Box: Audio Legend Bob Heil

*Microphone Guru and Rock Hall Honoree Says Performance, Quality Don't Depend on Cost*

Bob Heil is a musician, inventor, listener and innovator of products and processes. He's the kind of guy who might be inducted into a museum to mark his accomplishments.

On June 8, in fact, Heil's long career in pro audio was commemorated with a permanent display of his creations at Cleveland's Rock and Roll Hall of Fame and Museum. Centered on Heil's contributions to live sound audio in the 1970s, the exhibit tells the story of a store owner, organist and ham radio enthusiast-turned-amplifier repairman who received a phone call from Jerry Garcia, whose band, the Grateful Dead, desperately needed a PA for a show at St. Louis' Fox Theatre.

Heil impressed Garcia and the rest of the Dead. Things grew. Calling his business Heil Sound, the storeowner progressed to design and build gear for the Who (a quadraphonic mixing console for 1974's *Quadrophenia* Tour), Joe Walsh and Peter Frampton (Heil's own invention, the Talk Box), and numerous other artists.

Today, Heil is still building. He's focused on the development of comparatively inexpensive microphones designed and assembled in his Illinois factory. Heil microphones have found a foothold in radio and have a reputation for offering pleasing, natural-sounding articulation on vocals and instruments without the necessity of equalization.

To Heil, eliminating extraneous processing and relying purely on sound sources and complimentary microphones is a key component to great-sounding recordings and live performances.

In a recent conversation with writer Strother Bullins for *Radio World* and *Pro Audio Review* magazine, Heil shared his opinions on the industry in which he operates.

**Q:** In your opinion, what differentiates Heil Sound from other microphone manufacturers?

**Heil:** In the microphone world, we haven't had anything new in 30 years. It's just the same old dynamic crap. Nobody has done anything new lately. Oh, yeah — they moved their plants to China and Mexico (laughs).

But we're still building our microphones here in Illinois. Sure, parts come from all over the world, but we finally assemble them here and listen to each and every one we make.

An important part of the business — concerning quality and the way we did things in the 1970s — is lost, except for us. We've never lost that. We've carried that philosophy through our years in the speaker business as well as with mixers, power amps and a lot of the things that are going into the Rock and Roll Hall of Fame. ...

It's really pleasing to have an artist come to us and say, "Wow, this is the sound we've been looking for. Where's it been?" Well, quality keeps deteriorating because American manufacturers keep moving factories offshore. They don't care. We care.

**Q:** Do the manufacturing trends you

describe make it harder or easier for your company to market and sell microphones?

**Heil:** Oh, [they] make it much easier. Once the public hears something that sounds really good, it's like, "Oh, wow! You did that without a bunch of boxes?" Yes, it's very simple and it works.



Heil is pictured with the exhibit at its dedication at the Rock and Roll Hall of Fame. Items include a Mavis mixer built for Pete Townshend and the Who's *Quadrophenia* tour, as well as Townshend's guitar and Roger Daltrey's microphone, still wrapped in red gaffer's tape to prevent it from being launched into the crowd.

The challenge is getting them to listen and think outside of the box because it seems like everyone wants to buy a certain brand name. Well, wait a minute — there are better things out there. So what if you haven't heard of it? Just listen to it! Once they listen to our microphones, they'll never go back.

**Q:** Today, more and more new recordists are building small, capable DAW-based recording rigs, but most of them are doing so with limited funds. How are you attempting to reach those buyers?

**Heil:** They're the ones we're doing this for. We're building \$200 microphones that blow away \$1,000 microphones, and it's really helping new artists because they don't have to spend all that much money.

The pros may look at our microphones and say, "How can this \$200 thing outperform this \$1,000 thing?" But we've never lost a shootout. Never. Ever. And we won't because our microphones outperform those other choices. The quality of a microphone is not about how much it costs. Joe Walsh and I knew that.

**Q:** What did Walsh, a rock musician, have to do with the entrance of Heil microphones into the realm of pro audio?

**Heil:** Several years ago, he invited me to do this — it was all his doing. For 25 years, I had been making microphones for amateur radio, a very niche market. We own it; there's no one else there, just Heil Sound.

But that's communications-quality audio — not hi-fi, not live sound. It's very pointed and narrow-banded so it

cuts through noise. If we're saving lives in an ambulance, we want to understand the words. We've learned how to do that very well. No other manufacturer understands articulation like we do. They want you to do that with equalization. We don't have equalizers in an ambulance, thank you. So decades ago, we had to learn how to build articulation into the microphone.

A few years ago, Joe — a big ham radio operator — told me, "I think you

need to build me a microphone for the stage. Wouldn't that be neat to have your sound, but only wideband?" So he and I began working together. I'd give something to him, he'd listen to it, play with it on stage and in the studio, and he'd come back with suggestions.

We finally broke the barrier and that's why everyone is going nuts for Heil microphones. They sound gorgeous.

They have this huge wideband — wider than anything else does. It's from 28 cycles to 18 kHz, but the mics have beautiful articulation — I call it "a bouquet of speech."

So why doesn't everyone else have it? They don't give a damn. They're riding around on golf carts while they move their plants to Mexico and China. The bean counters are happy because they're charging way too much. But we come flying in here, and we are waking up the industry. It's really cool because we're helping all the new guys, and — for instance — at the same time, I just sold a bunch of stuff to NBC Television this morning. They're freaking out. They are saving tens of thousands of dollars on something that just works better.

The reason why it works is because I listen. I listen intently. I'm out in the trucks with them. I know what the problems are. I can come back in here and make it happen. The big boys can't. They have too many boards of directors. I'm just me. But boy, can't my people at the plant and I make things happen quickly.

**Q:** What's so different about the technology used in Heil microphones?

**Heil:** When Joe invited me to build some of these microphones for the stage, he said to me, "You know Bob, the bigger things are, the better they sound." He was standing next to one of his seven-foot transmitters. He said it tongue-in-cheek, but I thought, "You know, he's right."

I started experimenting. The first microphone I built for him had a diaphragm with a huge diameter. Everything out there has a smaller diaphragm, but the diaphragm in the PR-30 is an inch and a half. It's huge.

We had to really work at it, though. We had to worry about the dampening of something that big, so we used different materials in the voice coil. My microphones are loaded with new technologies, and therefore new sounds — natural sounds. We quilted it, perforated it, put humbucking coils on it and did lots of things that no one else is doing. But the whole time we were just having fun with it. I finally gave it to Joe, and he said, "Wow, it sounds great. It sounds like a ribbon. And it's dynamic."

We play with what we build, and we don't look at it on an analyzer. You don't buy a microphone to look at it on a scope, so I don't care about spec sheets. I care about how it sounds through my [JBL] 4410s.

**Q:** How has this technology you describe ultimately helped recording musicians, engineers and producers?

**Heil:** The fewer gadgets you go through, the better you will sound. You don't need all those boxes if you have the proper microphone to start with, a transparent piece of gear for the job at hand. With just about every microphone out

**'We play with what we build, and we don't look at it on an analyzer. You don't buy a microphone to look at it on a scope, so I don't care about spec sheets.'**

there, you have to EQ the crap out of it to get it to sound good. Live sound engineers will call me up and ask, "What am I doing wrong? I use your microphones, but I have to turn off the EQ?" Well, yeah. What's the problem?

I've been out on the road a lot with Tool. It's just amazing how loud they are. Yet, with our microphones, it's amazing how clean they are. They couldn't do that before, ever. So again, we're proving to a whole new world of users just how fabulous audio can be without a lot of "digi-wigs" in the signal chain.

I recently worked with a couple of really hot producers — Joe Barresi is one of them. It was amazing to me to watch him. He didn't have many "digi-wigs."

See HEIL, page 39 ►

## PRODUCT EVALUATION

# Audition 2.0 Features Analysis Tools

by Timothy Kimble

I've been a user of Audition since the days when it was available only by Web with a tiered access-unlocking fee. At that time it was a decent, albeit limited editing program. My complicated sound features frequently had to be produced on SAWPlus32.

A decade or so later, I found myself in the position of having to make a decision on a new digital editor to use in conjunction with a digital storage and automation system. The company that made SAW had since decided to drop the product and could no longer provide support. On the advice of an employee, I revisited Cool Edit, which was at that point being sold to Adobe.

After getting up and running with Adobe Audition 1.5, I quickly made the program my editor of choice. At that time, I was producing a 30-minute cultural arts show that was usually sound rich, with music and natural ambience. The concept of the show before launch was that it would be live with produced features, but with Audition it was just so much easier to have the hosts cut continuity breaks, and plop all the sound files into place.

The upgrade to version 2.0 is significant. The look of the program is much different, but the same features remain, with some notable additions. Users will notice that the initial interface is redesigned, right down to the color. All parts of the interface are sizable and hide-able. Faders are now featured prominently and can be automated, a process that required enveloping on earlier versions. Producers can nab the tool they need to use, and make it the main feature in the view.

The view I use the most, the multitrack view, will be much more familiar to established users of Audition. The familiar tracks are there, available for viewing in the recorded format (mono, stereo, video). The tracks can be moved around, or deleted in a non-destructive manner.

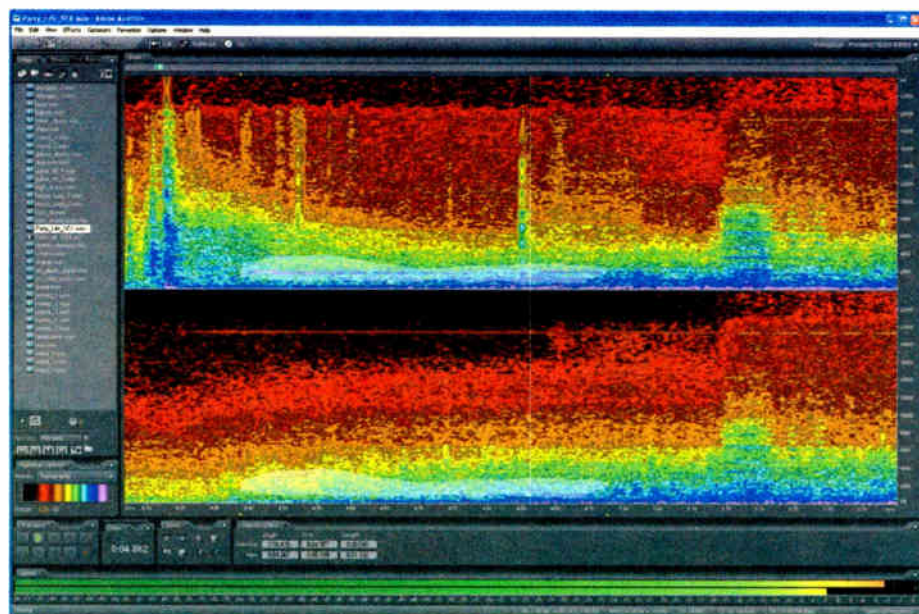
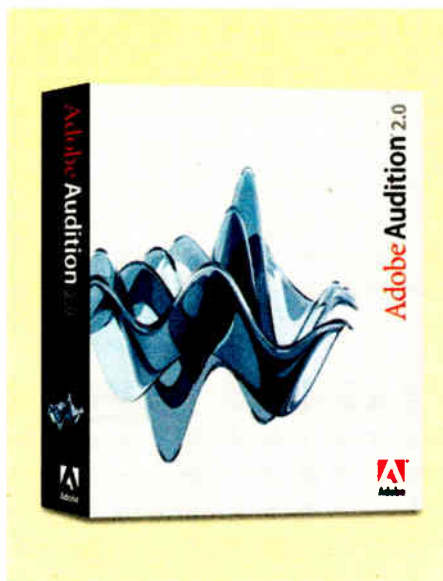
Fading and panning remain easy; a quick grab of the top line on a WAV allows you to fade it by dragging it down, and then back up in an opposite manner. Panning is accomplished by grabbing the

middle line and moving it in the direction you wish to pan. This can now be automated, with the automation view showing those same familiar node envelopes that you see on the top of waveforms in other views. The difference is that the pan and volume automation changes are shown on their own, in conjunction with other tracks showing the WAV file and multitrack view.

## Lasso, scrubbing functions

This new version of Audition has many more diagnostic tools for troublesome audio. The biggest help is the lasso function.

For producers that work with field recordings, electronic noises always show up. If there is a cable involved or a mic, there will be pops, hisses or other



With the lasso tool, users can see the aberrations in the Spectral Frequency view.

aberrations. Previously, the easiest way to handle these kinds of problems was to isolate the pop or rumble in the edit view down to the absolute briefest moments possible, and cut out that period of time. That ability was part of the amazing new world of digital editing.

With the lasso tool, you can actually see the aberrations visually in the Spectral Frequency view. You can use an

auto shape, or freehand a lasso around the audio, click on Repair Transient and it deletes that content while retaining all other audio continuity.

Another diagnostic tool that has been improved is the phase analysis. In editing several different independent producers, you're likely to receive some audio projects that are out of phase. Audition 2.0 can help remedy that situation with an X-

## Product Capsule: Adobe Audition 2.0

### Thumbs Up

- ✓ Lasso tool
- ✓ Improved phase analysis
- ✓ Easier automation

### Thumbs Down

- ✓ CD burning slower than most consumer programs

PRICE: \$349; upgrade \$129

CONTACT: Adobe Systems in California at (888) 724-4508 or visit [www.adobe.com](http://www.adobe.com).

Y display that allows the user to view phase over time and frequency.

While previous versions of Audition have allowed users to divine if audio is out of phase, this tool improves on the previous version by depicting a much more accurate display of phase. Audio that is out of phase can be corrected by using the center channel extractor, or if stereo is not required, double pasting left over right in the edit view.

Scrubbing is also added, a tool that's been on the minds of every producer who started out with tape. Users can scrub at the speed you move your mouse, and recreate that rocking action formerly reserved for the arena of grease pencils and chop blocks.

Adobe introduced CD mastering with the last version of Audition, and continues to offer that feature on 2.0. Audition's CD mastering is Red Book, CDDA standard, which at one point meant it was endorsed by Sony/Philips and should be playable on any CD player. This is different from standard software-based CD burners, which generally follow the Orange Book standard. I don't know if there are still a number of players in use that can't play Orange Book CDs, but it's a much quicker burning process.

As more music labels include copy protection that violates the Red Book standard, I would assume manufacturers want to make machines that play all CDs. If a producer is going to use the audio strictly in house, and time is of the essence, burning the CD with freeware takes much less time. The CDDA standard featured on Audition 2.0 is much more reliable for archiving or distribution.

Finding audio files is made much easier by a new system called Adobe Bridge. Audio files are grouped together and can be previewed before opening. The feature relies on XMP metadata to make files instantly recognizable and give much more info than a regular Windows file view screen.

Part of my initial reluctance to use Audition was my addiction to my previous editing program. With these latest additions and an overall appearance upgrade, Audition 2.0 allows an editing environment comfortable to users of almost any other editing suite. New analysis tools will allow audio to be manipulated easier than ever.

Timothy Kimble is technical producer for WMAL(AM) in Washington.

## PRODUCT GUIDE

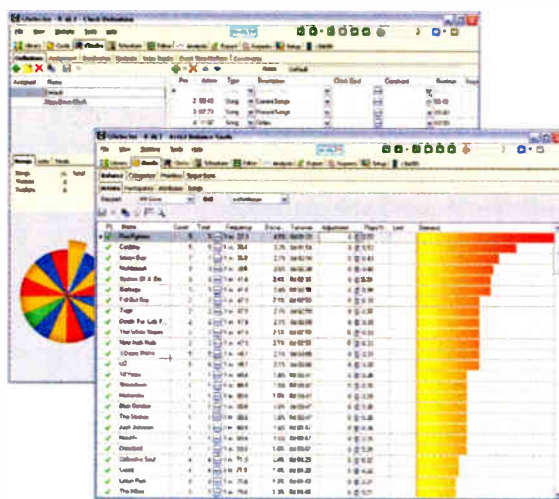
## GSelector Helps Multicasters Monitor Formats

The GSelector music scheduling system from RCS lets users dynamically see in real time the natural demand of each song, artist or attribute such as tempo, theme or sound code. Adjustments can be made on the graphic display where the resulting changes can be viewed.

The company says GSelector is suitable for stations managing multiple channels. "GSelector users can handle all their channels from one shared music library," said RCS President Philippe Generali. "Radio itself is so popular it's now available from multiple media: HD (DAB) channels, satellite services, Internet streams and FM and AM terrestrial radio stations." GSelector, he said, will help multichannel programmers keep closer control on formats.

Features include cross-channel protection to identify and adjust music schedules across a group of stations so none of them plays songs simultaneously. Each song's audio can be accessed and auditioned through GSelector as well. GSelector is Web-ready so users can schedule or make programming changes over the Internet and hear the results on the air. The system is available by barter to U.S. radio stations.

For more information, including pricing, contact RCS in New York at (914) 428-4600 or visit [www.rcsworks.com](http://www.rcsworks.com).



GSelector adjusts song attribute goals, such as artist, for desired rotation.

# Heil

► Continued from page 37

He turned all that crap off when he used our microphones. He got sounds by setting them in different places, aiming the cabinets in different formations, and doing things different acoustically and physically. When he had a microphone with our articulation and that wide, wide frequency range, it really happened.

To watch Joe work — to view his craft — was great. He's using my PR-20s, PR-30s and PR-40s. Now he can really hear a bass drum thunder. It's a huge boom he gets from the PR-40, and that's all he's using. No EQ. That's one less box, and guess what? That's also one less link to phase distortion. Get rid of that and the phase distortion goes away.

I'll see people with 31-band graphic EQ, and I think, "Why?" If you have to have 31-bands of EQ, you have huge problems. Every band of those filters is a potential phasing problem. Tie them all together and you have a sound resembling a wah-wah pedal. Use a parametric to clean up just a few points. But if you have more than a few points, then you better fix the problem.

We're having a lot of fun re-training these guys. They learn fast when they plug one of our mics into a board without any EQ.

The deal is that you can't fix acoustical problems with electronics. You just can't solve problems like bad speakers, bad speaker placement, bad speaker stacking, bad amplifier chains, bad microphones or bad mic placement that way. It all starts at the microphone. All those problems can't be repaired with an electronic fix. And that's why Joe asked me to do this. He thought it was time. He was right.

*Strother Bullins is a North Carolina-based freelance writer specializing in the pro audio, music and entertainment industries.*

# SPL

► Continued from page 35

had to lean over into the back of a dark rack, or pull a box halfway out, you'll appreciate the silk-screening on the back and top rear of the 9629 because it's printed right-side-up and upside-down. I thought this was a nice touch.

My only recommendation is a rescaling of the G/R LED segment metering. Past 4 dB of G/R, the scaling goes in 2 dB or 3 dB increments, out to 20 dB. With the Auto feature being the preferred mode of operation, you really don't need or want to be any "deeper" than 10 dB. Past 8 dB of G/R, you start "hearing" the box work, so I'd like to see the G/R segments in 1 dB increments to 8 dB G/R, then 2 dB steps out to 14 dB G/R. If you're trying to dial in more than this, de-essing isn't the processing you need.

*Greg Savoldi is regional director of engineering for Clear Channel Columbus.*

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## PRODUCT GUIDE

### FlexRoute IP Suite Features DVB-IP Technology

International Datacasting Corp. says it released its FlexRoute IP Pro Audio Suite for the implementation of next-generation professional radio broadcast networks. The suite is based on the company's FlexRoute digital audio product line, and features SuperFlex DVB Internet Protocol technology for open standards, Multiple Channel Per Carrier operation, and IP LAN connectivity and applications, as well as conditional access and encryption options.

IDC's FlexRoute IP Pro Audio Suite offers coding rates and compression standards that include MPEG Layer 2, MPEG Layer 3, MPEG 4 AAC and apt-X. The line is HD Radio-ready, with metadata, RDS, Program-Associated Data and IP connectivity.

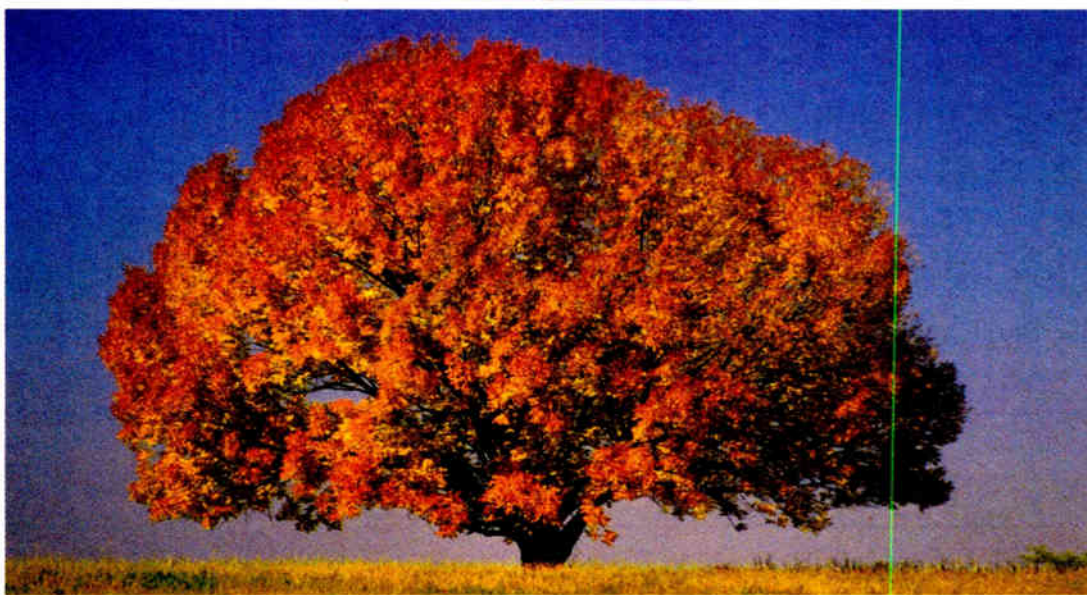
The system offers full bit-rate agility capable of operating at DVB carrier speeds selectable from 128 kbps to 45 kbps, which the company says is suitable for dedicated standalone systems as well as shared networks with other DVB services.

IDC also has a line of interoperable and interchangeable SuperFlex DVB satellite receivers as part of the FlexRoute IP suite. Current products in use for the implementation of digital audio networks include the SR2000plus Edge Receiver for background music, and the SFX2100 multimedia server appliance for hybrid Store and Forward with live streaming to a LAN.

*For more information, contact International Datacasting at (613) 596-4120 or visit [www.intldata.ca](http://www.intldata.ca).*



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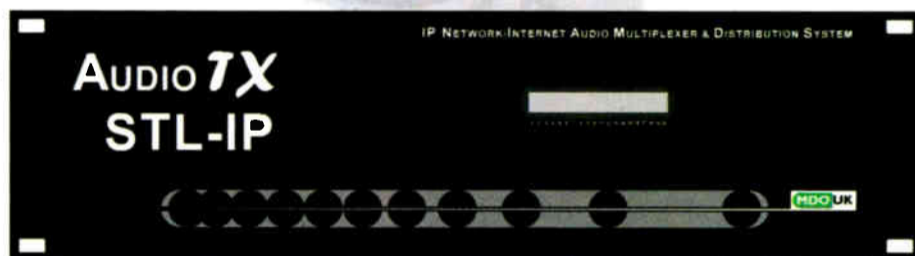
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# Buyer's Guide

Tech  
Updates  
Inside



Radio World

Codecs and Telco

August 2, 2006

USER REPORT

## Clear Channel Goes IP in St. Louis

*Over Verizon EVDO Network, Cluster Taps Tieline Codec for Remotes*

by **Christian Vang**  
Chief Engineer  
Clear Channel St. Louis

**ST. LOUIS** Sometimes finding new technology to improve the products our radio operations use can be like going to the dentist. At times the visit is painful and we walk away regretting the root canal we just endured. However, there are many times we leave the office with a smile on our faces and a sense of pride that we came away with something accomplished.

The latter example is the case with a recent demo of the **Tieline** Commander G3 codec we tried at Clear Channel St. Louis.

In February our engineering team decided to embark on a mission to find an IP-based technology that would work for our remote broadcasts. Among the various engineers and remote technicians in the St. Louis group, we tried several boxes from different manufacturers. We were beginning to lose hope that we'd find a box that would sound good, have reasonable delay and be reliable on the air, easy to use and flexible for future improvements.

for a codec.

The first time out with the Tieline was a simple experience for everyone involved. For lack of a better phrase, the codec just worked. The delay was low enough for phone calls and it sounded great on the air via the wireless IP connection. There was very little "glitching," even when the connection on the other boxes had dropped out before.

The remote technician came back to the studio that morning thrilled he didn't have to pull out a laptop to see what was going on with the codec. Every test that followed carried the same result.

We found the feature set of the G3 to be complete. For our engineers, we prefer fewer features that work simply and work well. The things our techs found most useful were the abilities to use a "profile" to reset the settings of the



Christian Vang and the Commander G3

slots on the unit. This is a great thing for those of us who are mounting these units in vehicles or sending them out for "one off" remotes where shore power isn't assured.

The front-panel display is concise without being cumbersome. The language of the menu is easy enough for an intern with no experience to figure out in the field, yet keeps the real "power settings" buried deep enough to protect them from being changed. Engineers can set a password to keep the system locked up, which would be great at clubs and other permanent locations. The status displays are easy to understand.

The Tieline is a great solution for us because it works with a variety of transmission media and sounds great on the air without conflicting with the HD Radio algorithm.

For more information, contact Tieline Technology in Indianapolis at (888) 211-6989 or visit [www.tieline.com](http://www.tieline.com).

**The system runs on 12 volts DC, so it can be powered from a wall-wart, cigarette lighter or even a battery that slides into one of the module slots on the unit.**

The last codec we tried measured up to our challenges and reassured us that IP audio codecs are the future. While a couple of the boxes we experimented with performed well when connected to a wired broadband connection, the Tieline performed well when used over the Verizon EVDO network available in St. Louis.

### Can you hear me now?

To perform our tests we ran each codec through the Verizon Broadband EVDO network via a Kyocera KR-1 router at various remote locations. On occasion we returned to that location to see if the experience was a fluke.

Typically, we took each codec out with one of our more demanding morning shows. In most cases, it was "Tony Scott and the New Breakfast Crew" on KMJM(FM). The show interacts with live telephone calls, takes musical guests on a whim and uses a new location every week. To us, this was a perfect "proving ground"

entire unit, have multiple modules in the unit at once (to utilize different types of connections,) and use a battery pack to power the unit.

We found the "Profiles" feature of the unit to be useful. At the touch of one button, the tech can reset the unit for IP, POTS or any other configuration. Also, once the button is pressed, the unit automatically can dial up the studio using the settings within the profile. The studio unit adjusts its settings to the remote unit with no input from the operator. The use of multiple modules eliminates the need to have several boxes in the studio as well. The G3 can use any two modules at once, and even fail-over if one connection drops.

Another feature that caught our attention was the ability to use a battery pack to power the unit. The system runs on 12 volts DC, so it can be powered from a wall-wart, cigarette lighter or even a battery that slides into one of the module

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## USER REPORT

# Access Racks Frequent Flyer Miles

*Comrex Codec With BRIC Technology Aids in Germany-to-New York Airplane Remote at 37,000 Feet*

by Mike Worrall  
 Technical Coordinator  
 "Travel Today with Peter Greenberg"

**LOS ANGELES** In my position, I'm responsible for ensuring that a high-quality signal path exists for each week's show, regardless of where in the world the program originates from. Peter Greenberg, travel editor for NBC's "Today Show," travels over 400,000 thousand miles a year, and "Travel Today" originates from a different location almost every week, often from foreign countries.

We generally rely on (almost) universally available ISDN technology to provide the program connection, but there was one elusive hurdle that until recently we couldn't overcome: the ability to do the show while traveling on a commercial airline flight. Given his hectic schedule, Peter has often mused about being able to do his show from the air.

This dream became a reality earlier this year, with a live broadcast of "Travel Today" from a Lufthansa flight between Frankfurt and New York thanks in large part to the Comrex Access IP codec, as reported in RW's June 7 issue.

## BRIC-lined path

The Access uses what Comrex has dubbed "BRIC Technology" — Broadcast Reliable Internet Codec — that allows it to successfully mitigate the minefield of getting real-time audio across the public Internet with very low delay.

Shipped with three standard BRIC coding algorithms (with two AAC coding options), Access' data rate is highly configurable, allowing the user to balance audio quality and path delay. This coding configuration also is independent on the send and receive paths, allowing a high-quality "send" signal, and a lower-quality, low-delay "return" feed. Similarly,

one might configure Access to transmit a stereo signal, while returning mono.

We used the Access Rack, a 1 RU chrome and silver chassis with built-in AC power supply. The initial setup of the Access requires the



Mike Worrall makes good use of his carry-on, the Comrex Access (under laptop).

connection of a video monitor and keyboard to the rear connectors. Though not required in all cases, this setup procedure allows for enabling static IP addresses, configuring contact closures and the available Aux data port.

Audio connections are made via XLR connectors, and include line-level analog left/right, in/out, plus AES EBU in/out. The uncomplicated front-panel display includes in/out, left/right LED metering strings plus a status LED that doubles as

an IP address "helper." Additional connections include an Ethernet jack, an RJ-11 POTS jack, an RS-232 serial port plus two USB connectors.

Once configured to communicate on an IP network, simply launch a Web



will begin streaming in about one second.

I found that the Statistics tab not only useful but instructive. This is where one quickly realizes that we aren't in telco-land anymore. This page brings new words into the lexicon of the remote engineer; here you'll find indications of frame loss, jitter and buffer delay. Essentially all of this is an indication of the quality of the network/IP connection, and it is presented in a multicolored, "moving graph" display that is, if nothing else, intriguing to watch.

As the graph scrolls past, you're presented with continually updated information on transmit and receive data rates, percentage of lost packets, buffer delay time and other items that quickly let you deduce the quality and status of the connection.

There's also an Audio Metering page that presents transmit and receive VU, sliding scale with peak hold and waveform displays. Each can be turned on or off, and the "speed" with which the meters react can be changed to suit. The downside is that the metering function consumes bandwidth, and may therefore be appropriate only on high-bandwidth, tightly controlled networks.

Last, the Settings tab is where one selects the coding algorithm, and is especially useful in that the associated graphics allow the user to immediately see what impact (in terms of quality, frequency response and delay) each selection will have.

In the end, it's the performance that counts. Our airplane remote was from one of the most challenging locations possible: flying at 600 mph, 37,000 feet above the north Atlantic, connected via satellite then passed on to DSL. There were virtually no dropouts or other audio anomalies during the 2.5-hour broadcast. Also, the delay over this path was so short (we calculated about 1.25 seconds), that live phone calls were incorporated into the broadcast with only a hint of "stutter delay."

For more information, contact Comrex in Massachusetts at (978) 784-1776 or visit [www.comrex.com](http://www.comrex.com).

# WPLA Gives Rio the Panhandle Test

*APT's WorldNet Rio Codecs Enabled Station To Switch from ISDN To T1 for Syndication*

by Richard Clemons  
 Chief Engineer  
 WPLA(FM), WOIK(FM) and  
 WFKS(FM)

**JACKSONVILLE, Fla.** In today's world, businesses need to pay attention to their bottom line — and radio stations are no exception. If one aspect of an operation is proving costly, it makes sense to look for an alternative.

This was the situation facing Clear Channel when its Florida-based modern rock station WPLA(FM) Planet Radio was given the task of nationally syndicating a morning show from its studios in Jacksonville. To facilitate this, audio and relay closures needed to be sent back and forth between Jacksonville and Clear Channel's satellite uplink in Orlando.

We started out by using conventional ISDN connections, but at five hours a day

minimum, this was proving expensive. We already had a Harrison system and our first thought was to acquire another. However, that would have involved adding more outboard equipment as well as codecs and what we really wanted was something more cost-effective than ISDN that could do everything in one box.

I contacted our equipment vendor to see what the alternatives might be, and after researching the problem, the company suggested APT's WorldNet Rio audio codec.

## Audio round-trip

The full-duplex, two-channel, multi-algorithm audio codec offers Enhanced apt-X, Standard apt-X and optional MPEG Layer II, and is designed to deliver high-quality audio for interstudio networking, remote/outside broadcasts and STL applications.

WorldNet Rio uses permanent digital links such as X21, V35, E1/T1, fractional E1/T1, satellite or microwave. It also has features such as analog or AES/EBU inputs and outputs, simultaneous analog and AES/EBU outputs, contact closure for sending remote control signals within the compressed bit stream, silence detec-



tion and optional SNMP for remote monitoring. The MPEG compression option enables compatibility with connections to third-party codecs.

We didn't have time to trail the units so we just went ahead and ordered two because they sounded ideal for our

requirements. The fact that they were significantly cheaper than other options, and would potentially save us money on long-distance ISDN charges, helped us make this decision. We figured if they didn't work, we'd just send them back.

The WorldNet Rios were installed at either end of a T1 circuit provided by ITC DeltaComm. My staff and I ran a series of tests for one week, which allowed us to identify and solve any teething problems.

As part of our testing procedure I linked them together and they worked the first time. I was impressed by the simplicity of the units — they are basically modular, with a separate power supply, T1 interface and codec board, which is

See APT, page 43 ►

# APT

► Continued from page 42

great from a maintenance point of view because it's so easy to get at everything.

The initial tests revealed some issues communicating bi-directionally between Jacksonville and Orlando; this turned out to be a problem with the telephone company and not with the codecs.

When we eventually started using the Rios on the morning program, we lost connectivity between Orlando and Jacksonville, which meant we were only able to send audio and relay closures one way. Again, this was a problem with the T1 line, not the codecs, so we carried on using the Rios to send audio and closures in one direction until line repairs were complete because they were still saving us the cost of long distance ISDN connections.



Richard Clemons appreciates the WorldNet Rio's multiple algorithms, AES/EBU inputs and outputs, and MPEG compression option.

WPLA's experience with APT WorldNet Rios came to an end a few weeks later when Clear Channel made a commercial decision to switch the syndicated morning show to Dallas. The Rios then moved with the show; they are still being used by engineers there, who report no problems with bi-directional connectivity over their T1 line.

My overriding impression of APT's WorldNet Rio codecs is that they are capable of sending high-quality audio both ways over a partial T1 or full T1 link. This is due to the company's Enhanced apt-X compression technology, which is key to the unit's performance.

Enhanced apt-X delivers high-quality, lossless audio with negligible coding delay, and offers resilience to the effects of cascading. It also is scalable in terms of sampling frequency and word depth; for example, 576 kbps will deliver stereo at 48 kHz and a word depth of 24-bit.

The fact that the units are cost-effective means that there should be room in most radio station budgets to invest in a spare. One other point that impressed me was the willingness of APT staff to engage in dialogue with us, particularly when we were trying to solve our initial problem with the T1 link. They were attentive and gave us helpful suggestions, which is the kind of after-sales service broadcasters need when trying to find a solution to a problem, even when it's not the product manufacturer's fault.

The APT WorldNet Rio codec retails for \$4,150.

For more information, contact APT in New Jersey at (800) 955-APT-X (2789) or visit [www.aptx.com](http://www.aptx.com).

## TECH UPDATE

### RIU-IP Server Sends, Receives Data Through Web

JK Audio debuted the RIU-IP, a remote control interface to the company's Innkeeper 2 and Innkeeper 4 digital hybrids. RIU-IP contains a Web server that allows the user to send and receive control data through their Web browser. It can be connected to the user's computer NIC card for direct control, to a switch or hub for network control, or to an Ethernet port with Internet access.

Remote control capabilities include indication of incoming ring per line; taking phone line off-hook or on-hook; confirmation of off-hook on on-hook transition per line; dialing; setting auto-answer and ring count; adjusting transmit and receive level per line; and address book upload and download.

Features include an RJ-45 Ethernet port and RS-232 remote control port with ASCII protocol. No external power is required.

The RIU-IP retails for \$345.

For more information, contact JK Audio in Illinois at (800) 552-8346 or visit [www.jkaudio.com](http://www.jkaudio.com).



# AUDIO OVER IP



## Applications

- STL links over IP networks
- Distribution of live or shared programming
- Multicasting
- Remote broadcasting over IP networks
- Automatic fallback to ISDN

## Communication Interface

- 10/100 Base-T interface
- ISDN U or S/T
- X21

## Coding algorithms

- Standard and Enhanced apt-X™, G711, G722
- MPEG1/2 LAYER II, MPEG1/2 LAYER III
- MPEG 2/4 AAC LC, MPEG4 AAC LD (Low Delay)
- PCM Linear Uncompressed Audio Over IP



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## USER REPORT

# Patapsco Bridges Gap Between Codecs, IP

*PacketBand ISDN Lets Codecs Connect to an IP Network and 'Dial' Connections to One Another*

by Rolf Taylor  
Product Manager, Telos Systems  
Freelance Telecom/Datacom  
Consultant

**CLEVELAND** As a codec expert, I've answered many questions over the years. One that has come up consistently is, "Can I use my codec with an IP network?"

My answer has been twofold. First, I caution against using IP networks that are not specifically designed to guarantee quality of service. And second I ask if the user needs to be able to communicate with the tens of thousands of codecs around the world that are on ISDN. If so, I had always maintained that there is no IP service available that allows connection between these two worlds.

Therefore, I was excited to learn of a new technology, PacketBand, which offers just this ability.

PacketBand technology is the development of Patapsco Communications. Its PacketBand ISDN can connect a number of ISDN devices to an IP network so they can "dial" connections between each other. To me, the most impressive feature is that this equipment also can be used to connect the IP network to ISDN, therefore establishing the long sought after "missing link."

My first concern was about ISDN compatibility. Experience has shown that connecting codecs to PBXs could be problematic. If the "D" channel signaling isn't compatible with popular codecs, then the rest of the technology isn't important. With this in mind, I did some investigating, and learned that Patapsco has a strong background in ISDN. In fact, it is a supplier of ISDN protocols to other manufacturers.

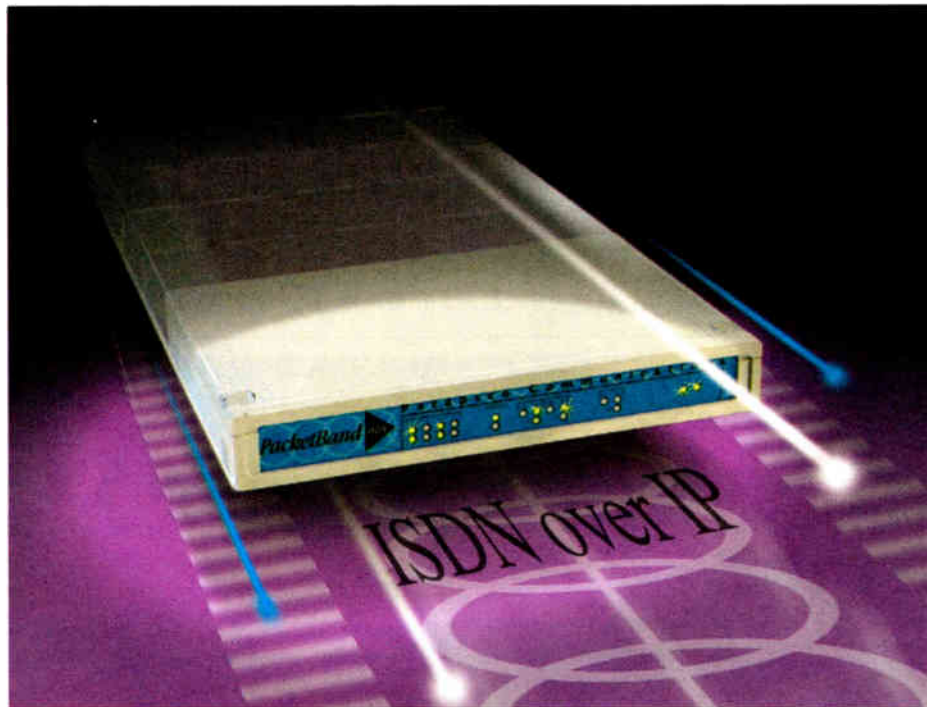
I contacted Patapsco to arrange for ISDN testing with the original Telos Zephyr and the newer Zephyr Xstream codecs. We were able to confirm full ISDN compatibility with the Patapsco equipment. Not only were the codecs able to establish "ISDN calls" over the IP network, but they also were able to lock and pass audio. We did additional testing, and as expected, the reliability of the audio stream is dependent on the IP network used, but generally works very well.

## IP network considerations

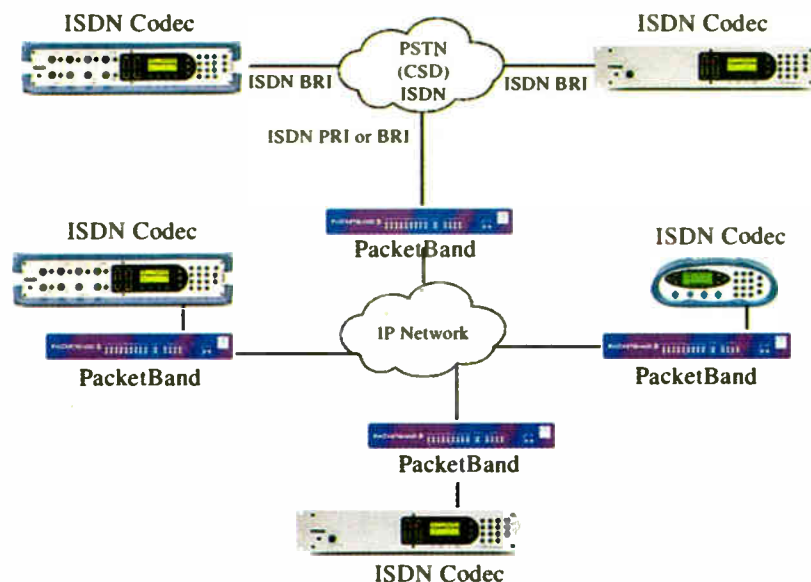
Getting back to my earlier comment about using codecs on IP networks. IP is capable of reliable audio transport; however, it is important to distinguish between the technology and the specifics of any given network. Indeed, the most famous use of IP is the Internet, a loosely assembled network of networks.

Transporting audio over the public Internet is indeed risky, because it involves multiple points where bandwidth is shared. The premise is that it is better for each user to get a slower data rate through shared portions of the Net, than for a user to get no connectivity at all. This "best effort" strategy is extremely effective when the bulk of traffic consists of transient bursts of data, which is typical of most uses. In this case, the average per-user demand is rather low.

However, with streaming audio the case



Providers worldwide are now offering private network services. Intended primarily for building wide-area networks, they are targeted as a replacement for Frame Relay.



By converting the corporate WAN to MPLS, it can now handle intra-corporate codec traffic using PacketBand. POPs to the circuit switched cloud allow on-net users to communicate with ISDN users.

is quite different; the user needs a continuous stream of data for minutes or hours. Eventually, other traffic on shared links may peak to exceed all bandwidth on that link. In these circumstances, the typical user simply notices a "slowing," but the streaming user may experience dropouts.

The vexing part of this situation is that such links may work just fine for hours, days or months, but such testing does not preclude the possibility of dropouts unexpectedly in the future, since bandwidth is shared.

There is good news. Network providers are aware of the opportunities available in applications such as telephony and streaming audio/video. In particular, there is a race to deploy reliable telephone services over IP (VoIP), and the network characteristics required to do so are the same as for high-quality audio transport. These applications require a controlled network with a prioritization mechanism. VoIP and other special IP packets can be given special treatment while other data gets treated in the usual way.

Most providers are using Multi-Protocol-Label-Switching (MPLS) technology.

There are generally at least three levels of prioritization with a guaranteed packet loss, delay and jitter for each class of service (the rate available at each level is subject to negotiation, and the user must be sure not to exceed the appropriate rate).

The MPLS network, while shared, is designed with redundancy and is traffic engineered to ensure capacity is available. The customer's data never leaves the provider's managed network, so this is not like the Internet. Such networks are engineered and managed in a similar way to a telephone network.

When used over such a network, PacketBand ISDN equipment can provide performance on a par with the traditional ISDN Circuit Switched Data network, albeit with a somewhat higher delay.

## Features, applications

One feature I liked is the Ethernet switch, which allows the PacketBand

device to be connected directly to the IP router, with the rest of the network connecting to it. Thus the Patapsco box has the ability to give priority to the PacketBand data, thereby preventing overutilization of that link.

Configuration of the unit is by way of an easy-to-use graphical application called DB Manager that runs on a PC. It offers both Starter and Expert modes so that advanced features do not confuse the typical user.

PacketBand also offers a number of extra facilities. For example, its conversion feature allows the creation of inter-continental voice networks. It also offers sophisticated routing options, and configuration flexibility in terms of packet size, buffer size and clock algorithms.

**The Ethernet switch allows the PacketBand device to be connected directly to the IP router, with the rest of the network connecting to it.**

The PacketBand ISDN equipment does its job well, but cannot, on its own, fully serve the typical remote broadcast remote usually handled by POT or ISDN codecs. The typical IP link at a remote site connects to the Internet, and hence while such connections might work, there are no guarantees.

For these situations, error concealment, adaptive buffering and other techniques are able to reduce the odds of audible dropouts. However such techniques require that packetization be controlled by the encoder, and hence are not amenable to agnostic packetization by PacketBand. Therefore, for these cases specialized native IP codecs are best.

The enterprise level is where I see the PacketBand ISDN gear really paying off for radio groups. Imagine a corporate user such as the BBC or Clear Channel which has upgraded its WAN to an MPLS-based network. ISDN codecs are removed from dedicated ISDN BRI lines, and placed on PacketBand ISDN, resulting in substantial savings on monthly recurring charges. Intra-corporate connections are now handled over the WAN, reducing long distance charges too.

Finally, communication to outside the company is achieved by providing an ISDN PRI service connected to PacketBand at a few locations. Aggregating use at these sites can help negotiate the best prices for dial tone and long distance access.

The PacketBand gear comes in several versions, depending on the number of ISDN ports required.

For more information, including pricing, contact Patapsco's U.S. distributor Promptus Inc. at (401) 683-6100 or visit [www.promptus.com](http://www.promptus.com).

## TECH UPDATES

## PortaNet Sends, Receives IP Through Ethernet

ATA Audio's PortaNet is a portable, IP and ISDN full-duplex, two-channel, multi-algorithm codec. It is based on the company's ProntoNet IP and ISDN dual audio codec.

PortaNet simultaneously sends and receives via IP through its Ethernet port (10/100 Base-TX), and connects to ISDN



codecs through its I-BRI terminal adapter, which supports U and S/T interfaces and the following ISDN protocols: EISDN, AT5ESS, DMS100 and NAT1.

Features include four XLR balanced mic inputs that are switchable for mic, line and 48 V phantom power and have independent level control; channel assignment buttons (main and talkback) for each input; input level indicator for program channel; limiter after program mixer input; and three 6.35 mm jack headphone outputs with independent channel and level controls.

The PortaNet retails for \$3,900.

For more information, contact ATA Audio in New Jersey at (973) 659-0555 or visit [www.ataaudio.com](http://www.ataaudio.com).

## FJ-700 Suitable For Cell Phone Remotes

The FJ-700 four-channel cell phone mixer from Conex Electro-Systems works with most cell phones or with a landline phone. Each input channel has a switch-selectable mic- or line-level input; each mixer input has a balanced XLR connector and a 1/4-inch unbalanced input for stereo or mono sources.



Features include separate adjustments for cell and landline send and receive levels; four separate 1/4-inch headphone channels with separate volume controls; and separate source selection switches for the Host headphone and three Guest headphones. Switches allow for monitoring phone send or receive audio, and external audio such as an off-air receiver. The Host channel also can be used as a cue channel for two of the inputs.

The FJ-700 retails for \$498.

For more information, contact Conex Electro-Systems in Washington state at (800) 645-1061 or visit [www.conex-electro.com](http://www.conex-electro.com).

## Broadcast Tools' TT-1 Interfaces With Podcast Mixers

Broadcast Tools' TT-1 is a rack-mountable, compact auto-answer and auto-disconnect hybrid/coupler powered by the phone line. It uses dual-hybrid transformers for full-duplex audio. The company recently added mini jacks to the unit that enable interfacing with small podcast mixers.

Additional features include a rear-panel multi-turn hybrid null trimmer to allow the user to achieve approximately 20 dB separation figures; front-panel line seize button; call drop button; auto-answer/monitor-TAP switch and audio mute switch. Off-hook and ring indicators are included.

A rear-panel RJ-11 enables connection to a POTS line along with a second RJ-11 loop-through jack that may be configured to disconnect attached devices when the TT-1 goes off-hook.

For more information, including pricing, contact Broadcast Tools in Washington state at (360) 854-9559 or visit [www.broadcasttools.com](http://www.broadcasttools.com).



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## USER REPORT

# Xstream, WSUI Meet For Morning Java

*University Station Uses the Telos Zephyr Xstream For AM Remotes From Local Coffee House*

by Jim Davies  
Chief Engineer  
KSUI(FM), WSUI(AM)  
Iowa University

**IOWA CITY, Iowa** The University of Iowa's 100,000-watt KSUI(FM) and 5,000-watt WSUI(AM) serve the eastern third of Iowa. When I first arrived at WSUI, the director had this idea of doing a Friday morning talk show with new music and live interviews from a local coffee house, The Java House. The station wanted the best quality audio it could get and I immediately turned to ISDN.

when we can.

Also produced is a show from the Iowa City Public Library called "The Big Brain," about twice a month. It's very phone-interactive and is transmitted over the Zephyr Xstream. That show uses the remotely controlled TWOx12 Talkshow System while a guy at the studio screens the calls. The Iowa City Library installed their own ISDN line — and provided rolls for us in the morning to entice us to come in.

There are some times when we use our Zephyr Xport portable codec to connect to the Xstream, for newsgathering or when an ISDN line isn't present (it uses a



musicians perform Friday mornings on Iowa Public Radio's Talk of Iowa Live from The Java House. Since 2001, the coffee house has been the venue for the weekly broadcast, which features live music. Here, members of The Mike and Amy Finders Band perform; host Ben Kieffer is seated at the board.

I had been introduced to the Telos Systems Zephyr Xstream while working as an engineer for 25 years at WMT (AM/FM) in Cedar Rapids. It is my box when using ISDN, so when I was approached to make up a shopping list, the Xstream with mixer was on it.

We set up the Java House weekly remote. The feed originates after we get our minivan unloaded with the PA, mixers, mics and Xstream. After we get the ISDN hooked up and dial in our SPIDS, we transmit at 64/48 kbps in stereo to the Xstream back at the studio. The AAC works well for us from The Java House. The Zephyr Xstream sounds nice even when passing through additional layers of coding.

The Java House show goes across the state to a bunch of stations under one umbrella: WOI(AM), KWOI(FM) and KTPR(FM), giving us coverage to the western half of Iowa. We have the intention of covering the whole state and would do so, but we're missing a couple of key transmitters in certain locations to give us entire coverage. Our Xstreams are pretty busy; at different times during the week we get requests to book time on the studio Xstream to be used by various NPR and BBC shows.

We find it is in our interest to be a conduit for University of Iowa researchers and artists to gain national recognition

(POTS line). The Xport box is easy to use. One of our Xports resides with our news guy, who is on the other side of the state. He has some technical chops, but finds that it's a great news tool. He transmits his audio from the Xport on a POTS line back to our studio on the Xstream, and I think the aacPlus sounds really good.

There have been a couple of times when we couldn't get to a room with ISDN, or have gone to a place where the on-campus phone guys couldn't get us ISDN. We've gotten to a point, twice now, where we've used the IP feature of the Zephyr Xstream codec, and these productions have worked well.

We upgraded our Xstream with the latest software for using the IP feature of the Zephyr Xstream, and chose the five-second buffer, spent a little time on the test bench making sure it would work and set up for a show. The remote came out perfectly and worked great — an hour-long show with no problems.

One of the things I appreciate about the Telos products is that once you have TCP/IP available, you call across the Internet, pick up the updates and you're off.

Programming from WSUI can be heard at <http://wsui.uiowa.edu/>.

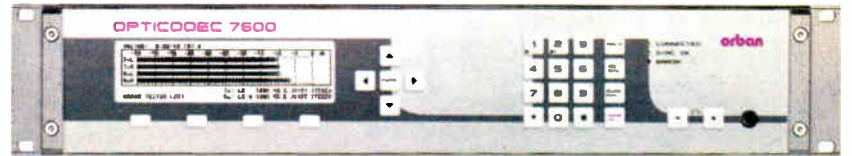
For more information, contact Telos Systems in Cleveland at (216) 241-7225 or visit [www.telos-systems.com](http://www.telos-systems.com).

## TECH UPDATES

## Orban Debuts Opticodec 7600

Orban's Opticodec 7600 is a fully duplex audio codec with ISDN and Ethernet 10/100 Base-T connection for remote controls, and the ability to distribute audio over networks such as Intranet, ATM, TCP for point-to-point and point-to-multipoint connections, and UDP for broadcast and multicast modes. It uses Motorola DSP instead of PC processors.

Additionally, the 7600 has an X.21 or V.35 interface as well as optionally up to three ISDN interfaces, or it can be mixed with POTS interfaces. It features configuration and operation directly with the keypad, and a high-resolution graphics display.



Opticodec 7600

The company says the POTS interface lets users employ their analog telephone system to send a contribution. It uses aacPlus for audio quality at low bitrates.

Features include an automatic codec detect function and compatibility with AETA 4SB ADPCM, which the company says is suitable for transmitting sports events, as the delay is less than seven milliseconds.

Orban says users will appreciate the Windows 2000/XP-based NETControl remote control software, which allows monitoring, configuring and connection of Orban Opticodecs for the network.

Orban also offers the Opticodec-PC, MPEG-4 AAC/aacPlus encoding software for streaming audio. It lets streaming providers supply content encoded with the Coding Technologies AAC/HE AAC/aacPlus codec. Stations encoded with Opticodec-PC can be experienced via Real Player or Winamp 5.08, and can be listed on [tuner2.com/opticodec.net](http://tuner2.com/opticodec.net), a directory service for Opticodec streams.

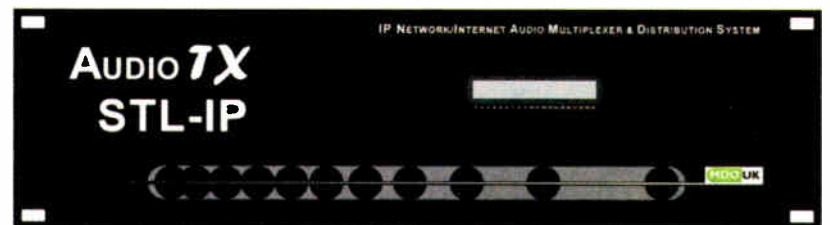
Opticodec-PC is available in three versions: LE, SE and PE. Opticodec-PC LE and SE are compatible with most sound cards. The LE encodes a single stream at bit rates between 8 and 32 kbps, while SE simultaneously encodes four streams at bit rates from 8 to 320 kbps.

For more information, contact Orban in Arizona at (480) 403-8300 or visit [www.orban.com](http://www.orban.com).

## MDOUK Adds to STL-IP Series

MDOUK says the latest additions to its AudioTX STL-IP line, the STL-IP-16 and the STL-IP-8, are large-scale IP Audio multiplexer and audio distribution systems with up to 16 inputs and outputs per 3 RU unit. They can send and receive live audio over IP networks with a 5 ms delay.

These can be used in applications where one or more central locations act as a hub and send-receive mono/stereo transmission or program feeds to multiple remote sites. The IP multiplexers also can be used to send and receive large numbers of audio channels directly between two or more sites.



MDOUK STL-IP-16

The Synchro-Lock facility allows transmission of 5.1 or 7.1 surround audio, or in other applications where each audio channel need to retain sample-level accurate synchronization with other channels. Audio can be sent and received in linear (uncompressed) mode or using coding algorithms including MPEG Layer 2 and Layer 3, J.41, ADPCM and G.722.

STL-IP-16 and STL-IP-8 are available with professional, balanced analog or AES digital inputs and outputs presented on XLR connectors. Network connectivity is provided via a 10/100/1000 mbps Ethernet connection, which can accept a standard RJ-45 connector or industrial-type Neutrik Ethercon connector.

MDOUK also has STL-IP Connect software, which is designed for Windows 2000 and XP. It enables live audio from 30 kbps and studio-quality audio from 64 kbps. Reporters can include pre-recorded clips of audio during a live report using a playlist function. The STL-IP Connect software retails for \$1,400.

The retail price of the AudioTX STL-IP is \$2,800. Contact the company for pricing of the STL-IP-16 and 8 units, as the price varies depending on configuration and number of in/outputs.

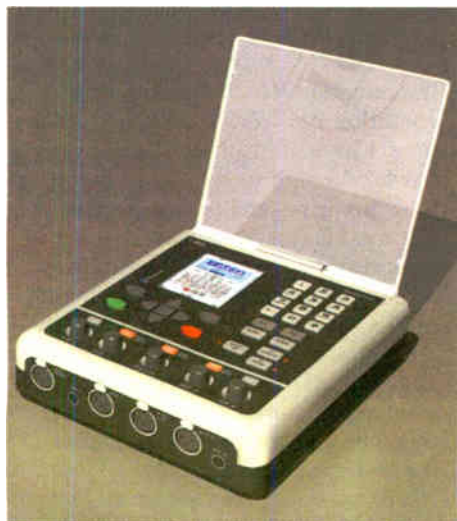
For more information, contact MDOUK at [mo@mdouk.com](mailto:mo@mdouk.com).

TECH UPDATES

## AEQ Phoenix Has Wireless, Standard, ISDN Lines

AEQ debuted the Phoenix portable codec with multiple telecommunication modes such as wireless, standard telephone and ISDN lines. It features an adjustable audio mixer, a set of auxiliary and headphone outputs, a color screen to display a menu-based browsing system and a control system for the unit.

The Phoenix can be used as a desktop unit or in "shoulder strap" mode. It may be operated from fixed positions as a permanent station link or in a commentator position, or as a link unit in mobile environments — for remote broadcast vans, motorcycle mobile units or roving reporters. It offers two independent audio outputs that can be used as backup communications outputs.



Inputs include two phantom-powered microphone inputs, one switchable mic-line input and one monaural auxiliary input. Outputs include the two headphone outputs with independent level control, and one monaural auxiliary output.

The codec can include one or two communications modules according to the user's needs. The PSTN module connects to the conventional telephone line; the GSM POTS dual-band module is for GSM communications and requires a SIM board.

The company says the Phoenix is suitable for people without technical training. Once the unit has been pre-programmed at the station for the desired type of operation, its users select the output code (GSM or PSTN) and dial the telephone number, either manually on the keypad or by using the mini-directory included.

Additional highlights include automatic gain controls, automatic acoustic echo elimination and indication of remaining battery time. The Phoenix comes with an external power feed unit and carrying case.

For more information, including pricing, contact AEQ in Florida at (800) 728-0536 or visit [www.aeqbroadcast.com](http://www.aeqbroadcast.com).

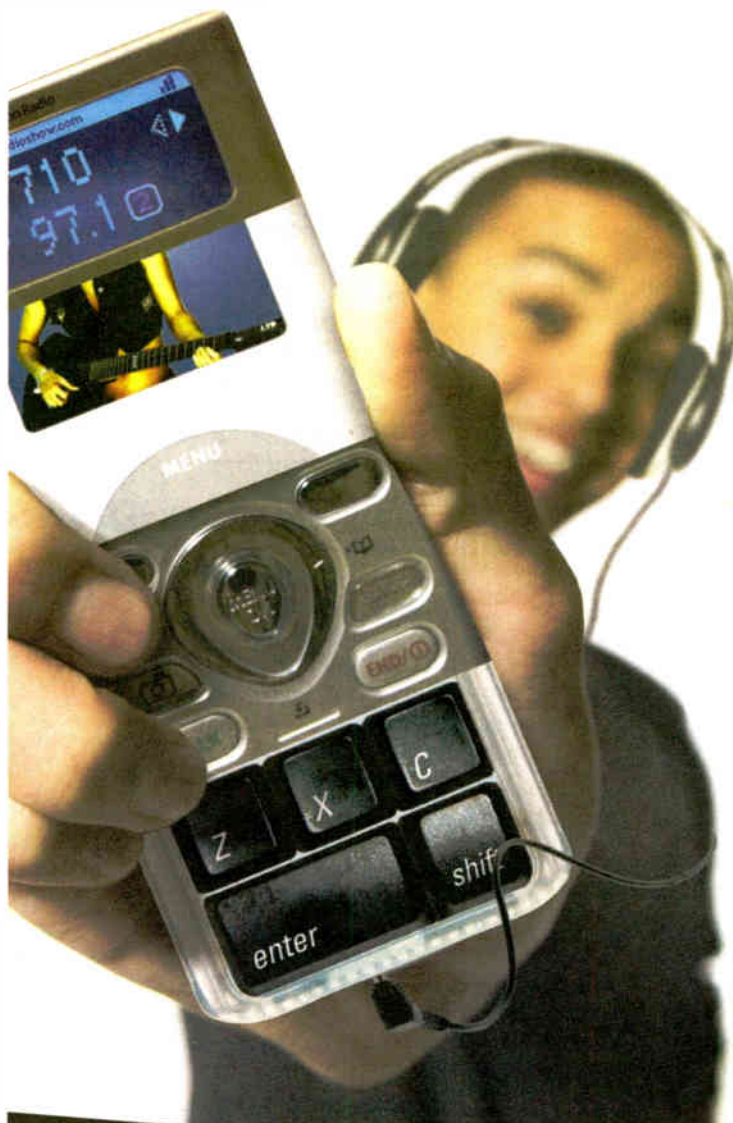
## AudioStar Sends Real-Time Audio from Remotes

Musicam USA's AudioStar is a software IP audio codec for PCs that works over LAN, WAN, DSL and ADSL and the Internet. Portable, it is suitable for remotes; it can be used on laptops and PCs equipped with a 10/100 LAN interface and a DirectSound compatible sound card.

Additionally, AudioStar can connect to another PC running AudioStar and is compatible with NetStar and RoadStar hardware codecs over IP. AudioStar has an auto-detect algorithm that recognizes the coding algorithm used in the transmission of content over an IP connection; it can then change user settings to match. It comes with a hardware dongle, a small USB hardware key required to run AudioStar unrestricted.

Users can employ the standard sound card that comes with the laptop/PC, or can purchase a professional sound card that provides the same performance as hardware codecs. The sound card in the laptop/PC must support full-duplex audio, or the ability to play and record simultaneously. AudioStar supports the standard algorithms MPEG 1 and 2 Layer 2, MPEG 2 Layer 3, and G.722. It also supports MPEG 2 and 4 AAC, MPEG 4 AAC low delay, and uncompressed PCM linear audio.

Users also can multicast content to multiple locations running AudioStar, NetStar or RoadStar hardware codecs. For more information, contact Musicam USA in New Jersey at (732) 739-5600 or visit [www.musicamusa.com](http://www.musicamusa.com).



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## USER REPORT

# Neural Enables Broadcast With Fewer Bits

*KUOW Uses the NeuStar Plus Codec Preconditioner To Enhance Audio Quality of Three HD Channels*

by **Dane Johnson**  
**Director of Operations**  
**KUOW(FM) and KXOT(FM)**

**SEATTLE** KUOW(FM) Public Radio is pretty proud of the fact that we have been a pioneer at broadcasting HD Radio at ultra-low bit rates, specifically 16 kbps on our third HD channel, for almost a year now.

I realized early on that for HD Radio to really mean something — and not just be another passing fad (remember AM stereo?) — we, the broadcasting community, needed to offer added services, or as my GM likes to say, “Super-service the audience.”

The progression of that thought was to start thinking small. The better the sound quality at a smaller bit rate, the more programming we can offer. The more programming we can offer, the more listener loyalty we can generate. By thinking small, as in the case of our 16 kbps mono channel or our tested 24 kbps stereo channel, broadcasters can not only broaden the range of in-house programming, but also open the channels to niche broadcasters who could not readily afford spectrum space.

This has the potential to make spectrum available to a broad range of programming for groups and services with an augmented data service such as a Spanish-language public radio group or even the established radio reading service. The first members of the baby boom population are entering their 60s this year. With 1.7 million adults 65+ residing in the Seattle area, older listeners seeking this type of service will

increase dramatically.

When I began the implementation of HD Radio, the idea of multiple channels was in the forefront of my plans. The HDC codec is good, but it breaks no new



Dane Johnson and KUOW's NeuStar Plus

ground. And it has most of the bit-rate limitations of codecs such as aacPlus. I realized that in order to broadcast multiple channels at lower bit rates, a good codec preconditioner was crucial to removing extraneous artifacts from the final HD broadcast.

#### Star search

In the beginning of 2004 there was one company, **Neural Audio Corp.**, that had

a suitable product: NeuStar, designed to optimize the HD codec. I found out that the company was based here in the Seattle area; I was doubly pleased to employ a company right in my backyard. Initially, we purchased a Neural NeuStar for our primary HD broadcast channel, KUOW1, and later that year we bought another for our KUOW2 channel.

and relatively intuitive, so we really didn't need any additional assistance from Neural during installation. At that time, we were running KUOW1 and KUOW2 at 48 kbps, and they sounded great.

But I really wanted to push it further. So it was only natural for me to go to Neural with the ultimate challenge: “Make my 16 kbps third channel sound great.” As a result of our collaboration, Neural was able to augment their low-bit-rate technology and develop a hardware package that became the NeuStar Plus.

KUOW(FM)'s third HD channel is running at 16 kbps mono with NeuStar Plus and is very listenable. But I think it could sound better and we have some work to do before I call the 22 kbps stereo good to go. Neural is actively involved in the process. Actually, the biggest problem we have currently is the inconsistency of the quality in our source programming, not the codec.

On the planning board for the near future is a fourth channel, KUOW4 (22 kbps stereo), so I am interested in testing Neural's new software-based preconditioner. The NeuStar SW4.0 is designed to process and pre-condition the HD2, HD3 and HD4 streams directly on the Importer. We also are looking at it to pre-condition our Web streams at the same time. I have not had a chance to fully put SW4.0 through its paces yet, but it does look promising and comprehensive.

Low-bit-rate broadcasting is a great opportunity for small broadcasters to acquire a voice for their programming. It recalls the day when you could actually request a frequency from the FCC and get one. As broadcasters, let's not be stingy with our bandwidth, and heck, we might be able to put a couple of dollars in the coffers at the same time.

For more information, including pricing, contact Neural Audio Group in Washington state at (425) 814-3200 or visit [www.neuralaudio.com](http://www.neuralaudio.com); or Harris Radio Broadcast Systems in Ohio at (513) 459-3597 or [www.broadcast.harris.com](http://www.broadcast.harris.com).

## TECH UPDATES

## Centauri II Offers FlashCast, Dual Ethernet Option

The Centauri II Audio Gateway line from **Mayah Communications** features twin/quad codec technology for simultaneous transmission to different destinations with various stream patterns, and for simultaneous encoding/decoding of quad stereo signals.

Features include FlashCast technology, and multichannel support for the transmission of 4x stereo via IP and transmission of 5.1 or 7.1 surround signals via IP or ISDN with algorithms such as MPEG-4 HE AAC.

FlashCast technology detects a remote codec algorithm by sending test patterns and/or an analyzing bit stream. The company says it recognizes more than 90 percent of encoded signals and synchronizes the correction.

The AES Transparent option allows the transmission of AES/EBU signals, each with 3.072 Mbps. Transparent means the simultaneous transmission of the 24-bit audio signals and 8-bit additional signals, which the company says is suitable for the transmission of a Dolby-E or DTS signal.

With other codecs integrated, the Session Initiation Protocol allows the establishment, control, termination and modification of point-to-point multipoint connections.

The dual Ethernet option allows Centauri II to distribute the audio-over-IP and remote control data streams over two separate logical networks. The second Ethernet card also can be used for fully redundant audio streaming.

Additional options for the Centauri II line are hot-swappable redundant power supplies and Opto In/Relay Out interface.

For more information, contact U.S. distributor **Lamar Audio** in Oklahoma at (918) 770-0941 or visit <http://lamaraudio.com>.



Centauri II 3001

## Sonifex DHY-03 Serial Control, SCi Software

Sonifex added serial control capability to its DHY-03 digital telephone hybrid. The company says it had been selling the DHY-02 DSP hybrid since 1996; customers had begun in the last few years to ask for serial remote control so it could be controlled by software-based telephony and automation systems.

“The launch of the DHY-03 [last year] provided the platform to add features including conferencing, automatic call answering and RS-232 serial control,” said Sonifex Managing Director **Marcus Brooke**.

The company provided SCi — Serial Control Interface — remote control software to control the DHY-03. It is available for free on the Sonifex Web site, and allows the user to connect to multiple hybrids serially, or via IP using a suitable converter.

The SCi software can be used to configure the hybrid so it is operating with the correct telephony settings for the country of use. A selection can be made from a list of country codes and up to six sets of user-defined disconnect tone settings can be saved.

Other interface settings available include the ability to adjust the input/output gain. Also, advanced users can directly manipulate the hybrid's telephone interface registers. New firmware, available on the Web site, can be uploaded to the DHY-03 unit using SCi as and when new features are added.

SCi can be used to dial outgoing calls via DTMF on a dial pad, answer incoming calls and drop calls. A timer displays the duration of incoming/outgoing connected calls, and there is a clock display. A phone book can be used for often-dialed numbers.

The DHY-03's feature set includes input and output metering, local/remote line hold switching, integrated auto-answer, automatic call disconnection, auto-ducking, DTMF tone regulation and a balanced mic/line input and balanced line output.

The DHY-03 retails for \$1,150.

For more information, contact **Independent Audio** in Maine at (207) 773-2424 or visit [www.independentaudio.com](http://www.independentaudio.com).





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## ◆ READER'S FORUM ◆

### The Untrained Ear

I must take exception to the derisive tone and title of Steve Lampen's article "A Vacuum-Filled Brain" (May 24). It is misplaced and not constructive. This is an obvious "straw man" for a shotgun aimed at all of "high-end audio."

It is critical to understand that while there may be a percentage of "snake oil" being touted in various markets — high-end audio being one of them — not all, not a majority, and likely not more than a small percentage of all high-end audio products are designed to mislead or prey upon gullible consumers. Most high-end manufacturers have a genuine interest in producing a superior-sounding product.

**Solid engineering is the bedrock for high-end audio. But that is not the sole criterion. If it were, there would be no differences to be had in audio equipment of any sort.**

Furthermore it costs a fair amount of money to enter this market. It's not something anyone would do on a lark.

Also, the requirements for commercial audio installations, broadcast sound, PA/SR sound, home theater and high-end audio are different. They do share many commonalities, but they are not the same in all regards.

It's fairly obvious that for a vast majority of people out there, FM stereo, cassette, 8-track tapes and AM radio, and before that Edison cylinders, were all "good enough." Let's not forget that Mr. Edison at one time did a public demonstration of his acoustical playback equipment that was adjudged at the time as being "indistinguishable" from the original. Later there was the famous demonstration by AR at Grand Central Station in NYC that proclaimed the same. Were they? Not hardly.

When CDs were first becoming popular, audiophiles complained that the "leading edge" was being lost; they were scoffed at. Turns out they were right; 14 bits were not enough. Then some people were complaining about the quality of CD "pressings." Finally some really smart person determined that there was some sort of clock jitter in a transfer process at the pressing plants.

Today the popular modes are using forms of digital compression, pretty much a step up from the popular modes of the past. But these are clearly still compromises compared to reality or high-quality SOTA recordings.

Solid engineering is the bedrock for high-end audio. But that is not the sole criterion. If it were, there would be no differences to be had in audio equipment of any sort; they'd all be identical, like

bricks or plastic molded parts. Recent peer-reviewed studies (Dr. Earl Geddes, for example) have shown audible differences in low THD/IM amplifiers, and also the ability to not hear differences between some low THD/IM amplifiers and some high(ish) THD/IM amplifiers.

In other words there is no direct correlation between typical specs and what we can perceive. The correlation is elsewhere.

That finding explains to a great extent what has been going on in high-end audio, and why there are products that appear incredulous and foolish to many. Those who have noticed the above finding or been otherwise aware have attempted in various ways to determine, control and affect this elusive factor — thus the propagation of seemingly wild audio products, including cables and wire. It ends up being an art as much as an engineering or scientific endeavor.

The success of these attempts has been highly variable, to say the least. Generally speaking there has been no scientific basis or engineering parameter(s) to manipulate that directly correlate to the quality or perception of what is being heard. Rather results are situation-specific and application-specific. And of course we're talking about wringing out the last drop of fidelity and performance.

So, regular "zip cord" is quite sufficient for many situations as a speaker cable, as is your standard import receiver. You can get 90 percent of the way without much more than that. Going beyond that point you start to find that rather miniscule and seemingly insignificant things begin to have more impact; sort of a "Princess and the Pea" effect, except that it is often quite real and evident.

Let's not condemn so quickly. The average person neither needs nor understands extremely high audio performance; the consumer doesn't need it or want it. For those who desire it and seek it in a variety of ways, engineering and science are included in the process. It reduces to an art that employs technology.

Randy "Bear" Bradley  
Hannacroix, N.Y.

### Letters to the Editor

Radio World welcomes your point of view on any topic related to the U.S. radio broadcast industry.

Letters should be 100 to 300 words long; the shorter the letter, the better chance it will be published in full. We reserve the right to edit material for space. Longer commentaries are welcome but may not reach print as quickly.

Include your name, address and contact information, as well as your job title and company if appropriate. Also include the issue date of the article to which you are responding.

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**Our readers have something to say**

**"I really enjoy the publication. Industry, technology, etc. — it keeps us up to date with the buzz, and we enjoy hearing from pros in the business."**

**John Curtis**  
Owner/Founder  
J. Curtis Communications  
Baywood Park, Calif.



Shown: Heil PR 30. Large-Diameter Dynamic With Hum-Bucking Coil and Built-in Shock Mount

## ◆ READER'S FORUM ◆

## Everybody's Got A Radio

I take issue with the last paragraph of "CEA: Analog Gives Way to Digital" (RW Online, April 6). Radio receivers aren't even mentioned. I think data would indicate that homes in the United States have more radio sets than television sets, and that they are present in more than 95 percent of them. Maybe [it's assumed] "everybody has one" so they weren't even counted.

You are doing a good job with your publication, though, and I appreciate it very much.

Roger Stubbe  
HCJB World Radio  
Colorado Springs, Colo.

## Red-Light District

Congratulations. Years of rubbing shoulders with the assorted fruits and nuts inhabiting Washington has had its effect. With your editorial on birds and towers ("Are Your Towers Green?", April 20), you are well on your way to being a full-fledged banana. A banana, as defined by Ann Applebaum of the Washington Post, is a NIMBY (Not In My Backyard) who subscribes to the theory of "Build absolutely nothing anywhere near anything."



Migrating birds frequently camp out for the night in dead trees, better for keeping a wary eye out for predators. Out on the treeless plains, what better place to roost for the night than on someone's 500-foot stick?

In every flock a few older or sick birds don't make it through the night; their bodies are found at the base of the tower the next morning. Then there are the sudden cold fronts in the fall. The sudden drop in temperatures, accompanied by freezing rain, may decimate the flock.

The theory that flocks of birds get confused by red tower lights is just bizarre. If birds were so easily confused we would see them circling around tall highway lights like moths. Even more bizarre is the theory that massive numbers of birds are killed by colliding with guy wires. They can see power lines well enough to perch on them but can't see guy wires? Yeah, right.

Printing deadlines obviously caused

you to miss the FCC's April 12 dismissal of several petitions by the enviro-crazies. They asked the commission to order a halt to all new tower construction on the Gulf Coast, alleging that large numbers of birds were dying because of collisions with towers. Based on that logic, we should ban all new picture windows, to save territorial cardinals from their own reflections.

The FCC disagreed, fortunately. Unfortunately, the commission intends to continue a separate rulemaking inquiry into this issue. We don't need to encourage them.

We already have the National Programmatic Agreement, a gift by Congress and the FCC to the hordes of 10-percenters in Washington. The NPA adds several thousand to the cost of new towers for studies nobody will read. Nothing delights the bureaucrats more than to be able to create new legal hazards for business; retire; then rake in the shekels guiding those very same businesses through the maze they just created.

I only have a short 220-foot stick in the country, a combined site. We're surrounded by birds. When I say I work with a flock of turkeys, I mean the wild ones just over the hill. At least the buzzards are not circling overhead; last time I saw them they were preoccupied with a crunched coon on Shadow Hill Road.

Massive bird kills, "killer towers," represent nothing more than the latest wave of junk science. Remember the maxim: There are lies, damn lies and statistics. Beware of bureaucrats armed with calculators.

Tom Taggart  
Co-Owner, WRRR(FM)  
St. Marys, W.Va.

I read your editorial with some amusement. It sounded like a typical screed from PETA or Sierra Club, both bastions of credibility.

I noticed a conspicuous lack of data in the article [that] would give needed information to the reader. In fact, the only figures stated were the American Bird Conservancy's ridiculous number of 50 million birds killed, which is patently false, and the figure of guyed towers killing "close to 10 times as many birds as unguyed towers" — another meaningless figure [as] we have no idea how many birds are killed to begin with.

For all we know, the figures could be one bird killed per 1,000 unguyed tower compared to eight per 1,000 on guyed towers, a death rate slightly above natural causes and largely inconsequential. But even if the 50 million figure is marginally correct, 10 times as many die from flying into glass windows and over twice as many by house cats. Where are the regulations for them?

In 30+ years working around towers from 50 feet to 2,000 feet, I have found two dead birds, and I am always looking. But what I have yet to hear in all the enviro-whacko hysteria is any mention of the avian Cuisinarts popping up faster than weeds, and soon to rival the numbers of towers. Take a stroll through a wind farm and you will find numerous dead birds of all types. Where is the great concern for bird kills from these hazards?

Maybe its because Clear Channel doesn't own any wind farms (yet). Radio

World has been largely apolitical and relatively fair and balanced, but in this instance you are far from it. As broadcasters we can no longer just play moderate defense, [and] in this situation should go on hard offense. If there are regulations proposed to impact towers regarding still largely unsubstantiated bird kills, let's make sure they first control the proven kills from wind farms before looking at us.

After all, we are broadcasters; let's put that microphone to some good use. Let's not get blamed for killing the goose when the windmill kills the gander.

Mike Vanhooser  
President, Nova Electronics  
Dallas

## IBOC Questions

I'd like to share a few random thoughts from a small college station director who is dreading the IBOC conversion process.

**The kids who do listen to radio have no problem with max-o-smash mastered music that is pumped through max-o-smash radio processing. As they evolve into more desirable demos, what makes anyone think their standards for fidelity are going to change?**

— Darren J. Morton

First, this issue has been beaten to death, but bears constant repeating: content draws listeners, not "fidelity." Every day I am surrounded by kids who think MP3s sound just fine. The ones who do listen to radio — and it is disturbing how many do not, nowadays — have no problem whatsoever with max-o-smash mastered music that is pumped through max-o-smash radio processing.

As these 18-to-22-year-olds go out into the world and evolve into more desirable demos, what makes anyone think that their standards for fidelity are going to change? If programmers want kids to listen nowadays, they need to offer them something worth listening to; not something that "sounds better." Heck, even my "golden ears" will accept the artifacts in XM just for access to commercial-free content and unique formats.

Second, as the changeover to IBOC will be mandated at some point, are the feds also going to force receiver manufacturers to include decoders in every radio sold in this country? Unless they see significant consumer demand, I can't imagine any self-respecting receiver company willingly putting the extra cost into their products. Want an example? Flip through a Crutchfield catalog and see how many companies offer radios with iPod connectivity vs. AM stereo.

Third, WSAJ(FM) airs a lot of college and high school sports. Significant latency in the broadcast signal will not play well with the fans in the stands listening in.

Shall I kill the digital carrier during games?

Fourth, WSAJ is owned by a small college and does not accept funding from outside sources. My total budget for a year is well under \$50,000, not counting my meager salary (I also serve as the campus media services director). I will probably have to sell my eternal soul to get the funds to make IBOC happen here. I would be interested to see the results from a survey of college broadcasters as to who can afford the conversion and, better yet, who is planning to do it? What about the few locally owned, small-market stations out there?

On a personal note from a grumpy 37-year-old, the concept of paying a non-government entity such as Ibiquty for the pleasure of broadcasting in digital fries my bacon. As a fan of general deregulation and capitalism, I want to know where are their competitors? Monopolies suck.

Although I have my budgeting and plan together for conversion to IBOC, I

am waiting another 18 months to two years to start the process in hopes that the whole thing will go the way of DAT, AM stereo, Betamax or Laser Disc.

Darren J. Morton  
Director of Media Services  
WSAJ Radio Director  
Grove City College  
Grove City, Pa.

## VOA Should Start Fresh

[George Woodard's] letter is smashingly on-target and free from bullfeathers ("Playa de Pals," May 10). It also fits in nicely with Kim Elliott's worthy writeup earlier in the same issue.

Nothing will happen until the existing culture of incompetence among federal elected and other officials comes to an end. Until then, keeping worthy ideas front and center, like chicken soup, can't do any harm and just might do some good.

Should that day ever come, it might be worth giving fresh consideration to one of Kim's earlier ideas: in effect, to scrap the Voice [of America] altogether and start over. His original published arguments still hold water, plus today, the upper and middle ranks at the Voice are with notable exception occupied by shameless toadies.

Lawrence Magne  
Penn's Park, Pa.

## ◆ READER'S FORUM ◆

### The Road Chosen'

In his article "Has Anyone Thought This Through?" (April 20), my neighbor Jack Hannold decries the interference WRDW(FM)'s IBOC signal causes to classical music on WQXR(FM) from New York City. WQXR is about 100 miles from Clayton, on the far side of Philadelphia. WQXR(FM) does not serve South Jersey, it serves New York City, Westchester County and north Jersey.

Jack did not realize that the very IBOC technology he decries provided him with not one, but two excellent classical music stations, WHYI-HD2 and WRTI-HD2 locally in Philadelphia, and without commercials to boot! There is no reason why folks in South Jersey should listen to scratchy signals from New York when there are home grown signals, in great-sounding HD.

**The interference from WSTW's IBOC is certainly no worse than the main-channel signal caused in 1958.**

— Ted Schober

Some of his other points about interference are well taken. WSTW(FM) is a grandfathered short-spaced station, which caused a lot of interference to WMMR (FM) and WYSP(FM) in the days of tube FM radios that had poor adjacent-channel selectivity. The interference from WSTW's IBOC is certainly no worse than the main-channel signal caused in 1958.

Additionally, medium-wave hybrid IBOC certainly does cause some interference problems, but after driving the IBOC signal from WTTM(AM) today after putting the hybrid signal on, it sure does make the Salsa sound good!

The FCC recognized that hybrid IBOC was a tradeoff, and it would cause increased interference. The FCC also knew that terrestrial radio would not survive with the alternative media snapping at its heels. Satellite, 802.11 radios, podcasting and high-speed cellular streaming

will compete for listeners' ears. If terrestrial radio cannot compete in sound and reliability it will not continue to flourish.

IBOC is the road chosen. Let's make the best stations we can.

*Ted Schober  
Haddon Heights, N.J.*

### From the Committee

I spotted RW's editorial (April 12) on the sessions put together by the NAB2006 Broadcast Engineering Conference Committee. I think I can speak for all committee members when I say that it was our pleasure to assist NAB in putting together a great show for 2006.

The BECC is composed of many hard-working, dedicated broadcast engineering professionals, all of whom feel that we have a duty to give back to an industry that has been good to us. We had many timely topics this year, and it was truly a struggle in some sessions to pick the best of the best.

I personally have been honored to serve on the committee several times and found the experience very rewarding. If it were not for the persons who attend NAB and the Broadcast Engineering Conference sessions, we would have no reason for being.

Thank you for your support. Now that NAB2006 has past, we hope our sessions and presentations lived up to expectations.

*Thomas R. Ray, III CPBE  
Chairman, NAB2006 BECC  
New York*

### FRS Channel 1

Regarding the RW Online article on the proposal to use Family Radio Service Channel 1 for emergency communications ("New Public Emergency Communications Network Formed," May 8): Kind of like CB Channel 9, many years ago. Sounds like a good idea, but how practical will it be overall?

Limiting factors will be range, due to power limits in the FRS band. Secondly, the frequency won't be reserved specifically for emergencies, like 121.5 MHz is in the aviation world. Therefore it is less likely to be routinely monitored, due to routine chatter. Channel 1 makes sense, as all FRS radios will have it. However Channel 1 does tend to be the default

### A Sneaking Suspicion

The first reports of interference were bizarre and unlike other cases of illegal or pirate operation. They were mobile and involved programming that, strangely, came from one of the satellite radio providers.

The source was soon identified as small radio transmitters that allow consumers to play the audio signal of "new technology" audio devices through the FM tuners of existing home and car audio systems. These small, popular devices allowed consumers to use new audio products without having to buy entire new audio systems.

Known as Part 15 transmitters after the section of the FCC Rules and Regulations that govern their operation, these devices suddenly seemed to be everywhere.

A report from the NAB in June confirms what many engineers had suspected: many of these consumer devices seem to operate with signal strengths far greater than rules allow. In fact, of 17 devices tested, only four operated within the legal limits. In one case signal strength measured was 2,000 percent above the allowable limit.

Broadcasters have a right to be upset and to ask how this situation could have developed. It was left to them to discover this interference and prove its existence. The NAB investigated with its own money, commissioning the study from an independent telecommunications consulting firm.

It's particularly galling that these illegal devices were built to support the efforts of new technologies trying to supplant traditional media, such as MP3 audio players and satellite radio receivers. Satellite in particular has marketed its services as more reliable and less prone to interference than terrestrial radio. Ironically the use of Part 15 devices to speed deployment of satellite was making this marketing hype more true than intended.

Also notable is the fact that most of these devices use frequencies in the non-commercial band. Some operated by default only at 88.1 MHz.

Action is warranted, indeed demanded. Existing stocks of these devices should be removed from retailers shelves immediately until they can be tested and receive compliance certification. Nothing can eliminate the large number of these devices that have been sold and are causing interference, but further distribution should be halted.

Additionally, manufacturers found not to be in compliance should be assessed substantial fines for violating FCC rules. Due to the stealth nature of the violation and discovery of the problem well after thousands of these devices have been distributed, these fines should be punitive. The goal is to discourage such bad behavior in the future.

Radio broadcasters operate in a challenging environment, with new competition for audience and advertisers arriving in a steady procession. New technologies should not be allowed to use licensed spectrum to disrupt and disable FM broadcasting.

— RW

channel radios power up to initially out of the box, so it also is likely to have the highest routine traffic.

This proposal, on the other hand, does provide for a "standardized" common channel that public and those responding (provided all parties are educated and the responders are equipped adequately) have to facilitate the response.

Let's use, for an example, getting lost in the woods. The search party monitors Channel 1, attempting to hail the lost party, while the "searchee" would know to use Channel 1 as the most likely to be monitored. This is likely only to be practical in a situation where the searcher and searchee have a good chance of being in range of one another, such as on foot, in an aircraft, etc. It is assumed that FRS would be but one method of communications considered, should there be others available such as a cell phone or even a whistle. Proper preparation for the activi-

ties undertaken is always vital.

It's a matter of setting public and public safety organizations' expectations and educating them in one or two simple procedures. Returning to the "lost in the woods" example, if you have an FRS radio and are unable to find your way out or are otherwise in trouble, switch to Channel 1 and call for help, giving location, situation and other details. Likewise the searchers, when presented with this scenario, would monitor Channel 1.

Additionally, it might be a good idea, should this proposal take hold, that Channel 1 have its tone-coded squelch ("privacy") function disabled, as calls from a radio with a "privacy code" enabled can be heard on a radio with an unencoded squelch; it won't work the other way around. And if one can't hear an emergency call, what good is it?

*Randy Aldous, KCOEGE  
Brainerd, Minn*

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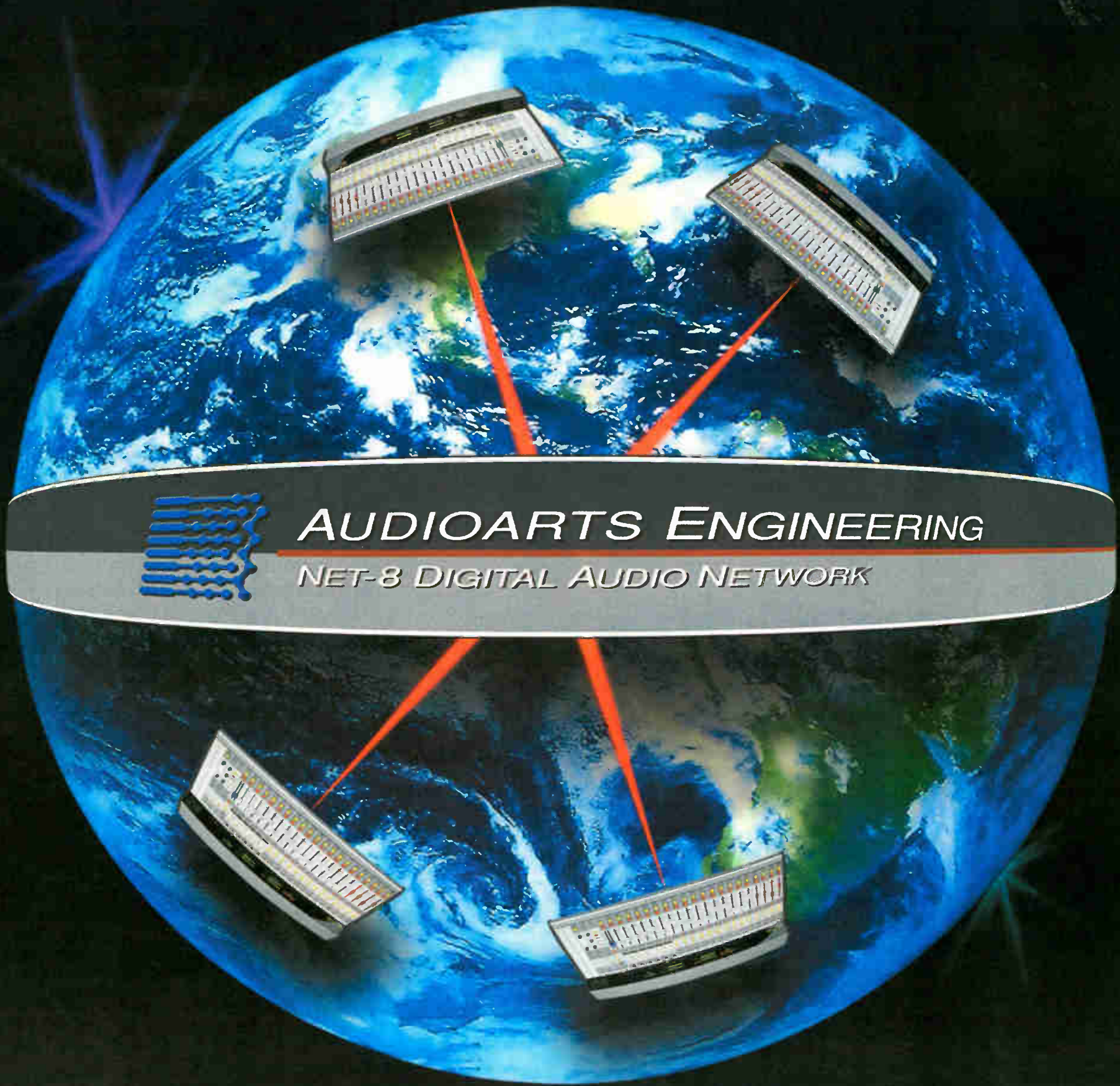
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