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Modern electronic systems can do much more than ring a bell or cause false alarms.

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$2.50 The Newspaper for Radio Managers and Engineers April 13, 2005

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▼ Bob Orban on 5 kHz AM and other matters of interest.

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Commission Eases Multi-Channel Use

by Leslie Stimson

WASHINGTON The FCC has reiterated how stations that use IBOC technology can seek permission to split their digital signals into several channels.

While falling short of a blanket authorization sought by National Public Radio, experts said the clarification is a clear public signal from the FCC that stations are free to apply for multi-channel operations as experimental licenses — quite a feat given that this was one of several broadcast items the commission staff handled before the exit of Chairman Powell in March.

NPR stations involved in the multicast effort, dubbed the Tomorrow Radio project, first sought experimental authority to split their digital signals a year ago; slowly, more have begun to do so. But project participants sought some assurance from the commission that it would not block stations from splitting digital signals, in order to provide confidence to stations and transmission and receiver manufacturers.

The clarification is important because experts believe the potential revenue to be

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Every Hour, All Day Long, WHUR Promotes HD Radio

Howard University FM Is 'Washington, D.C.'s First Digital Radio Station'

WASHINGTON *Among early adopters of HD Radio, some stations are beginning to promote digital radio; others prefer to wait until more receivers are in the market.*

Howard University's WHUR(FM), which went digital a year ago, has chosen the high-profile approach, incorporating the fact into its branding. The station, under General Manager Jim Watkins, created an audio logo that proclaims itself as "Washington, D.C.'s first digital radio station."

WHUR, at 96.3 MHz and the equivalent of 50 kW, is known for an "Adult Mix" of urban AC music. It also has added Ibiquity Digital's HD Radio logo on all of its station signage and giveaways, from apparel

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Photos by Leslie Stimson

WHUR brings its van, which is equipped to demo HD Radio, to events.

◆ NEWSWATCH ◆

Alpine to Ship HD Radio In August

COLUMBIA, Md. Alpine Electronics plans to ship its first HD Radio in August. Radio World first reported on this unit in the Feb. 16 print issue's post-CES coverage. Now more details about the HD Radio receiver are available. Alpine said the DVA-9965 aftermarket auto receiver, which incorporates an HD Radio tuner, will be available at retail in late summer.

The in-dash DVD, CD, MP3, WMA, AM/FM tuner features support for surround sound using Dolby Digital and DTS.

LPFM vs. FM Translator Fight?

WASHINGTON The FCC gave LPFM supporters a gift as former Chairman Michael Powell left the building: a freeze on accepting new FM translator applications.

The agency is trying to decide whether new LPFMs should be licensed as a primary service and potentially gain more priority over existing and future FM translators in terms of licensing and interference concerns. Public comments were due 30 days after publication in the Federal Register.

LPFMs now are licensed as a secondary service, as are FM translators. The commission is still sorting through thousands of FM translator applications resulting from the last filing window, when it was deluged with requests. LPFMs and FM translators vie for the same spectrum: right now, the translators have priority because those applications have been filed while there is no new application filing window scheduled for LPFMs.

The commission is seeking comments on ownership and technical changes to the LPFM rules. It's also asking whether LPFMs should be allowed to stay on the air where interference is predicted to occur within the 70 dBu contour of second- or third-adjacent channel full-service FMs authorized in the future.

The six-month freeze on grants of FM translator CP applications is intended to give the commission time to sort out the LPFM-related questions.

The commission made some immediate changes to the LPFM service in March. The agency expanded its definition of a "minor change" to 5.6 kilometers for LP100 licensees for LPFM stations that want to move their transmitter sites and gave the Media Bureau the ability to waive the LPFM construction period rule so that LPFM permittees can have an extra 18 months to complete station construction.

LPFM advocates sought priority over FM translators during a recent FCC hearing in which they laid out their needs to help the service grow.

Groups Allege Translator 'Trafficking'

Days before the freeze noted above, LPFM advocates asked the agency to determine whether three entities that applied for more than 4,000 FM translator licenses violated the law by selling some of those licenses to religious broadcasters.

A coalition of religious, community and media watchdog groups told the Los Angeles Times that speculators at three Idaho companies improperly made more than $800,000. The LPFM advocates want the commission to withhold the licenses.

An FCC spokeswoman told the Times the agency was aware of the concerns. The churches were not accused of wrongdoing.

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Index

Evacuate the State! Oops, Never Mind

In Connecticut, Planners Try to Ease Operation For State Workers After Incorrect Message

by Randy J. Stine

HARTFORD, Conn. Emergency management officials in Connecticut are taking steps to prevent errors involving the Emergency Alert System after a gaffe in February in which the entire state was ordered to evacuate by mistake.

State emergency management officials reportedly will adopt new test procedures and purchase additional computer software to simplify the process and reduce the chance of an error.

Connecticut did not evacuate. The incident affected radio listeners and TV viewers briefly, and had the greatest impact on cable users after an inadvertent message crawl appeared on their screens ordering the immediate evacuation of the state, according to emergency management officials.

An Office of Emergency Management employee entered the "evacuate the state" authenticator code, sources said, during a weekly internal administrative test between the state OEM and Connecticut's four Local Primary (LP1) stations. The primary stations are connected by hardwire through the phone company to OEM and state police headquarters, the only two points of entry for emergency messages, sources said.

Sources say state emergency management officials will adopt new test procedures and purchase additional computer software to simplify the process and reduce the chance of an error.

Mike Rice, president of the Connecticut Broadcasters Association, said, "The weekly internal test is a log-only function to simply test the phone lines. However, the 'evacuate the state' code was adjacent to the routine administrative test on the OEM's encoder/decoder box. It was simply a case of highlighting the wrong function and sending it."

There was no audio attached to the erroneous message, Rice said, which meant radio and television stations simply had their programming interrupted momentarily "as if it were a blown monthly EAS test," he said.

"The problem occurred with cable systems across that state that had their EAS equipment on auto pass-through to allow everything on the air. Some cable operators allowed the message to scroll for 15 to 20 minutes before realizing the mistake," Rice said.

Emergency management officials immediately issued a statement saying the evacuation notice was accidental. Radio and television stations also took to the air and "did the right thing by informing the public of the error," Rice said. "There was no wave of confusion or panic. I think it was considered to be more of a joke than anything."

The OEM logged 11 phone calls from residents who viewed the evacuation message and called to see if it was legitimate, Rice said. "I believe since it was the middle of the afternoon, TV viewership was light."

Calls to the Office of Emergency Management seeking comment were not immediately returned.

Rice said the OEM has since revised test procedures and eventually will add a computer to interface with its encoder/decoder more easily. They also will require that two state OEM employees administer all internal test procedures.

In the days following the incident, Internet broadcast engineering chat rooms buzzed with speculation that the evacuation was no accident at all. Instead, they theorized it was ordered by emergency warning officials as a "dry run" to gauge the public's reaction to such an emergency. Rice said there is no evidence that the erroneous message was anything more than a simple mistake.

Allen Leaves PPW; Group Dissolved

WASHINGTON Kenneth Allen has resigned as executive director of the Partnership for Public Warning, a Washington-based public-private group that was formed in the aftermath of 9/11 to help foster discussion on ways to improve delivery of emergency warnings.

In July 2004, Radio World reported PPW would scale back its efforts due to a lack of funds. This March, the board decided to dissolve PPW for the same reason.

Craig Fugate, chair of the PPW board said in a statement, "While there is still a vital need for public-private partnerships in this area, we expect that other organizations will step forward and build upon the work done by PPW."

Allen has accepted a position as executive director of the American Council for Technology, a non-profit group working to use information technology to improve delivery of public services. He joined PPW in late 2002.

The Partnership for Public Warning gave the FCC a list of recommendations to improve public waning, including a national, uniform, all-hazard risk communication warning process be implemented with a single federal entity in charge. The FCC incorporated some of those recommendations into its 2004 EAS Notice of Proposed Rulemaking.

PPW was made up of representatives from emergency management, government, broadcast engineering and private business. It was founded in 2002 with start-up money from Mitre Corp. PPW received additional funding from the Federal Emergency Management Agency.

Randy J. Stine

Paul McLane Named Editor in Chief, Radio World/U.S.

Paul McLane has been promoted to Editor in Chief of Radio World's U.S. publications by IMAS Publishing (USA) Inc. The announcement was made by Publisher Carmel King.

"This reflects growth at IMAS that has occurred over several years, the most recent of which is the addition of our Radio World Engineering Extra," King said.

The Radio World/U.S. family serves engineers, owners and managers of U.S. broadcast radio stations.

"Paul now is responsible not just for the editorial content of 26 issues of Radio World, a position he continues to hold," King said, "but also six annual issues of the new Engineering Extra, overseeing and working with new Technical Editor Michael LeClair; plus the content of RW Online; our weekly RW Newsbytes e-mail newsletter; and the annual RW Sourcebook & Directory.

"Paul also contributes substantially to several special supplements and other IMAS projects including The NAB Daily News, and has hosted in our series of online Webinars."

McLane joined IMAS in 1996 as managing editor of Radio World and was promoted to editor in 1998. He oversees several editors and a large pool of freelance columnists and writers producing more than 1,000 articles and news items a year.

"I hear from readers all the time that there has never been a more exciting technical time to be in radio, thanks to digital, multi-channel and the onset of new media," McLane said. "It's gratifying to see these trends played out in the pages of Radio World and our related offerings."

McLane's background is unique in the radio broadcast trade industry; he has experience both as a trained, award-winning journalist, and as a sales and marketing executive for radio broadcast equipment suppliers. He also has edited three books and is active as an actor in Washington's professional theater community.

Looking for the Next Big Thing

From the Editor

Paul J. McLane

I wrote last time about the health of the broadcast supply industry. That led me to thinking about startups.

If you were going to start a business, would you go into broadcast equipment manufacturing?

I can see you shaking your head. After all, you might reason, the supply industry has shrunk, based on anecdotal evidence and the size of the Radio Hall at the spring NAB. Companies have gone by the wayside, been bought up or moved into other fields much faster than new ones have entered our market. Dealers complain of ever-slimmer margins. It's a tough business.

Ah yes. Remember when any given NAB show would produce a number of fledgling companies, each run by an engineer with a dream, literally working out of a garage and walking the floor at the show with a gizmo under his arm? Frank Foti, Dan Braverman, Kyle Magrill, Joel Bump, Peter Burk, Allen Hartle, Don Winget, Hank Landsberg — many types of companies and various degrees of success, but all cut from the same kind of technical, entrepreneurial cloth. I can probably name three dozen more; and if you've been around the industry longer than I, you'll remember others who displayed the same kind of spirit.

The brand names of today were the upstarts yesterday. And they continue to innovate. But the industry needs fresh upstarts, too.

How come we don't see new entrepreneurs at the shows like we used to? Is exhibit space simply too expensive for first-time companies? Or is it that, for much of the past decade, ours has not been a booming hardware marketplace thanks to economic forces coupled with the impact of consolidation on stations themselves? Fewer radio owners equates to fewer suppliers, is it that simple?

Thank goodness for those who ignore such received wisdom. This year's show has its share of startups and existing companies promoting new ventures.

Maybe this year's hot device will come from the guys at 25-Seven Systems with their ATM box. Or from the new joint venture of Broadcast Warehouse and TransLanTech. Or from Dave Scott, who has retired from the automation company that bears his name and is moving into the traffic business. Or from Digital Radio Express in the Armstrong booth. Perhaps one of these guys, or someone we don't know yet, will end up producing the next Optimod, Zephyr, Marti or other landmark product.

Here's hoping. You know RW will be out there hunting on your behalf. And if you hear of something worth our attention, leave me a note at the Radio World booth.

★ ★ ★

Dow Jones, an engineer and the owner of Broadcast Technical Service in Ventura, Calif., liked his first three issues of Radio World Engineering Extra. But he wrote to me with concern when he received his Feb. 23 RWEE and noticed it was labeled Vol. 29 No. 5.

Number *five*? Had he missed two issues?

No worries, Dow. Note that, following postal rules, RWEE is considered an issue of Radio World, so the No. 5 you saw simply indicates the fifth issue of the year for RW and RWEE. Thus the most recent RWEE, carrying a cover date of April 6, was No. 9 of the year overall for us and carried that number.

★ ★ ★

Our supplement "Recipe for Radio Surround," which readers received along with the March 2 Radio World, described the New Year's Eve "Toast of the Nation" broadcast on NPR, and included first-person accounts by Mike Pappas and Rich Rarey.

A supplier wrote to me with concern that our supplement might be construed as an endorsement by Radio World of that particular approach to surround for radio. While I don't think most readers would interpret the articles that way, I do want to be clear; it's not an endorsement.

The debate over how and whether to implement surround in the radio environment is an important one, and continues to be played out in our pages, as it will no doubt be at the NAB show coming up shortly.

★ ★ ★

Speaking of the show, last issue we told you about the sessions and booths of NAB. This time we help you wrap up your planning with survival tips and dining ideas; and Scott Fybush tells the story of Highway Radio, a "friend" to anyone who has driven from southern California to Las Vegas.

But perhaps the best advice for enjoying NAB comes from the great baseball player Satchel Paige, who offered the following tips for staying young. These are southern wisdom at its best. Keep them in mind as you walk the aisles or stand in the taxi line:

✓ Avoid fried meats, which angry up the blood.

✓ If your stomach disputes you, lie down and pacify it with cool thoughts.

✓ Keep the juices flowing by jangling around gently as you move.

✓ Go very light on the vices, such as carrying on in society. The social ramble ain't restful.

✓ Avoid running at all times.

✓ And don't look back. Something might be gaining on you.

Are You Reading RWEE?

When you hear "white paper," think RWEE! Radio World Engineering Extra is now four issues old, and it's been a success right out of the chute. Here's just a sampling of articles that have appeared in the first four issues:

Ron Rackley on the evaluation and improvement of AM antenna characteristics;

George Cabrera of Harris on the math of split-level combining;

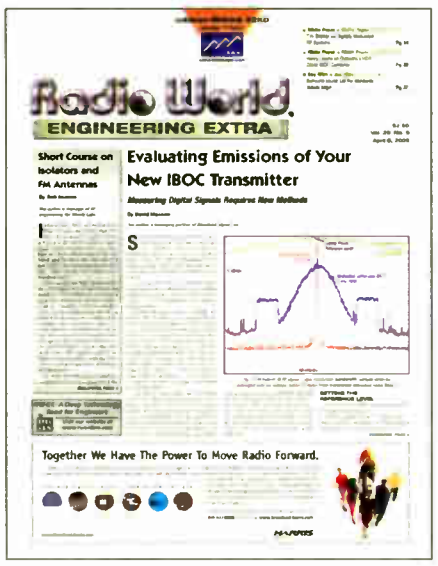
Bill Harland of ERI on planning factors for FM IBOC operations;

A primer on ground loop problems by Bill Whitlock of Jensen Transformers;

An interview with Richard Schrag of Russ Berger Design Group on studio acoustics;

David Maxson on evaluating emissions of a new IBOC transmitter;

Details from Broadcast Electronics on its new 4M Modulation scheme for AM;



A short course on isolators and FM antennas.

We have lots more in the pipeline. RWEE is published six times a year. Radio broadcast engineers, visit www.rwonline.com/eng-extra to subscribe.

Surround Sound Debate Abounds

by Daniel Mansergh

Surround sound is one of the big radio technology topics at this month's NAB2005 convention. To know what people are likely to be arguing about there, we need look back only as far as the AES show in San Francisco, just a few months ago.

Countless manufacturers in that exhibit hall were showing mixers, monitoring systems, microphone packages, editing software and audio routing systems tailored to the needs of multichannel production.

Surround was highlighted in technical paper presentations, workshops, special events and tours, and even the kiosks set up outside the meeting rooms to showcase the latest audio productions from the video game industry were designed with a 5.1 monitoring system built in.

Broadcasters are now in the mix.

In a special session open to all conference attendees, "Surround Sound for Digital Radio," representatives from established players in the world of multichannel audio along with newcomers discussed several proposed approaches to bringing a surround experience to what historically has been a one- or two-channel medium.

Dolby, SRS

Panelists who touted the merits of their companies' respective surround technologies represented two big names in film and consumer audio surround, Dolby and SRS: Dolby Pro Logic II and SRS Circle Surround.

Both systems employ matrixing technologies to squeeze multiple channels of audio into a stereo signal, allowing existing two-channel distribution systems to carry surround programming, although they differ in the specific techniques for achieving this feat.

Rocky Graham, manager of Digital Television Applications for Dolby Laboratories, argued the case for Dolby's Pro Logic II, a new version of the system that is familiar to many consumers as the standard surround audio format on VHS videotapes and analog TV programming.

Graham detailed what he characterized as improvements of Pro Logic II over its predecessor: two discrete full-bandwidth surround channels as compared to one seven-kHz channel, more responsive channel-steering logic, and new options to optimize the system for different types of programming in different listening environments.

But the biggest advantages of the Dolby system, Graham said, are the ubiquity of compatible receivers, large library of available Pro Logic-encoded content, and compatibility with existing two-channel broadcasting infrastructures.

Alan Kraemer, executive vice president of technology and business development for SRS Labs, described Circle Surround in similar technical terms while emphasizing some of the differences between the two matrix-based systems. Key among these are the ability of the SRS system to create a virtual surround environment from mono or stereo sources using SRS technologies and the availability of a suite of signal processing capabilities that complement the Circle Surround decoder in an automotive listening environment.

Circle Surround Automotive, Kraemer said, offers additional technologies that enable automotive audio system designers to optimize the listening experience of passengers throughout the vehicle, including extended bass reproduction, vertical image control and dialog clarity enhancement.

Both Graham and Kraemer pointed to the large number of existing products that use their respective technologies, suggesting that broadcasters may find that these established systems are the quickest way to step into the world of surround. They also took pains to point out that their approaches were compatible with any of the other surround technologies being considered for broadcasting.

Rocky Graham of Dolby Labs said new technologies such as spatial coding offer some promise, but may not completely replace matrix and discrete systems.

Spatial coding systems

"New technologies such as spatial coding" offer some promise, Graham said, "but they may not completely replace matrix and discrete systems."

If the two matrix-based systems appeared to the audience to share a common ancestry, two new surround systems backed by a pair of industry heavyweights do also. Frank Foti, president of Telos Omnia, and Bob Orban, chief engineer of Orban/CRL, both legendary names in broadcast audio processing, presented overviews of two surround systems that would reserve a portion of the HD Radio bitstream for surround-only information.

This approach, dubbed spatial coding, delivers a complete stereo signal in the main portion of the HD Radio bitstream (80 kbps in both examples) along with an additional data channel (16 kbps) that contains only spatial cues. A surround-enabled receiver would reconstruct a complete 5.1 sound field from both the audio and spatial data, while a standard IBOC receiver would decode only the stereo audio channel, said participants.

The similarity of the two systems is no accident; Fraunhofer IIS (developer of the MP3 and AAC audio codecs) and spinoff Coding Technologies (creators of Spectral Band Replication, aacPlus and the HDC coder used in the HD Radio system) have both been working closely with MPEG to standardize their approaches to spatial coding technology through MPEG. Fraunhofer has partnered with Telos/Omnia to develop its version for the HD Radio system, while Coding Technologies has done the same with Orban.

Both Foti and Orban said spatial coding delivers a superior surround experience to the listener, because the system delivers discrete surround channel information and spatial distortion problems associated with matrix systems are avoided. "Surround is the next big thing," Foti predicted, challenging broadcasters to "get on board."

In a dramatic conclusion to the ponent presentations, three panelists teamed up to demonstrate the merits of a very different surround technology: Neural Audio's Spatial Environment Engine.

Tony Masiello, XM Satellite Radio's senior vice president for broadcast operations, led the trio with a discussion of the significant costs to be borne by broadcasters preparing their plants for discrete multichannel audio distribution. To upgrade all the routing, editing, mixing and storage systems in XM's facility, which provides a continuous stream of 130 channels, would be an involved and expensive undertaking.

These financial realities led XM to adopt the Neural system for its surround programming offerings, Masiello said. The Neural equipment is inserted at key points in the XM plant that were designed for surround, with the audio then stored and distributed as stereo throughout the rest of the plant. "No more bits, no new consoles," Masiello said.

Masiello concluded by introducing a seven-minute demo of Neural-encoded surround material broadcast live via XM to a receiver in the meeting room, decoded by a Neural SEE appliance, and reproduced by a Meyer Sound Labs 5.1 monitoring system.

(Editor's note: XM clarified later that when a subscriber listens to XM's 67 music channels through a matrix-type system such as Dolby ProLogic, the system will produce a matrix-type surround sound. For discrete 5.1 surround sound, XM demonstrated a 5.1 demo channel at AES, the Consumer Electronics Show and other events.)

Robert Reams, chief technology officer and co-founder of Neural Audio, followed with a discussion of the SEE technology. According to Reams, the system embeds spatial information within the stereo audio signal (leading some to call it a "watermarking" system) with enough resolution to represent the entire sound field.

Neural SEE decoder

The Neural SEE decoder on the receiving end is then able to reconstruct a 360-degree model of the original sound field and render up to 256 discrete channels of audio within that model, dependent on the configuration of the playback environment. This ability to fine-tune the placement of individual playback channels in a sound field independent of the source audio is a powerful tool, said Reams, especially for automotive system

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Newswatch

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The companies involved, Radio Assist Ministry Inc., Edgewater Broadcasting and World Link Radio Inc., filed a motion denying wrongdoing and asked the FCC to dismiss the request.

Arbitron Replacing PPM Field Meters

NEW YORK Arbitron's Personal People Meter test in Houston began in January, but the audience research firm is replacing all meters in the field.

Daily hardware quality tests built into the system showed that a "small number of meters had a failed connection between the microphone and the PPM circuitry," the company stated in a summary of information shared with Houston stations and advertisers in March.

"Our objective is not to release any Houston PPM data until we are satisfied the total PPM system is operating at an optimum quality level."

The firm will extend its panel recruitment until June 30; it hopes to have more than 2,000 people wearing the meter by then.

Arbitron also has incorporated a time stamp into the PPM encoder. The PPM data now include the time a program aired and the time a panelist heard it.

The first data delivery showing comparisons between PPM and diary use now is slated for late summer, with a one-month delay due to the meter replacement.

Hill Leaders to Press For Indecency Parity

WASHINGTON Republican leaders of the House and Senate Commerce Committees said they would push for parity between broadcasters and cable and satellite in the regulation of content.

Speaking to a group of broadcasters gathered for NAB's State Leadership Conference in March, Senate Commerce Committee Chairman Ted Stevens, R-Alaska, and House Commerce Committee Chairman Joe Barton, R-Texas, vowed to introduce legislation to make broadcasters, cable and satellite broadcasters subject to the same indecency rules, Reuters reported.

The FCC treats subscription services, such as cable and satellite TV and radio, differently than over-the-air broadcasters in this regard. Indeed, the more relaxed standard is why Howard Stern has said he plans to leave Infinity for Sirius Satellite Radio.

Asked for comment by Radio World, Sirius declined to comment and XM did not immediately respond.

Bill Would Keep Satcasters National

WASHINGTON A bill has been introduced in Congress that would keep satellite radio national. Rep. Chip Pickering, R-Miss., has introduced the Local Emergency Radio Service Preservation Act of 2005.

The measure would not restrict satellite radio companies from airing local content, such as their local traffic or weather channels, but would make sure they continue to air those nationwide, and not solely in local markets.

Pickering said he listens to satellite radio in his truck and enjoys it. If the bill is passed, he said, subscribers would see no change in service.

The measure also instructs the FCC to study the impact on local broadcasters of satellite radio companies providing local content, including questions of community needs, public affairs, local voice, Amber alerts, traffic conditions and emergency broadcasts.

Pickering and Democratic Rep. Gene Green of Texas introduced identical legislation last year.

NAB: Scientists Not Sure If Towers Kill Birds

WASHINGTON The NAB says scientists don't really know for sure that taller towers with lights or guy wires represent more of a hazard to migratory birds than do shorter, unlit towers. NAB and a wireless association stated this position in a filing to the FCC.

The commission and the U.S. Forest Service are trying to gather information to determine if towers cause mass bird deaths, as some environmental groups believe.

Last year, then-FCC Chairman Michael Powell said there's not enough evidence to know one way or another, so the agencies commissioned an environmental study. NAB and the wireless association say the main conclusion reached by Avatar, which performed the study, is that "scientific evidence on communication towers and avian mortality is inconsistent."

NAB said the agency doesn't have the legal authority to require industry to fund research to determine whether certain tower characteristics affect bird collisions.

Blair Back To Enforcement; Pepper Upped To OSP

WASHINGTON Linda Blair has returned to her position as deputy chief of the 5-year-old Enforcement Bureau in the wake of David Solomon's impending retirement. Blair was deputy chief from late 2001 to late 2004 and oversaw the work of the field offices as well as broadcast and spectrum-related matters.

Blair most recently had been acting chief of the commission's Office of Strategic Planning and Policy Analysis. Robert Pepper takes over that role. Pepper is the commission's chief of Policy Development.

Solomon is leaving the FCC after 18 years. He intends to depart in May.

Ibiquity Digital Grows in Detroit

COLUMBIA, Md. Ibiquity Digital is expanding its Detroit staff. The company has hired Steven Cowherd as senior director of OEM business development, based in the Pontiac, Mich. office. He comes from the auto industry and will be responsible for working with vehicle manufacturers and their suppliers to deploy HD Radio technology and telematic applications.

Cowherd most recently worked at Visteon, where he held several managerial positions in marketing, sales and business planning, and expanded Visteon's business for U.S., European and Asian auto manufacturers.

He reports to Jeff McGannon, Ibiquity vice president of OEM business development.

Surround

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designers.

Reams also presented a demo, played back from CD, of additional samples of Neural-encoded surround audio.

Mike Pappas, chief engineer of Denver jazz station KUVO(FM), rounded out the Neural discussion with an overview of his "real-world" experience with the live broadcast of vocalist Diane Reeves appearing with the Colorado Symphony Orchestra in September.

Although KUVO touted the effort as the "First Live Surround HD Radio Broadcast," Pappas characterized the event more as a test to determine how well the system could create a stereo downmix from the live surround mix, and what effect the surround encoding would have on the stereo broadcast.

Overall, Pappas was pleased with the results of the experiment. The Neural system "makes great sounding stereo from 5.1 content," he reported, and the station received many compliments on the quality of the broadcast. To wrap up his presentation, Pappas played a segment of the decoded Neural surround from the recording of the event.

Michael Lyons, vice president for Aftermarket Business Development at Ibiquity, was the only panelist not discussing a specific surround technology. He reiterated his company's stance on broadcast enhancements such as surround, saying that the HD Radio system provides the "pipe" for data to be delivered from the broadcaster to the consumer.

"Our responsibility is to review any and all surround systems to ensure that signal integrity on output matches the input," Lyons said. He was encouraged by the presentations the various surround system proponents made, Lyons concluded, since "everyone has the consumer in mind."

On that point, all of the panel's participants seemed united; there was a clear consensus that an industry-driven standard for surround would be essential. The memory of AM stereo, apparently, looms large, and no one on the panel wanted to see surround radio suffer the same fate.

DIGITAL NEWS

DRM to Expand to FM, Combine Efforts With DAB

PARIS Could Ibiquity be shut out of digital radio in Europe? The backers of two technologies, Digital Radio Mondiale and Eurkeka-147, are closing ranks and combining efforts.

The members of the Digital Radio Mondiale consortium have decided to extend their digital radio technology, which now covers shortwave, AM and longwave, up to 120 MHz. The DRM consortium also plans to combine efforts with the World DAB Forum, promoters of Eureka-147 technology, on some projects.

Although the World DAB Forum and DRM had announced cooperation earlier, at the IFA consumer electronics show in Berlin in 2003, they've now solidified their plans.

DRM says it will begin work on its band extension project immediately and expects the design, development and testing phases to be completed by 2008-2010.

In a statement, the technology backers said, "This landmark decision will enhance the range of digital radio solutions offered by the DRM consortium and the World DAB Forum, which work together on projects of mutual interest. In combination with one another, the digital systems of the World DAB Forum and DRM will provide tailor-made solutions — even in the same bands."

DRM Chairman Peter Senger said Eureka-147 "has established itself as a successful solution for the higher-frequency bands in many countries, and broadcasters are increasingly implementing DRM for the medium-wave and shortwave bands. DRM's expansion into the broadcasting bands up to 120 MHz will supplement these existing solutions."

Ibiquity declined to comment in the weeks following the announcement about how the news might affect its ability to sell its technology overseas.

Karmazin Theorizes About Local Ad Money

NEW YORK The new Sirius president/CEO is expected to go after more ad money. Now Mel Karmazin has spoken, at least theoretically, about getting into local advertising if his company could gain exclusive rights to sports broadcasts as terrestrial radio loses interest.

That might happen, he said, as teams demand to control ad sales or surprise local broadcast rights-holders by arranging for their feeds to air on satellite radio.

Karmazin told the Bear Stearns Media Conference in March that some teams have approached the satcaster about obtaining exclusive sports rights. If this scenario played out, Karmazin said, Sirius could air the local feed nationwide, as it does for NFL games now; but Sirius would sell the ads, instead of simply re-transmitting the feeds of local broadcasters.

XM's Third Bird Launched

WASHINGTON XM-3 is in orbit. Using a Zenit-3SL rocket, Sea Launch sent XM Satellite Radio's third spacecraft into space on Feb. 28 from a platform on the equator in the Pacific Ocean

The Boeing 702 satellite was inserted into a geosynchronous transfer orbit on its way to an orbital location for routine testing prior to placement in its final position at 85 degrees West Longitude. A ground station in South Africa acquired the spacecraft's signal an hour after liftoff, noted XM.

Sea Launch also launched XM's previous satellites, XM-1 and XM-2. The latest satellite, and a fourth to be launched in 2007, will replace XM-1 and XM-2; a solar array problem, acknowledged by Boeing, has shortened their lifespan.

XM President/CEO Hugh Panero

The satcaster said the design flaw was fixed in its third satellite. The launch was expected to cost about $190 million. XM has negotiated all but 20 percent of the roughly $400 million total replacement cost for two satellites from its satellite insurer and is in arbitration for the rest, executives have said.

— Leslie Stimson

WHUR

▶ Continued from page 1

to CDs. The digital theme is carried over to special remotes; the logo shows up on a mouse pad from Disney World, for example.

The station gives out "HD Radio Club Cards," WHUR's version of loyal listener cards, which incorporate its digital radio branding and are tied to promotions. Listeners may obtain applications for the card at in-store appearances, nightclubs, client promotions and other places its HD Radio Demonstration van appears. The applications will soon be available on the station Web site.

Radio World News Editor/Washington Bureau Chief Leslie Stimson spoke with Watkins about his experiences promoting the station and HD Radio.

Photos by Leslie Stimson

WHUR is using the HD Radio logo on giveaways.

***RW:** Tell us about the HD Radio Club Card; how does it work?*

Watkins: If the listener gives (the merchant) this card, they get discounts. Regency Furniture just signed with us. If you show them this card they'll give you 10 percent off of your furniture purchase.

We'll be doing other events, for instance, special movie premieres. The only way to get in is to get your card because we don't want it to be looked upon as an inexpensive commodity.

This is the second edition of the card. This card's even better than the first one. ... The clearness of the card refers to the crystal-clear sound of HD Radio. It's all thought out. ... This card represents our ownership... The words "Howard University" are right there, with the station name, the fact that you can hear streaming and the fact that we're HD Radio; it's all on the card.

***RW:** What kind of stores are you choosing to honor this card?*

Watkins: We're looking at the clients that, one, do a lot of business with us, and two, that offer a more upscale clientele. ...

One of the things that we're going to be doing, in the very near future, is since each card has its own serial number and its own bar code, we will start just giving out a number on the air. And you'll have so much time to call back in, and you've won a prize.

My plans are to give away an HD Radio every day for a year. That's my strategy with that. I've inked a deal with Boston Acoustics (for) their new Receptor radio.

The (model) for HD has the HD logo and another speaker on the side. ... We bought them. We'll give away 365 radios. And the only way to get the radio is to have the card.

We're kind of getting over the problem that we've had this technology but no one can really listen to it because it's too expensive. We'll seed the market with 365 radios within a year. I'm sure some other stations will be doing the same thing. We've got to do that if we're going to make people reach for that.

***RW:** Ibiquity is encouraging group buys. Did they arrange a deal for you?*

Watkins: They arranged a deal for us with Panasonic. We'll be giving away several Panasonic in-dash radios as well. They should be arriving in the next few weeks. They'll be the first ones we give away.

These (Boston Acoustic HD Radios) are in the manufacturing cycle now, so it might be a couple of months. With the Panasonics I'll give away, say, one a week, and then, when we get these (pointing towards a Boston Acoustic radio) it will be one a day.

***RW:** When will they deliver the radios to you?*

Watkins: They'll let me know. It's a manufacturing-process-type thing. Some things you've got to do a little bit on faith. At the time that I talked to them they really didn't have a real concrete cost on the radio. They've been selling to broadcasters on what their projected cost was, which was $300 a radio.

A number of us put in purchase orders for them, so we'll be in the first run. We just got that consummated.

***RW:** So you'll start giving those away one a day.*

Watkins: We will put our logo on the radio. When you get it, you will also see a color WHUR logo somewhere prominently on the radio. We will open each (box) and put our logo on it and seal it back up — because they're giveaways. You may as well.

The whole thing about this business is top-of-mind awareness. If you're top-of-mind, you can win.

***RW:** How is HD Radio going to help you compete?*

Watkins: HD Radio from one side has reinforced our positioning as a technological leader. Doing new things. Trying new things. Being on the cutting edge. That's great positioning.

Because we are in the infancy of this thing, we get the chance to do all the experimentation. To try things. To fail. We can try something, fail, and nobody even knew we even tried it. Which is good.

***RW:** To give you time to incubate it...*

Watkins: Sure. The basics are here. They are bought and paid for. So we can move on and say, "How do we integrate this?"

My promotions people are always looking at other ways that they can get more people to get the HD Radio cards. Because here at this radio station we look at HD as just another routine part of the station.

Think about it. In the early days, it was just, "Howard University Radio-WHUR." Then streaming came along so now we have "WHUR.com." Now we have HD Radio, so we have all types of different ways to extend that brand. It's all about brand extension.

And being a stand-alone radio station in this market, we need to do things that make us stand out, that people will remember we're involved with.

***RW:** Ibiquity had a traffic demo on the display of a Boston Acoustic radio at CES.*

Watkins: Ibiquity has been very, very good in supporting the radio stations. All you have to do is ask for the help. I'm lucky because they're in Columbia (Md.), and it's easy to pick up the phone ...

I guess I've kind of worried them to death; but we really saw this as an opportunity that would really take off. And as you can see, now all the big boys are doing it.

I'm glad as a radio station we got into the fray early, because we don't have to stand in line to get equipment. We're getting the experience that we need to have with HD Radio; and the little nuances kind of go along with that. As you can see, it's a part of the fabric of what we do here, on the air... No less than three times an hour we announce that it's HD Radio, usually with promos.

***RW:** Yes, I'm still hearing that audio logo.*

Watkins: It's not going anywhere. Even in a couple of Arbitron ratings people have mentioned HD Radio, even though they can't hear it, which tells me that the marketing we've been doing is working.

The mobile units, demonstrations, go on locations for what we call "van hits" at any promotion, and the driver is well-versed in what HD Radio can do, he can demonstrate the radio ... can do the comparisons.

People say, "Where can I get it?" They hear the difference. We're just opting out the HD Radio that we have in there now, which was an early Kenwood unit, for a new Kenwood unit, a DVD unit, that has better displays for HD Radio.

Now we have clients who say, "Are you going to bring the van with you?" Which is great because then you can go ahead and say, "I can bring it." In the packages that go out to clients, it's

See WHUR, page 10 ▶

The routing switcher gets a new twist.

(About five twists per inch, actually.)

Everybody needs to share audio. Sometimes just a few signals — sometimes a few hundred. Across the hall, between floors, now and then across campus. Routing switchers are a convenient way to manage and share your audio, but will your GM really let you buy a router that costs more than his dream car? Unlikely.

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Routers are OK... but a network is so much more modern. With Axia, your ins and outs are next to the audio, where they belong. No frame, no cards, no sweat.

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An expensive proprietary router isn't practical for smaller facilities. In fact, it doesn't scale all that well for larger ones. Here's where an expandable network really shines. Connect eight Axia 8x8 Audio Nodes using Cat-6 cable and an Ethernet switch, and you've got a 64x64 routing switcher. And you can easily add more I/O whenever and wherever you need it. Build a 128x128 system... or 1024x1024... use a Gigabit fiber backbone and the sky's the limit.

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Even the best sound cards are compromised by PC noise, inconvenient output connectors, poor headroom, and other gremlins. Instead, load the Axia IP-Audio Driver for Windows® on your workstations and connect *directly* to the Axia audio network using their Ethernet ports. Not only will your PC productions sound fantastic, you'll eliminate sound cards and the hardware they usually feed (like router or console input modules). Just think of all the cash you'll save.

Livewire

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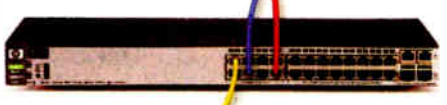
Put your snake on a diet.

Nobody loves cable snakes. Besides soldering a jillion connectors, just try finding the pair you want when there's a change to make. Axia Audio Nodes come in AES/EBU and balanced stereo analog flavors. Put a batch of Nodes on each end of a Cat-6 run, and BAM! a bi-directional multi-channel snake. Use media converters and a fiber link for extra-long runs between studios — or between buildings.

An Axia digital audio snake can carry hundreds of channels of digital audio on one skinny CAT-6 cable. We know you're not going to miss soldering all that multi-pair...



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With a little help from our friends.

A networked audio system doesn't just replace a traditional router — it *improves* upon it. Already, companies in our industry are realizing the advantages of tightly integrated systems, and are making new products that reap those benefits. Working with our partners, Axia Audio is bringing new thinking and ideas to audio distribution, machine control, Program Associated Data (PAD), and even wiring convenience.

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There are plenty of ways to control your Axia network. For instance, you'll find built-in webservers on all Axia equipment for easy configuration via browser. PathfinderPC® software for Windows gives you central control of every audio path in your plant. Router Selector nodes allow quick local source selection, and intelligent studio control surfaces let talent easily access and mix any source in your networked facility.

Control freaks of the world, rejoice: intelligent Axia mixing surfaces give talent complete control of their working environment. Reconfigure studios instantly and assign often-used sources just where they're most useful.

"This sounds expensive." Just the opposite, really. Axia saves money by eliminating distribution amps, line selectors, sound cards, patch bays, multi-pair cables, and tons of discrete wiring — not to mention the installation and maintenance time you'll recover. And those are just side benefits: our hardware is about half the cost of those big mainframe routers. That's right... *half*. Once you experience the benefits of networked audio, you will never want to go back. AxiaAudio.com for details.

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Axia products are available in the USA from Broadcasters General Store and Broadcast Supply Worldwide. See www.AxiaAudio.com/buy/ for more information.

WHUR

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one of the things that's there.

RW: The van sheet says it's a two-hour demonstration. Are you going to give away radios with these, too?

Watkins: What we'll do is a prize wheel-type thing or a drawing to make it exciting. When we take it out there, we're being paid to be out there. I'm actually making some money on this. It puts the station out there. It shows the technology.

RW: Are the people who request the van also the ones who support your station card?

Watkins: The people who request the van are current advertisers and vendors. We still take the unit out to any advertiser that shows any kind of interest at all in HD Radio. If they say, "What is HD Radio," the account executive says, "We'll bring it to you."

We'll send it out so they can listen to it and get the demonstration, because most of them see the real value of having the extra data streams there. For instance, if you're trying to sell a record ... you could put on the PAD (program-associated data) "Get it now at a special price at Best Buy." And you can charge the advertiser for that.

Or, you can program it to say, "Give this coupon number and get an extra 15 percent off." ... Because what happens is, once you have the HD Radio, and you have enough people who are doing it, you can start to measure what kind of response you get by putting on all those extra messages.

RW: You charge the advertiser extra?

Watkins: Yes. We plan, probably in the summer, to initiate radio greetings. We can put a message on your RDS radio or your HD Radio that you can purchase. So, I can say 'Happy birthday, Leslie' on your RDS radio at a certain time during the day, and charge you for it. ...

Anyone who invests in this now, it may be a two-year, three-year ramp-up. For me, by that time I'll have complete digital studios, probably new studios is what I'm looking for. We'll be able to do all kinds of stuff. We'll have the kind of capacity that we can really exploit this technology. But you can't start out that way. ...

RW: You were mentioning you're starting to get Arbitron mentions. What kinds of things are people writing about you in the diaries?

Watkins: It's interesting, they write, "HD Radio sure sounds great." That's when I'm going, "I hope you have a receiver."

RW: Are they listening on analog?

Watkins: Probably. The thing that happened to this station, as we made the transition to HD, we did a lot of cleaning up of our audio chain, so when we made that hit, you did hear a difference in the analog.

We also ... went to a new AudioVault system, and everything, all of our music, and commercials are all uncompressed. It's all linear. So we had to have more storage capacity.

What we have left to do, we have a new Harris console to go into master control. It's sitting on the bench now in test. So when we put that on, it will complete that part of the whole digital chain. I've looked it as an incremental-type thing. ...

RW: Are you doing the new second-generation importer/exporter improvement where Ibiquity and vendors such as Harris and BE have moved the data capabilities back to the studio rather than sending it all through the STL?

Watkins: Not yet. For the first year, we have a deal with dMarc system because dMarc was doing a lot of things with RDS and had certain solutions at the time that were not available when we went HD. Now

See WHUR, page 12 ▶

Watkins Got the Broadcast Bug at 10

Millard James Watkins III knew he wanted to work in broadcasting when he was a 10-year-old in Richmond, Va.

His father sold TVs door-to-door and owned one of the first sets in the area. "My parents have a picture of me in front of the TV in the playpen," said Watkins, who goes by Jim.

"I exhibited, early on, a mechanical aptitude."

That interest led him to his first radio job, as a part-time disc jockey at 14 at Richmond's WENZ(AM), which Watkins describes as a Class IV with a "pitiful" sound.

Precocious and persistent

But he didn't just walk into the job; the general manager was reluctant to hire him. Watkins recalls that the GM asked what he wanted to do; he replied that he wanted to be an engineer.

"He starts laughing and says, 'Black people can't be engineers.'"

Watkins persisted, got his third-class license and won the position, which he held throughout high school, forsaking girls and sports. "I wanted to fix the equipment; I wanted to build the equipment."

After graduation, Watkins moved to Washington to attend Grantham School of Engineering to obtain an engineering degree. In 1968, he received his first class FCC radiotelephone license and was hired as the first African-American engineer at the Washington News Bureau of ABC News.

In 1971 he was setting up audio equipment one day on Capitol Hill when he overheard two members of Congress talking about Katherine Graham, former owner and publisher of the Washington Post, giving the license of the former WTOP(FM) to Howard University.

The lawmakers were laughing, he said, at the thought of Howard being able to operate the station.

After he got off work that day he went to Howard and volunteered to help build the new studios. At 19, Watkins was a chief engineer and responsible for the technical designs, stereophonic conversion, transmitter upgrade and training of the WHUR staff. He took the position full-time and later, along with engineering students, was also responsible for the studio construction of what was then WHMM(TV), now WHUT, which went on the air in 1980.

Watkins served as director of operations and engineering for the TV operation until 1984. The university asked him to take over as manager of WHUR in 1985. He took the station from gross billing of $2.1 million in 1985 to more than $16.5 million by 1999.

The station is in its 33rd year on the campus of the historically black Howard University.

WHUR went on the air in 1971 and has been self-sufficient since 1986. It turns back a portion of its profit every year to the university, said Watkins, who declined to release specifics.

Watkins managed both WHUR and WHUT from 1996 to 2002.

Digital air chain

WHUR upgraded its studio automation and is benchtesting a Harris console to make its entire air chain digital. Watkins previously estimated the HD Radio portion of the upgrade at $100,000 and the rest of the improvements at about $400,000. The station needed a new transmitter and new antenna to go digital.

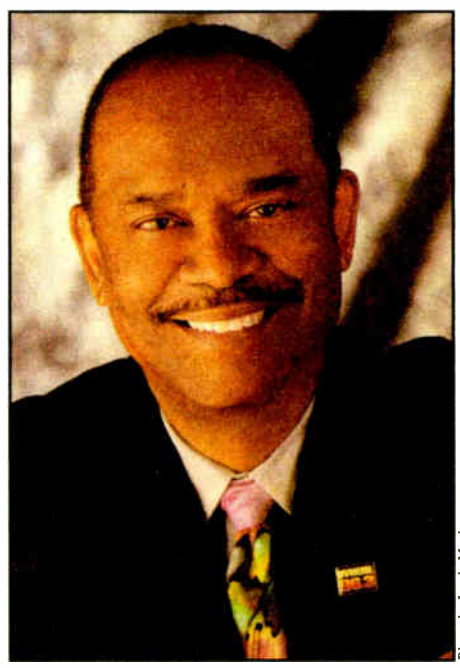

Photo by Louis Myrie

WHUR General Manager Jim Watkins

The station purchased a Harris Z-Series 28,000-watt solid-state FM digital transmitter using the Dexstar HD Radio exciter. The system comprises four Z16HDC transmitters combined to accomplish a total power output of 30 kW. WHUR is using low-level combining; the digital and analog signals are fed into a Dielectric combiner. Eventually they will be combined with the analog signals of Clear Channel's WASH(FM) and ABC's WRQX(FM) and fed into a shared Dielectric antenna. All three stations share the same tower (RW, March 1, 2004, page 18).

The 53-year-old Watkins is a member of the SBE and AES and treasurer of the Washington Area Broadcasters' Association.

Watkins and his wife, Regina, met while working at the TV station, where she was the business manager; she is now the owner of a daycare business. They have one son, Millard James Watkins IV, who's recently been accepted to the University of Maryland.

— Leslie Stimson

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WHUR

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these things are happening, so there will be a transition period where we will be able to take on a lot of things ourselves.

***RW:** What about PAD data?*

logical. Now, if someone says they have an HD Radio, that's different.

***RW:** Do you have people who say, "Yes, I've bought one?"*

Watkins: I know of two personally. They were early adopters and they bit the bullet, because now (Washington) has got WETA, WAMU, WHUR and WTOP(AM) (on the air with digital signals).

Photos by Leslie Stimson

The WHUR studios are on the campus of Howard University.

Watkins: Right now on HD we're doing the title and artist. When we start the radio greetings we'll be able to do radio greetings. There's other ideas that we have. We're going to be introducing a new afternoon drive show, syndicated from ABC ... that opens up some experimental avenues, for instance, you could watch your HD Radio and see what the subject is. Once we get our terminal up, we can manipulate what goes in. It's looking for the next, the second- and third-generation of HD Radio.

***RW:** On the Arbitron mentions, when people are saying it sounds great, you're attributing a lot of that to the fact that you cleaned up your air chain.*

Watkins: Sometimes people hear things and it sounds better to them. It's all psycho-

***RW:** Will you have a way of tracking sales of HD Radios?*

Watkins: I really haven't gotten into that. It won't help me until maybe a couple of years down the road.

***RW:** When there are enough sales to track?*

Watkins: Yes. We're kind of out there like we're introducing a part of a new religion, and the first miracle hasn't happened yet.

***RW:** How do you think this whole surround question is going to shake out?*

Watkins: I think surround is an inevitable idea, but from the broadcaster standpoint, the first thing you need to remember is that, if you're going to do surround properly, you've got to have your production room set up properly. You've got to have somebody who knows how to manipulate surround.

***RW:** You mean back and forth between stereo and surround...*

Watkins: Yes and so it doesn't sound like a real gimmick. We got into a gimmick with Quad. We had the old-style home theaters where they would do the music in multi-channel and you had voices that were all over places that really didn't sound natural.

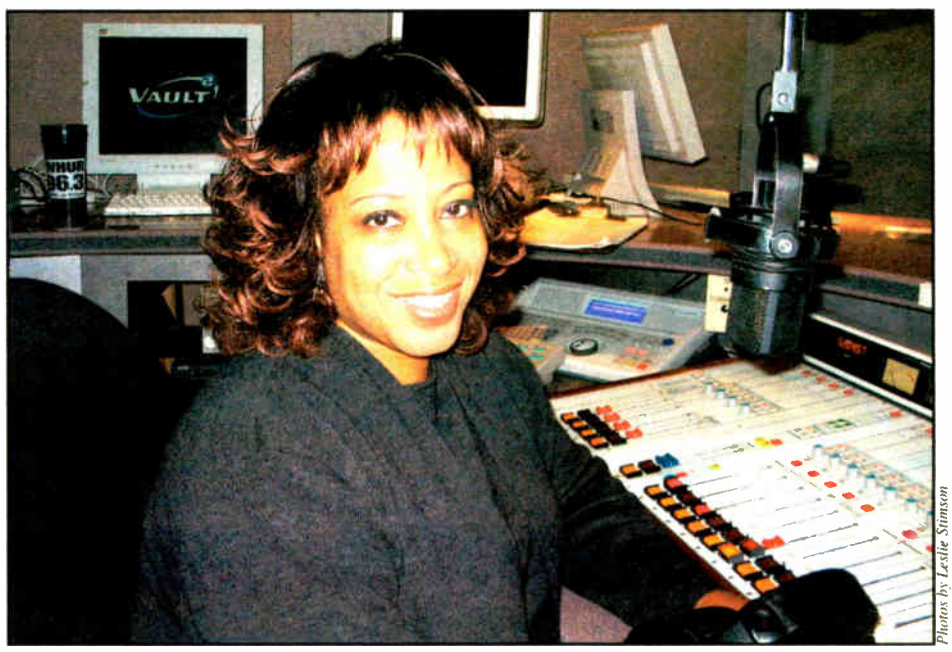
And surround is a more natural-type of sound. If you go to a good theater that's set up properly, the surround is there, but you're enveloped in it. Now, for a special production, you've got the swirling sounds and that kind of stuff, but when it comes to your regular programming, unless you're doing something very special it's got to be subtle and encompassing. We tend to go more gimmicky in our business, and that could kill it.

But that's awhile off. We have enough time for the manufacturers to battle around as to what's going to be the best system for that. And then we broadcasters will have to augment our systems, so we can probably monitor it and do it good artistic justice. ...

We're going to have to use a little good judgment so we don't burn people out with all the gimmicks. That's the kind of option you'll put in your luxury car, in your van, that kind of thing. Will you listen to it at home? I'm not so sure.

***RW:** What do you think about the concept of multichannel, dividing up your FM?*

Watkins: To me, that's really interesting. The only problem that I have with that is that if you're doing any particular format, and for whatever reason, you lose that signal, it's a drop-off. It's a cliff effect. You get nothing. *(Stations can lose the blend-to-analog feature when they split their digital FM stream into several channels.)*



Photos by Leslie Stimson

Triscina Grey hosts middays on WHUR.

RW: Because it's there or it's not there.

Watkins: It's there or it's not there. For some narrow niching, that might be fine. But I still think some more work needs to be done. I think that's really in its infancy. I was reading where a gentleman was talking about getting all the HD Radio stations together and doing multichanel programming, sort of like a multichannel network.

***RW:** At the Ibiquity press conference at CES, some of the radio group executives were talking about getting together to promote HD Radio, but also talking about multichannel. They said it doesn't make sense for all the groups to go in separate directions on all of this, but rather combine efforts. NPR was there; they're putting a lot of money into multichannel.*

Watkins: Let's face it, NPR will be the pioneers in that. For what they do, they have some specific targets and reasons for doing that, which makes sense to me. Us commercial people, we know it's only about making the money. Getting those commercials out there, so even though they're similar, there's some other stuff there.

I think we need to concentrate initially on getting this technology set, rolled out, get it supported. Because there are enough things that go on with the technology that need to be exploited. What I'm talking about is use of PAD, Amber-alert type of stuff.

Does your station promote its digital service? What do listeners think? Tell us about it. Write to radioworld@imaspub.com.

Don't look down

(You're standing on your competition)

More than 60% of the Top 100 highest-rated FM stations in the USA have already upgraded to Omnia-6EX—the six-band dual-path processor for standard FM and HD Radio signals. The reason these leaders choose Omnia? Once you've heard it, you'll know.

The Empire State building is pretty tall. Taipei 101? CN Tower? Even taller. But Omnia dwarfs them all. In fact, if you stacked up all the Omnia audio processors in use around the world, you'd have a tower well over 3,000 feet high.

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.

Speaking of heights, did you know that Omnia processing now powers stations broadcasting from every one of the famous structures pictured above?

Big or small, isn't it high time you upgraded to Omnia?

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Facing Page

Radio World | Covering Radio's Digital Transition | April 13, 2005

GUEST COMMENTARY

Where Has Telos/Omnia Been?

Neural Audio Co-Founder Responds to Questions Posed by Steve Church, Frank Foti

by Robert Reams

This is in response to a Guest Commentary authored by Telos/Omnia's Steve Church and Frank Foti in the March 16 issue.

Where has Telos/Omnia been? The Neural system has been the focus of several presentations, technical panels and demonstrations for AES, NAB and CES since 2001. It has been scrupulously tested and validated by XM Satellite Radio, National Public Radio, Harris, Ibiquity and hundreds of engineers that have taken the time to verify Neural's "outrageous claims."

"Smoke and mirrors" don't survive reality. The Neural technology has been "on the air" for quite some time now and has been proven to be stable, reliable and practical. Many radio stations have planned their air chains to include Neural's surround technology.

Telos/Omnia has received countless invitations to visit the Neural facility and experience Neural's surround technology. They apparently refuse. Somehow, Telos/Omnia continues to cling to the dangerous assumption that bitstream based technologies are compatible with the day-to-day operations of a real, live broadcast facility.

Neural Audio is distributing practical, workable and affordable 5.1 surround sound technology into the radio broadcast arena. That is a fact. The act of casting baseless dispersions in a public forum vs. the due diligence of proving a concept in the field is so lame that it merits a (really old) proverb:

"It is not the critic who counts, not the one who points out how the strong man stumbled or how the doer of deeds might have done them better. The credit belongs to the man who is actually in the arena."

Stop wasting time. Get into the arena and make your system function in the real world. Compete. Prove that it works in a real (from mic to antenna) broadcast environment. Neural has.

Your comments are in italics.

Neural Audio is distributing practical, workable and affordable 5.1 surround sound technology into the radio broadcast arena.

"With the Neural system, stereo is always derived (downmixed) from the 5.1 multichannels [sic]. *Mike, if this is a satisfactory procedure, why don't DVD-Audio and Super Audio CD disks use the same approach? They could save a lot of bits and trouble by providing only the surround mix and letting stereo players do a mechanical downmix. But they never do, instead providing listeners with human-optimized mixes for each mode."*

DVD-A and SACD formats don't have to. Broadcasters don't have these lofty bit rates to work with.

All spatial audio coders, including Neural and the Fraunhofer variant Telos/Omnia is promoting, *must* downmix 5.1 fine structures to two fine structures as part of the spatial compression process. Additional information is provided along with the stereo downmix to reconstruct the 5.1 content.

The "mechanical downmix" is something that has to happen in *all* spatial coding, including Fraunhofer, Agere, Philips and Coding Technologies. Neural happens to have one that works very well.

Criticizing Mr. Mike Pappas for striving for stereo compatibility in his 5.1 mixes is really reaching for something to complain about. If I recall correctly, mono compatible stereo was something that was desirable in the early (and present) days of the broadcast transition to stereo.

Stereo was *never* broadcast along with a separate mono mix. The mono was derived from stereo. History teaches us that the same should be true for the surround transition.

"The KUVO test broadcasts were with a live concert that your station produced for itself in surround, right? So, what reference is available to know that there, "were no surprises in the stereo mix," since there was no stereo original for comparison?"

One of the most obvious "surprises" in any stereo downmix are artifacts in the frequency domain. These are easy to hear as they resemble the objectionable effect ("comb-filtering") of early "non-mono compatible" stereo easily recognized by the mature broadcasting engineer.

Non-adaptive, mechanical downmixing used in side information based systems don't account for frequency domain artifacts caused by ITD's in the content. Neural's system does.

"You really need to test with DVD-Audio or SACD music as the source, so you can evaluate carefully and accurately if the stereo is OK. This is going to be critical to acceptance of a broadcast surround system since weird-sounding stereo on familiar music is certainly going to trigger protests from program directors, listeners and owners."

Yes. Objective testing is a good thing to do. Neural prefers MUSHRA (MUlti Stimulus test with Hidden Reference and Anchors) statistical testing as a validation of performance.

During the transition from stereo to surround/stereo interoperability the grand majority of your audience will be listening to 5.1/stereo downmixed content interspersed with legacy stereo. As the transition continues, the majority of listeners will hear the 5.1 original source content reconstructed to 5.1.

The 5.1 content will be interspersed with legacy stereo that is rendered in a 5.1 format. As this happens, all content, regardless of original and/or eventual spatial goals, must be perceived as natural, entertaining and in context with the intention of the original content.

"What was done to try and damage it? No details were provided on the signal path for your experiment. But the exceptional claim that the Neural watermark can pass through multiple codecs with no problem requires exceptional proof!"

Mr. Pappas has authored a painfully

See REAMS, page 16 ▶

Radio World's HD Radio™ Scoreboard

The HD Radio Scoreboard is compiled monthly by Radio World using information supplied by iBiquity Digital Corp. and other sources. The data shown reflect best information as of March 14, 2005. This page is sponsored by Broadcast Electronics. HD Radio is a trademark of iBiquity Digital Corp.

HD RADIO ON THE AM DIAL

Fifty-two AM stations have told Ibiquity they are on the air with HD Radio.

Call Sign	Freq	Market	Owner
WQAM(AM)	560	Miami-Ft. Lau.	Beasley
KOJM(AM)	610	Havre, MT	New Media
WIP(AM)	610	Philadelphia	Infinity
WTMJ(AM)	620	Milwaukee-Racine, WI	Journal B cst. Group
KHOW(AM)	630	Denver-Boulder	Clear Channel
KFI(AM)	640	Los Angeles	Clear Channel
KFXN(AM)	690	Minneapolis-St. Paul	Clear Channel
WOR(AM)	710	New York	Buckley B cst.ing
WKDL(AM)	730	Washington	Mega Communications
KCBS(AM)	740	San Francisco	Infinity
WSBR(AM)	740	West Palm -Boca	Beasley
WSB(AM)	750	Atlanta	Cox
KOAL(AM)	750	Price, UT	Eastern Utah B cst.ing
KKZN(AM)	760	Denver-Boulder	Clear Channel
WGY(AM)	810	Albany-Schenectady, NY	Clear Channel
WOSU(AM)	820	Columbus, OH	Ohio State U.
KMXE(AM)	830	Los Angeles	Radiovisa
KXNT(AM)	840	Las Vegas	Infinity
KOA(AM)	850	Denver-Boulder	Clear Channel
KFUO(AM)	850	St. Louis	Lutheran Church
WWDB(AM)	860	Philadelphia	Beasley
KPOF(AM)	910	Denver-Boulder	Pillar of Fire
WPAT(AM)	930	New York	Multicultural Radio
WWJ(AM)	950	Detroit	Infinity
WPEN(AM)	950	Philadelphia	Greater Media
WXGI(AM)	950	Richmond	Gee Communications
WHSR(AM)	980	Miami-Ft. Lau.	Beasley
KTNQ(AM)	1020	Los Angeles	Univision Radio
WBZ(AM)	1030	Boston	Infinity
WHO(AM)	1040	Des Moines	Clear Channel
WIBC(AM)	1070t	Indianapolis	Emmis
KFAN(AM)	1130	Minneapolis	Clear Channel
WHAM(AM)	1180	Rochester	Clear Channel
WOWO(AM)	1190	Ft. Wayne, IN	Federated Media
WCHB(AM)	1200	Detroit	Radio One Inc.
WOAI(AM)	1200	San Antonio	Clear Channel
WTPG(AM)	1230	Columbus, OH	Clear Channel
WMKI(AM)	1260	Boston	ABC Radio
WNDE(AM)	1260	Indianapolis	Clear Channel
WXYT(AM)	1270	Detroit	Infinity
WIZE(AM)	1340	Dayton, OH	Clear Channel
KCFR(AM)	1340	Denver-Boulder	Colorado Public Radio
WJLD(AM)	1400	Birmingham	Richardson B cst.
WCOS(AM)	1400	Columbia, SC	Clear Channel
KMRY(AM)	1450	Cedar Rapids	Sellers B cst./KMRY
WWNN(AM)	1470	Miami-Ft. Lau.	Beasley
KCFC(AM)	1490	Denver-Boulder	Colorado Public Radio
WOLF(AM)	1490	Syracuse	WOLF Radio, Inc.
WTOP(AM)	1500	Washington	Bonneville
WLAC(AM)	1510	Nashville	Clear Channel
WSAI(AM)	1530	Cincinnati	Clear Channel
WILO(AM)	1570	Frankfort	Kaspar B cst.

The Bottom Line

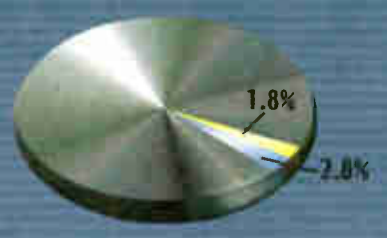
Total Licensed	On the Air
619	244

Last Month

Total Licensed	On the Air
549	233

Market Penetration United States

13,525 AM & FM Stations



No. of Stations Licensed, Selected Owners

Clear Channel Radio	65
Infinity	12
Cox	21
Entercom	25
Radio One	19
Minn. Public Radio	35
Temple Univ.	6
Univ. of Wyoming	13
Colorado Public Radio	9

Reams

▶ Continued from page 14

detailed account of validating the performance of the Neural system. Extensive tests performed by National Public Radio agree with Mr. Pappas' findings... "The audio will fail before the watermark does." The article appeared in a recent RW supplement about the "Toast of the Nation" broadcast.

"In a recent Radio World article, Neural gave 16 kbps as its watermark bit rate. A 5-10 bits-per-second rate is considered robust in the context of anti-piracy watermarking. Experts say that around 100 bits per second would be pretty much the limit in order to withstand passage through usual codecs."

After a review of Radio World articles, I don't see where Neural gave 16 kbps as the "watermark bit rate." Neural doesn't discuss the capacity of the watermark. *(Ed. Note: In the Nov. 17, 2004 issue, Mike Pappas of KUVO made reference to a 16 kbps watermark data rate. Neural disputes the figure.)*

The *real* innovation of the Neural system isn't in the watermark, it's in a new ultra-efficient (patent-pending) method for translating the ITD, ILD and ICC spatial descriptors to a format that *naturally fits* watermarking.

Benchmarking the performance of a spatial audio coder by the *available* side information data rate under ideal conditions is a *bad idea*. Side information doesn't survive editing (cross-fades, voice-overs), tandem coding (ISDN, STL's, etc.), analog (mixers, processors or cross-points) and *always* penalizes the consumer with the side information cost even when they are hearing stereo or mono. The question to be asked is "does it get the job done in the broadcaster's real world?" XM, NPR and Harris think so.

Even Fraunhofer claims that its "Scalar Costas Scheme"-based watermarking has a low error rate data capacity of about 6.8 kbps. Don't sell watermarking short.

"So what is going on here? What is really the rate, and what tests have been performed, under what conditions?"

Users of the Neural system have been less concerned with the watermark bit rate and more concerned with the performance under real-world conditions. It has been tested under the most stringent of real-world conditions (by independent parties) and the spatial information it conveys clearly survives.

"Since the system is being proposed for analog FM as well as HD, what happens to it with multipath?"

Neural didn't originally propose its system for analog broadcast. However, many a clever broadcaster has concluded that conditions that support stereo content work just fine with the watermark.

It isn't, however, designed to work transparently through a mono format. Under heavy multipath conditions, the 5.1 system could "blend" to a "synthetic aperture" format, the spatial equivalent of the "blend-to-mono" feature of present stereo receivers. Under those conditions it could be used with analog broadcast with no more difficulty than regular stereo.

"Neural's secrecy is a barrier to making a valid assessment of their quite outrageous claims."

Neural's claims are not outrageous to those skilled in the art. Yes, there is secrecy. All broadcast and receiver manufacturers/OEMs work with Neural under strict non-disclosure agreements. With an NDA in place there is *no* barrier to disclosure and assessment.

"What would happen if two pre-coded [sic] *sources (music stored on a delivery system, for e.g.) were to be cross-mixed on-air?"*

A flawless, artifact-free, on-air cross-mix.

"During the overlap time, wouldn't the watermark be corrupted and the received result sound pretty bad, or collapse to stereo?"

No.

"Has cross-mixing been demonstrated?"

Yes. It works very well.

"How would a surround or panned mic be added to the mix for voice-overs? This is something you wouldn't have tested in your live concert demonstration, but certainly cross-mixing and announcer voice-overs are routine in normal radio programming."

am also sure that the folks at NPR would be fascinated in Mr. Church and Mr. Foti's proposal for shipping a discrete 6 channel bitstream though the PRSS satellite distribution system to all of the NPR member stations for "near zero additional cost."

You must allow the broadcaster to upgrade at a pace that makes fiscal sense.

"Would you prefer to save those (spatial information) 16 kbps for a cell-phone-grade voice something or other, rather than provide a capable and compatible surround service? We respectfully disagree."

Talk to the radio stations, guys; 16 kbps can produce much higher quality than a cell phone. There are many speech and data services that generate far more revenue than the promise of surround "someday."

"Anyway, there will probably soon be more bits to play with. Ibiquity has a proposal before the FCC to increase HD Radio's data rate from 100 to 150 kbps and there are technologies on the horizon to deliver yet another 64 kbps within the current SCA spectral space."

"Probably," "soon" and "on the horizon" are not words that instill enough confidence in the broadcaster to move on a technology. It has to be proven that it works *now* with what they have *now*. Future available data will be used for more revenue generating services such as more channels and more data services.

Users of the Neural system have been less concerned with the watermark bit rate and more concerned with the performance under real-world conditions.

Intensity/coherence watermarking bears a strong spatial resemblance to the natural construct of legacy stereo or panned mono sources. Downmixed 5.1 may be mixed with stereo and/or mono with no ill consequences.

In fact, mono, stereo and 5.1 cross-mixing was an integral part of the broadcast. The received broadcast was flawless in both stereo and in 5.1

"...the incremental costs to move from stereo to discrete surround are near zero. The majority of studios on-air today are still analog and need to be upgraded to digital anyway, so the surround capability comes along for the ride. Surround, digital and networking are coming together fortuitously."

Total, overnight displacement of any broadcast infrastructure is not going to happen. It *is* expensive.

To be successful, technology must work within an existing infrastructure, expanding capabilities while preserving downward compatibility with legacy formats and content. If a technology requires the client to "replace everything" it will meet with tremendous resistance.

I would bet all of the Radio World readers would love to see a detailed cost accounting showing how there is "near zero incremental cost differential" in building a discrete 6-channel plant over a conventional stereo one. I

"...a live concert with material no one has heard before and with no stereo reference is no way to evaluate how a system will work for what broadcasters will use it for, day-in, day-out. We need tests with normal radio programming and production techniques."

Neural believes that passing muster with the likes of broadcast giants like XM, Harris Broadcast and NPR is of great value as these are organizations interested in the function of broadcast systems as a whole. This is where Neural has subjected its technology to scrutiny.

At this level, if technology has any holes in it, these guys *will* find it and kill the technology. XM and NPR have validated the performance for both satellite and terrestrial use and Harris, after much due diligence determining that the technology performs as claimed, distributes it. Product is available *now* from Harris. Not probably, not soon, not on the horizon, but *now*.

"Speaking of tests, why hasn't Neural submitted their technology to the scrutiny of the unbiased MPEG testing that has been ongoing the past months? At what point will Neural offer an honest description of their system so it can be evaluated on a reasonable basis? Thus far it's been a lot of smokey words and fogged mirrors."

Neural has been working with MPEG members for years. If you were to actually talk to MPEG, as we actually do, Neural Audio is an MPEG member; you would find that they don't have much to say about *encoding* standards (like on the *broadcast* end).

They only recommend technology on the *consumer* or *decoding* end. That is why testing has been heavily performed on the broadcasting end with organizations that *do* have something to say about the broadcast end. Neural respectfully suggests that Telos/Omnia follow the same path.

Neural has recently started licensing decoder technology that is available *now*, that is compatible with *Neural's verified broadcast* technology. Licensing activity has been brisk, to say the least. Only recently has it been appropriate to disclose the technology to consumer organizations (like MPEG).

Mike, we appreciate your enthusiasm. Surround is an impressive listening experience and you've heard a system that delivers it on the FM band. So naturally, you want to get on with it! But you are proposing that broadcasters adopt a system that has had no significant on-air testing, no disclosure of technology, no comparative evaluation of performance, a single vendor source and troublesome claims.

As Mr. Pappas can tell you, he has performed significant on-air testing and the technology *has* been disclosed to him as he has taken the appropriate legal steps. His many years of broadcast and surround experience make him uniquely qualified to generate a meaningful opinion. The comments of "vendor problems" and "troublesome claims" seem more like "sour grapes" than reality.

"The MPEG system we support has been carefully tested in a controlled scientific fashion with a wide variety of source audio material. Its developers include Fraunhofer Laboratory (inventors of MP3 and MPEG AAC), Agere (former Bell Labs and Lucent researchers), Coding Technologies (inventors of the "plus" enhancements to MP3 and AAC as well as the HD Radio codec), and Philips (co-inventor of MPEG Layer 2 and a consumer electronics firm).

"Yet more testing is forthcoming as the best ideas continue to be merged from each contributor. The technology approach has been published in a number of AES and other papers so that researchers have been able to evaluate claims and build upon each other's work."

Neural started down the same (bitstream) path several years ago. There are aspects of a bitstream based surround system that are terribly cumbersome to the existing and future broadcast infrastructure. That path was *rejected* by the broadcaster; it doesn't matter where the technology came from.

Neural is delivering a tested, scalable, future-proof and *reliable* system that may be implemented into the existing infrastructure without costing the broadcaster an arm and a leg. It *does* work and it works *very well*.

Telos/Omnia has had a long-standing invitation to come to Neural to enjoy surround and salmon. What are they waiting for?

Reams is chief technology officer and co-founder of Neural Audio Corp.

RW welcomes other points of view.

New Nautel AM
Digital Transmitters

nautel

Stay on the air
With power to spare

XR12
12 kW AM Digital Transmitter

Quick Specs

- RF Output Power – 12 kW (rated)
  15 kW (capable)
- 145% positive peak modulation at 12 kW
- 1.5:1 VSWR at 12 kW, 100% modulation
- Dual hot-pluggable power modules and redundant standby module
- Dual DDS exciters with automatic changeover
- Plug and play integration with Nautel's NE IBOC AM HD Radio signal generator
- Built-in power preset scheduler allows for six preset power levels
- XR12 dimensions: 28.5" W x 72" H x 39.5" D
- New 25 kW and 50 kW XR transmitters also available

The fourth generation of Nautel's 12 kW AM transmitter provides unparalleled performance and reliability, and supports both HD Radio™ and DRM digital radio. The modular XR12 is over-engineered to allow aggressive signal processing and up to 145% positive peak program modulation at 12 kW, producing more sideband energy and a stronger effective signal. The XR12's reserve power capacity also makes it ideal for simultaneous, full power AM analog and digital service.

The XR12's two power modules and one standby module automatically maintain full power even under fault conditions. Power modules are hot-pluggable and can be removed and replaced without any interruption in service. For even greater redundancy, the XR12 includes a complete standby DDS exciter and modulation encoder that automatically takes over when it detects a problem.

A 240 x 60 LCD graphical user interface, advanced alarm system, 128-event log and on-board real-time clock make operation, troubleshooting and system monitoring easy.

This combination of redundancy, in-service repair, automatic fault recovery and sophisticated alarming makes the XR12 the most robust digital AM transmitter available today.

HD Radio™ Pure Digital. Clear Radio.

drm

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Multicast

▶ Continued from page 1

generated from the data services associated with IBOC, such as multicasting, may be the return on investment stations are looking for to recoup their investment in digital equipment.

Still to be determined is whether the commission would apply ownership or programming restrictions to supplemental channels. But its action was regarded by observers as a signal the FCC would not prohibit the general concept. Supporters, NPR in particular, they said, could use the development as a "carrot" to entice receiver makers and other HD Radio data gear and software vendors.

However, an agency official was careful to point out to Radio World that the FCC is endorsing neither HD Radio nor the multi-channel concept, but rather facilitating them.

Nor has the commission restricted the type of stations that may choose to split their digital signals, thus leaving the option open for commercial, non-commercial and even AM stations, should they like to try the concept — although most experts believe FM frequencies are more suitable for the lower bit rates involved.

"NPR and public radio stations have embraced the digital transition and we eagerly await formal approval of expanded HD operations in the next several months," said Michael Riksen, vice president of NPR government affairs.

In a Public Notice in March, the commission noted that "several" public radio stations have tested the concept.

"We ... recognize that the extremely encouraging Tomorrow Radio test results establish the feasibility of multiple audio transmissions in the hybrid mode," stated the agency.

Total testing costs were estimated to be "several million dollars" by the partners when testing began.

CPB funded the original four market test programs with $500,000 and a second $700,000 grant last summer to document the quality achievable with multiple music and voice program channels, host compatibility using extended hybrid carriers and expanded data collection to support propagation and coverage predictions.

Boston Acoustics and Kenwood plan to have HD Radios on the market this spring that support supplemental digital channels. Kenwood predicts availability this month.

NPR doesn't have an exact count of how many stations are multicasting digital signals, although Mike Starling, vice president of engineering and operations, listed several FMs, including the initial four Tomorrow Radio test stations: KALW, San Francisco; KKJZ, Long Beach, Calif.; WETA, Washington; WNYC, New York; as well as four others, WAMU, Washington; WOSU, Columbus, Ohio; KUOW, Seattle; and KAZU, Pacific Grove, Calif.

"We expect a strong number of applications to come into the FCC based on (the) announcement, probably in the dozens," Starling said.

NPR, Harris and Kenwood partnered on the Tomorrow Radio concept, supported by their own money and funding from the Corporation for Public Broadcasting.

For its stations that have multicasting authority, NPR is finalizing a test collection package for producing detailed coverage maps, similar to data collected for the first phase of the Tomorrow Radio project, Starling said.

"The data will be instrumental in quantifying the coverage tradeoffs associated with adjacent-channel stations and terrain anomalies."

Boston Acoustics and Kenwood plan to have HD Radios on the market this spring that support supplemental digital channels. Kenwood predicts availability this month.

Starling said NPR received five responses from receiver makers to its recent request for proposals for multichannel radios for a potential 50,000-unit group purchase. The network hopes to make a selection by June.

Grants, coverage

NPR planned to ask CPB to include transmission equipment needed for multichannel, such as the so-called Gen 2 exporter and importer, in its digital conversion funding grants.

Harris and Broadcast Electronics have said they're ready with products to support multi-channel.

To apply for an experimental authorization, stations may file an informal application, such as a letter. The FCC staff normally approves such requests within a week, the agency said.

NPR has a sample request form on its engineering Web site at *www.euonline.org*.

"Given that the rollout is somewhat gradual, the FCC shouldn't be too overwhelmed by these requests," predicted Rich Redmond, director of broadcasts systems for Harris. "It's not like 10,000 stations are going on tomorrow."

While NPR had hoped the commission would expand the current digital notification procedures to include multicasting, the agency said that doesn't fall within the current IBOC Report and Order allowing interim operation in the hybrid mode.

The commission expects to include more particulars about multicasting in a subsequent item on IBOC, due out later this year.

"A blanket STA would have been better because it would have removed the word 'experimental,'" said a source close to the issue. "We have long ceased calling Tomorrow Radio experimental. But experimental authority is the only mechanism the FCC has without jumping through hoops to do this."

HD Radio Show Roundup

by Leslie Stimson

More news has trickled in since Radio World queried major HD Radio vendors in the last issue about their exhibit plans at NAB2005 and how they believe the digital radio rollout is going.

BE READY FOR SPLIT CHANNELS

Broadcast Electronics said it will be able to deliver product to support stations that want to split their digital signals into several channels. BE made the announcement after the FCC clarified that stations can seek experimental authorization to multicast with the HD Radio technology (see page 1).

The product manufacturer says its new line of HD Radio data importers would ship to stations by late April. The importers can support several digital channels, according to BE. The data importer splits HD Radio bandwidth between the main program service and supplemental channels, along with supplemental program-associated data. The IDi software encodes the supplemental channel audio and multiplexes it with the PAD and other data to be carried on the HD Radio signal.

The resulting bitstream is delivered via Ethernet to BE's XPi 10 data exporter, where it is combined with the encoded HD Radio main program stream and its data for transport to the HD Radio exciter and transmitter.

Two models are being offered. The IDi 10 provides a fixed, 32 kbps SPS channel with no bitstream provisioning. The IDi 20 offers flexibility in managing the HD Radio system throughput for multiple SPS. On release, the IDi 20 is limited to two secondary program channels; future updates will expand the number of SPS channels supported.

BE has reconfigured its product line featuring an integrated exporter and signal generator into one unit, which the company claims makes it possible for customers to move HD Radio generation to the studio at any time in order to be ready for second-generation IBOC transmission architecture without adding an exporter box to their air chain.

In the past, stations purchased an FXi digital exciter plus an FSi 10 HD Radio generator for the transmitter. Now BE will provide the exciter equipped with its Exgine card plus the XPi 10 exporter with signal generation functions for the same price as the FXi / FSi combo.

NAUTEL, CONTINENTAL SEE INTEREST SPIKE

Nautel President/CEO Scott Campbell sees interest in IBOC picking up among customers and credits Tomorrow Radio for that uptick.

"I think our customers need a good reason to do something. A lot of them are asking how they can increase their coverage. There's many markets where you can't add another FM station, so Tomorrow Radio" gives the listener a benefit, he said, due to the additional format choice if the digital signal is split.

Nautel plans to highlight the concept with a demo in its booth.

Separately, Continental Electronics, the fourth transmission company to license Ibiquity Digital technology, said the time was right to get into the IBOC game.

"We believe that our timing in the IBOC rollout is perfect as our plan has always been to wait until there is demand to start production," said Bret Brewer, broadcast marketing manager for the company. "With broadcaster requests on the table it's 'full steam ahead.'"

He said that as improved applications for digital radio continue to surface, "Continental's IBOC equipment will address the financial and technical opportunities that evolve."

The company plans to display gear for HD Radio, analog and Digital Radio Mondiale broadcasting.

WALKER UPPED AT IBIQUITY

And Ibiquity, the company upon whom all HD Radio vendors depend upon for the base digital radio technology, said it continues to direct its resources towards helping stations deploy the rollout.

The company expanded its broadcast business development unit, adding Tom Walker to a staff run by Scott Stull, executive director of Broadcast Business Development.

Walker will monitor the rollout and work with stations to maximize digital operations. He has been a broadcast engineer with Ibiquity for five years and was previously with Continental Electronics and DOE for Patterson Broadcasting.

DIGITAL NEWS

Canadian Interest In Sat Radio Gauged

OTTAWA Nearly one-fifth of Canadians, or up to 4 million people, would express an interest in subscribing to a Canadian satellite radio service within the next year if it were to become available. That's according to survey results from research firm Decima, which polled 2,000 people in February on behalf of Canada's two satellite radio applicants, Canadian Satellite Radio, of which XM is a partner, and Sirius Radio Canada.

Decima said the applicants have estimated that the Canadian economy will receive a boost to the tune of $2 billion over a decade should the government approve satellite radio.

It's unclear from results that were released whether hardware costs were explained to participants.

Eight percent of Canadians, according to the results, said they plan to subscribe to a U.S.-based satellite radio service within the next year if the Canadian government does not license satellite radio in Canada, which translates to 2 million Canadians.

Digital Radio Express Debuts FMeXtra

by Leslie Stimson

SAN JOSE, Calif. Digital Radio Express will be at the NAB show promoting a system it says presents a new approach to digital broadcasting in the FM band.

The company, one-time partner of the former USA Digital Radio, is displaying the FMeXtra encoder at NAB2005 in the Armstrong and Bext booths, and presenting a paper in the Broadcast Engineering Conference. DRE is licensing its technology to receiver manufacturers; it says one company has plans to ship an FmeXtra-capable receiver in coming months.

DRE expects more than 100 stations broadcasting with FMeXtra by mid-year. By the NAB show, it said, the device will be in use at one station, and several stations have been testing the encoder in San Francisco, San Diego, Los Angeles and St. Paul.

DRE has loaned the encoders to several stations for testing, said Dwight Taylor, managing director of the company, who declined to give specifics, citing confidentiality agreements. The company has interest from more than 100 stations now, he said.

The company says by combining its FMeXtra with advanced audio compression technology, such as aacPlus from Coding Technologies, it can digitize the subcarrier portion of the FM baseband so a station can deliver multiple channels of high-quality audio or other data services.

A station could use the technology to split its subcarrier spectrum into many signals, and deliver separate channels of programming and data, and could do so immediately, before the facility converts to IBOC, according to DRE. No transmitter or antenna modifications are required to install FMeXtra, the company says.

A station would need to purchase an encoder from DRE and install it before the transmitter. The DRE encoder installs into the input port of an exciter, the port meant for an external SCA signal, said Taylor.

FMeXtra is compatible with hybrid IBOC, so stations making the digital conversion can also use FMeXtra to add data capacity to their analog broadcasts.

DRE claims the product will not interfere with or affect a station's ability to go IBOC. While compatible with hybrid IBOC, the DRE system uses FM subcarriers that would not be available to an HD Radio station that goes all-digital and turns off its analog FM. Taylor and digital radio experts predict that day is many years away.

The idea of splitting the subcarriers into several digitized channels builds on the Tomorrow Radio idea, said Taylor. "This is compatible with IBOC. You can use the 96 kilobits-per-second of data on the FM IBOC channel and have another 64 kilobits on top of that" by digitizing and splitting the SCA signals.

By using the extra data capacity made possible by the technology, a station could deliver more programming, real-time video clips, telematics data and other services, said Taylor — regardless of whether a station has gone HD or not.

The amount of bandwidth available for FMeXtra's SCA signal depends upon the individual station's configuration — whether it is broadcasting mono audio or stereo audio, and whether there are existing SCA signals. Stations with tenants on existing subcarriers can use FMeXtra but at a reduced data rate.

"They won't want to be analog tenants in the future," and DRE can help stations migrate those tenants to digital, said Taylor.

Even stations with fully occupied SCA frequencies can take advantage of the DRE technology, the company claims. Taylor said the encoder allows such stations to split up their SCA signals differently, squeezing out more bandwidth for data services.

In a typical stereo FM signal, FMeXtra can use the spectrum between 53 kHz and 99 kHz, according to the company.

The older RDS SCA signal contains only about 700 bits per second, a very low data rate. By comparison, DRE's FMeXtra technology embeds up to 64,000 bits per second in stereo configurations, Taylor said.

To hear the programming or other services on the subcarriers, listeners would need receivers that can decode the digitized subcarrier signals. FMeXtra radio receivers will be based on ST Microelectonic's digital radio chip set TDA 7580 and TDA7515.

Rikei Corp. is acting as a go-between with receiver manufacturers. The first FMeXtra radios were set to be available at the end of the first quarter, DRE said. Rikei will determine the best configuration for the first models, such as analog/FMeXtra or analog/FmeXtra/IBOC, for example, to gain the widest possible market distribution, he said.

Taylor said there is no incremental cost to the manufacturer to add the DRE capability to an HD Radio, and a small incremental cost to add the capability to an analog radio.

The FMeXtra receiver design can be combined with Digital Radio Mondiale radios and other devices that include radios or devices that could benefit from long-range wireless remote access, such as the Nokia Visual Radio, according to DRE.

Workbench

Radio World, April 13, 2005

Past columns are archived at *www.rwonline.com/reference-room*

A Pillbox Is a Healthy Addition

by John Bisset

Don't you hate to lose or misplace parts when you are disassembling equipment? Joe Stack has a cheap solution. Joe is a frequent contributor to this column, always ready with a great idea that will improve your efficiency as an engineer. His latest submission is no exception.

The seven-day pill organizers that you can pick up in the dollar store are handy during disassembly of a device for storing small parts and hardware in the proper order. Referring to the photo, replace the days of the week with stick-on numbers or letters. Flat washers, lock washers and nuts can be put in the separate compartments in the order they were removed from a pc board mount.

This way, the parts can be put back in the correct order. Perhaps this organizer can be used if someone takes apart a tuning or loading control coupling shaft or even a tube socket mount. A lid on each of the seven compartments keeps the contents from dumping out.

In the past, Joe has drawn a diagram of an assembly and, on the drawing, added the letter of the compartment that contains the proper hardware. Beats trying to figure it out later.

Thanks, Joe. I've seen engineers use muffin tins to hold parts, but having the snap-on top to keep the parts contained is an added feature.

★ ★ ★

Now that most of the nation is experiencing better weather for outdoor activities, AM directional RF proof measurements may be on your "to do" list.

Crawford DOE and RW contributor Cris Alexander offered a couple of great tips on your walk-in measurements. Like me, Cris has learned a few things from now-retired consulting engineer Charlie Gallagher.

A stickler for precision, one of Charlie's cardinal rules was to always pull the measurement rope in the same direction, so it runs along the ground like a snake from one measurement point to the next. This will expedite your close-in measurements. As you measure off each distance, don't try to pull the lagging end of the rope up to the next measurement point. This will form a big loop, snagging the rope and taking extra time to free the snags on bushes and brush.

Instead, have your helper mark the point at the leading edge of the rope, and then pull the leading end of the rope along like a snake, till the next measurement distance is reached. I've tried it both ways, and Charlie's suggestion works.

Cris recalls getting zapped during one set of walk-ins and offers this caution. The cotton rope was wet from the dew on the ground. The farmer who owned the adjoining land didn't appreciate the trespassers, and turned on the electric fence. As the rope draped over the fence, it made a pretty good conductor! Ouch! I'd heard of a similar shocking experienced with a wet rope getting too close to a high-power tower. (At least the measuring device wasn't a chain or long wire.)

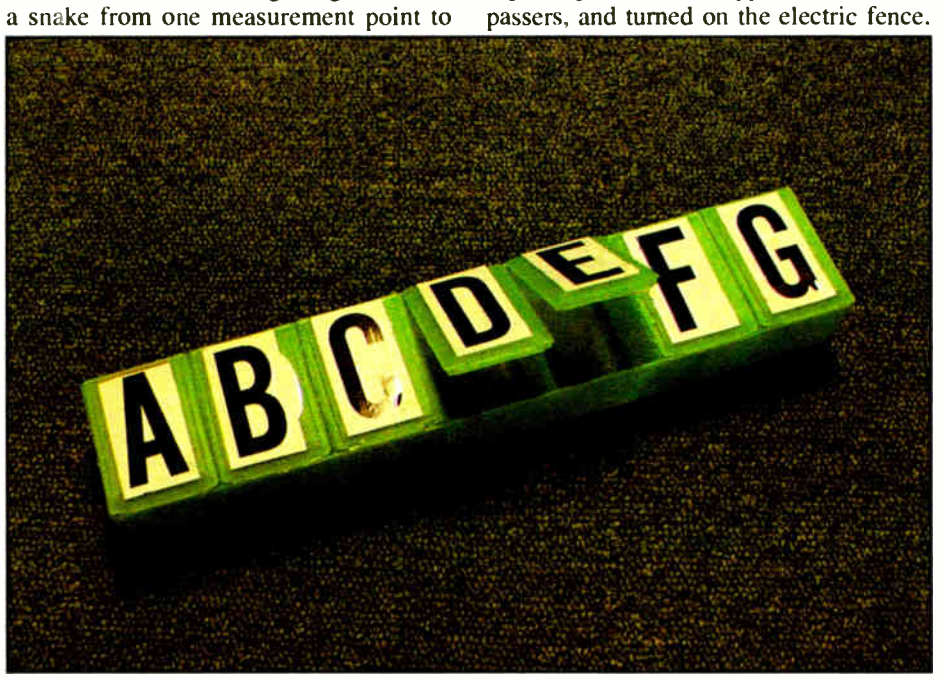

Fig. 1: A pillbox sorts small parts for easy reassembly.

Cris Alexander can be reached at *crisa@crawfordbroadcasting.com.*

★ ★ ★

The folks at Broadcast Signal Lab in Boston are among a growing number of firms providing HD Radio planning and installation assistance.

On their Web site, one of the principals of the firm, Dave Maxson, has posted a Kenwood radio application note and a companion Broadcast Signal Lab note on using a special mode in the Kenwood HD Radios to time align analog and digital audio transmissions.

If your plans call for HD Radio, or if you've already converted, you'll want to visit this site. Here's the address: *www.broadcastsignallab.com/digital.php3.*

David provided a great HD tutorial at last year's Maine Broadcasters Convention. Reach him at *dmaxson@broadcastsignallab.com.*

★ ★ ★

Although he admits he's not up on all the details, Arthur Graf, CE with KTIS(AM/FM) in St. Paul, encountered a similar problem to one outlined previously in *Workbench.* His station generator's output frequency floated around enough that the UPS would not accept its power output. Arthur's electrician dealt with this by adding a "frequency governor" of some sort to the generator. That modification cleaned up the generator's output frequency enough so that the UPS would accept the generator's power.

Art admits he's no electrician by any means, but he found our mention of "distortion of the sine wave output of the generators" interesting in light of some recent reading on troubleshooting power quality and power harmonics. Arthur questions the possibility of generators, transformers, etc. needing to be "derated" because of all the non-linear loads involved.

A lot of great power-quality articles can be found on the Fluke Web site. Go

See POWER QUALITY, page 22 ▶

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qual·i·ty *n.* the highest or finest standard.

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TECH TIPS

Site Security: Know Your Options

Modern Electronic Security Systems Can Do Much More Than Ring a Bell and Cause False Alarms

by Nick Markowitz Jr.

The author is contract broadcast engineer for WAVL(AM) in Apollo, Pa. He owns Markowitz Electric Protection.

Admit it. When you hear the words "security system," you think of old-fashioned burglar alarm bells and sirens going off, and a stream of aggravating false alarms at 3 a.m.

This may have been true in the 1960s and '70s, but today's electronic systems can offer so much more if you have a good alarm-installing company working with you to design what you need instead of trying to install a cookie-cutter system.

This unassuming hut is armed with a combination shock and contact unit by Ademco.

The unit uses wireless transmisson in the 350 or 900 MHz range to detect the hut door opening or vibration if vandal activity.

My company does this kind of work, and Radio World asked me to comment on the system choices available to radio readers.

A modern panel can comprise integrated burglar, fire, card access and environmental condition monitoring. One panel can offer 250 or more individual zone points of monitoring, and it can be controlled remotely and polled for information over dial-up phone lines, even the Internet in some cases.

Modern panels can send information by several methods, including dial-up signal to a 24-hour monitored central station. The latter can determine exactly which door or sensor has tripped by means of Ademco/Honeywell Contact ID format. The information can be sent from an alarm to the central station in under 10 seconds.

At the same time this information can be transmitted to a pager or cell phone, perhaps on the engineer's belt. It also can be sent over the Internet using TCP/IP to a central station; it can be sent over a backup cellular phone in case standard

See SECURITY, page 24 ▶

Power Quality

▶ Continued from page 20

to *www.usfluke.com*, go to Support and click on Application Notes, and choose Power Quality.

And there is a great article on troubleshooting power harmonics at *http://support.fluke.com/find-sales/download/asset/1260362_k_w.pdf.*

Thanks, Art, for offering such a great resource. Art Graf can be reached at *arthurgraf@hotmail.com.*

★ ★ ★

Dielectric's Matt Leland sent in an entry for the worst transmitter site road.

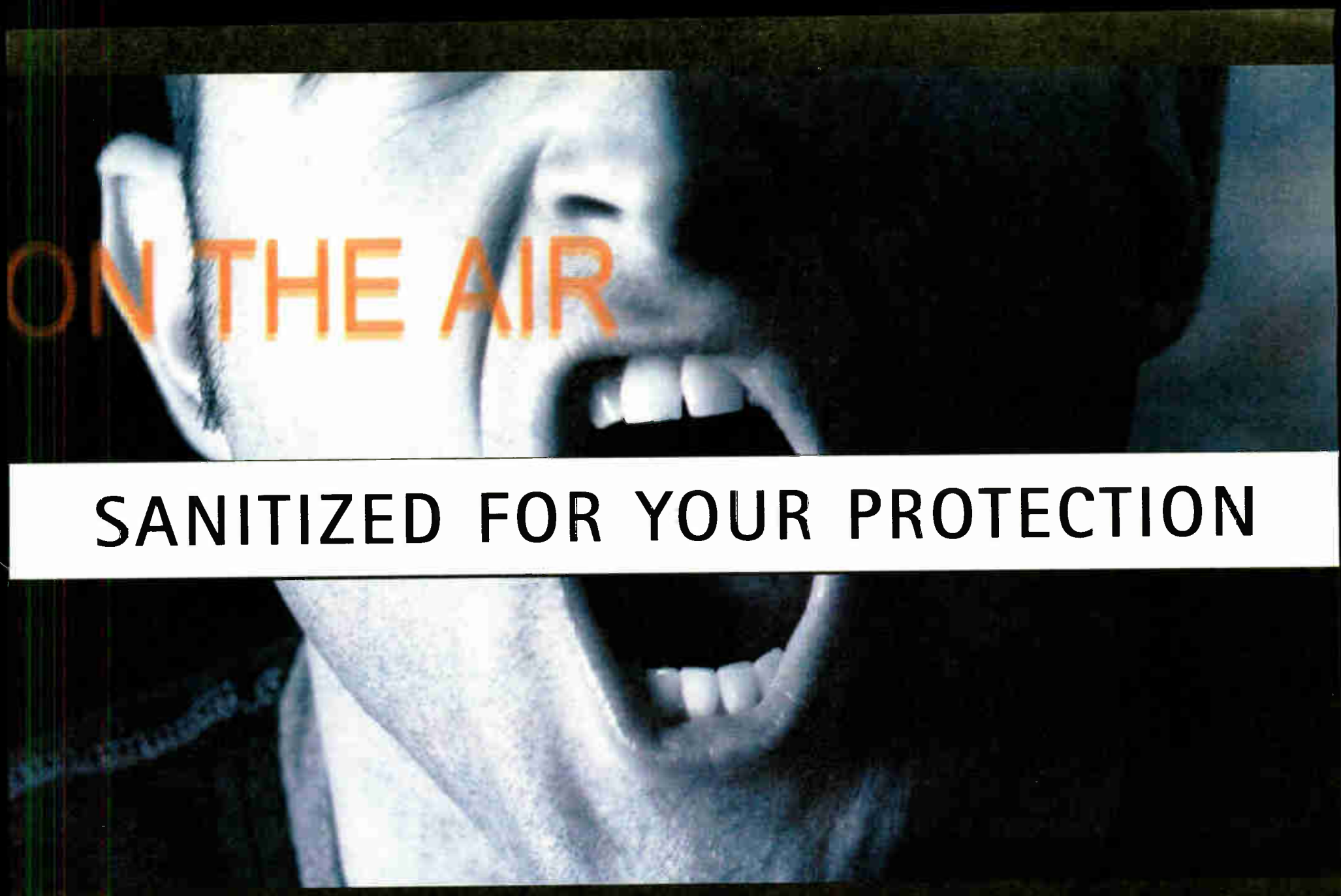
Seen in Fig. 2, it's a shot of the Cox Radio transmitter site in Hawaii. A beautiful location and view, but forget the road; access is via helicopter!

Matt Leland can be reached at *matt.leland@dielectric.spx.com.*

John Bisset has worked as a chief engineer and contract engineer for more than 30 years. He is the northeast regional sales manager for Broadcast Electronics. Reach him at (571) 217-9386, or jbisset@bdcast.com.

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

Fig. 2: Don't bother driving to this transmitter site.



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SOME WORDS SHOULD BE OBSCENE AND NOT HEARD.

Eventide Broadcast Delays are designed to keep profanity off your air and angry listeners, embarrassed advertisers and the FCC off your back. We invented the obscenity delay and have a solution for stations large and small that provides up to 80 seconds of the highest quality, revenue- and license-protecting delay.

Our new HD compatible BD600 24-bit delay comes standard with AES/EBU and provides up to 80 seconds of memory – twice as much as other delays. There are fully adjustable Delay and Dump functions, and a Sneeze function which "edits" audio entering the delay, allowing the host to sneeze, cough or make a short comment without being heard on air.

The BD600 offers two different methods of delay buildup and reduction: Eventide's patented catch-up and catch-down system and an exclusive fast-entry-and-exit feature which allows starting a broadcast with the delay already built up to a safe amount and ending it with a rapid reduction of delay.

For HD, the BD600 offers Precision Delay mode which allows the delay to be adjusted in 100 nanosecond increments, useful for synchronizing the analog signal with the digital signal for HD broadcast installations.

Whatever your size, whatever your format, you can't expect to protect the integrity of your air and the foundation of your business without an Eventide Broadcast Delay in your rack.

HD COMPATIBLE

Eventide®

Security

▶ Continued from page 22

phone or broadband lines fail.

If you can dream up an application to monitor, these combo panels can be programmed to receive the information and retransmit it to location of your choice. Modern panels are based on programmable logic controller technology, so entire scenarios can be programmed to operate as you wish.

Smart systems

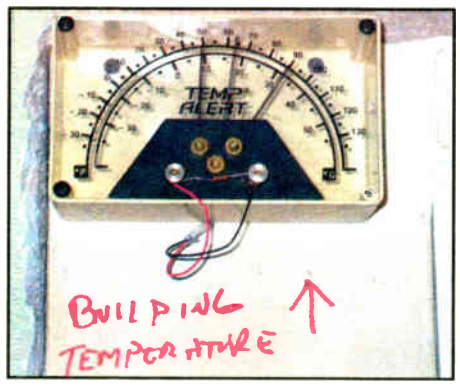
Consider WAVL, the little 5 kW AM station I maintain in Apollo, Pa.

I started by using Cat-5 wiring for the hardwire part of the alarm system, to help keep RFI from getting into the system. I used good surge protection, into which the wall-wart transformer plugs, as well as surge protection on the incoming phone line.

The station system monitors its doors with wide-gap contacts, which allow up gaps of up to 3/4-inch, preventing falses even if a door starts to warp or bow. There are dual-technology motion sensors in place that will ignore small animals, a frequent cause of false alarms, yet detect intruders.

Glass-break detectors are in place should an intruder try to break one of several small windows in the building. These can recognize glass breaking but ignore other noises.

Enclosure holds the control that monitors tower light power.



A high- and low-temperature alerting unit, manufactured by Winland.

Control keypad for the system has voice capabilities and announces what is going on in the alarm.

In addition, using modern wireless technology in the 350 or 900 MHz range, wireless units on my transmitter huts detect the hut door opening and detect vibration if vandals are trying to break in or damage the huts. The wireless transmitters use lithium batteries, good for up to seven years; these units too are supervised by the main panel. If a unit does not see the test signal, it sends a message to my pager and the central station indicating a problem.

The system has jamming alert technology should someone try to compromise the wireless transmitters. They have a range of 1,000 feet, so outbuildings, studio vehicles in the parking lot and other assets can be protected without having to run wires everywhere.

Smoke and heat detectors in the main building provide for protection from fire; a carbon monoxide detector is in place as well.

Safe and dry

WAVL's security system includes several high/low temp sensors that warn of equipment problems, as well as sensors that will warn if water is leaking from a broken pipe or the roof near the transmitter equipment.

The tower light controller warning is tied to the system, as is a sensor that warns if we lose one of the phases of the three-phase power. You also could monitor your backup generator's fuel tank and operational condition.

I plan to add a card access unit that uses Prox technology to open doors. This approach is more sophisticated than the old mag stripe, "slide the card" technology. No physical contact is required; just wave your wallet in front of the vandal-resistant reader and the door opens. Or you can use a simple key fob.

The station system automatically records time of entry and the name of the person; it records when the alarm system is turned on and off — all system activity is logged in a memory of up to 1,500 events. If someone forgets to arm the system, no sweat; the system can be controlled over a phone line, by phone or computer; it can be armed and disarmed remotely and doors opened and closed, allowing tower crews or others entry without having to give out keys and codes.

Imagine how handy that is when you have multiple parties renting off your tower.

Motion penalty

Also of interest, speaking of towers: Special outdoor motion sensors are available that can be wired to a system or wireless transmitter to warn that an intruder has entered your fenced-in tower boundary or attempted to climb your tower.

What if an intruder is successful in cutting the phone lines to stop the alarm signal from even being sent? Several systems can get the signal out using a dedicated radio frequency or cellular backup unit, which uses the control channel technology.

Remote video surveillance is easy. Cameras can be viewed in real time directly over a computer from anywhere over a dial-up phone line or via broadband connection, if available; wireless cameras and remote transmission are available so you can set cameras at the site and send a microwave signal directly back to the studio for real-time viewing — great for when the big storms roll through.

When it comes to site security, if you can dream it up, a properly trained integration technician can design and install it for you.

In short, if you can dream it up, a properly trained integration technician can design and install it for you. False alarms can be kept to an absolute minimum, even with storms, high winds and power surges.

There is a large amount of technology available, off the shelf, that can be used to protect your assets. It just takes the time to research the products available and participation of a good contractor who is willing to put the time and effort into designing what you want.

Nick Markowitz Jr., N3MJS, founded Markowitz Electric Protection in 1978. The firm handles electrical and electronic work for commercial, industrial and nonprofit clients.

The author's Web site includes installation tips and links to manufacturers: www.securitymission.com.

Radio on the Road to Las Vegas

From Howard Hughes to 'The Drive,' Highway Radio Keeps the High Desert Tuned In

by Scott Fybush

If you've ever driven from southern California to Las Vegas, you've probably noticed something about the radio dial once you cross over the mountains and into the desert.

There's not much there.

But as empty as the dial may sound in 2005, it was even quieter three decades ago, when a young marketing executive for the legendary Howard Hughes came up with the idea for what would eventually become Highway Radio.

Captive audience

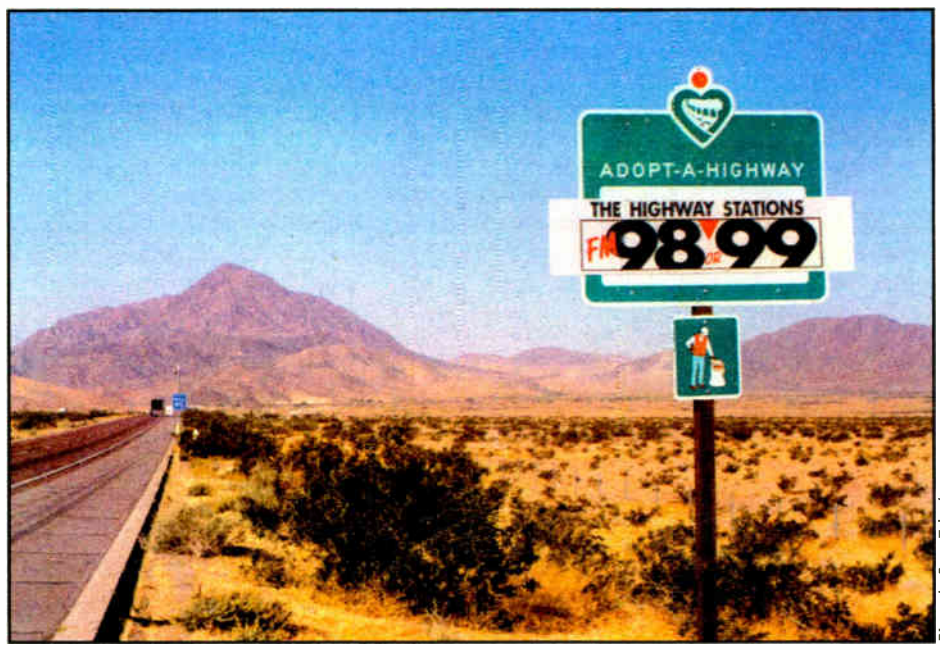
"There was no FM service anywhere on the highway," recalled Howard Anderson. "It was a white area."

Hughes is best known today for his money, eccentricities, womanizing and adventures in the air. But the mogul had broadcast interests, too, having owned Las Vegas' KLAS(TV). And he owned several casinos, including the Desert Inn.

Back then, Anderson was the casinos' vice president for marketing, with a keen interest in broadcasting stoked by a career that began at Salt Lake City experimental TV station W6XIS and included time at Dallas' WFAA(TV), ABC and Twentieth Century Fox TV before joining Hughes' organization.

"We knew there was a microwave relay station that KLAS had used on Calico Peak, outside of Barstow," Anderson said, noting that a signal from that site would reach most of the I-15 freeway between the California/Nevada border and the fringes of the Los Angeles area.

Anderson also knew that nearly half of all Las Vegas casino customers at the time came from southern California — and that the cost of advertising on Los Angeles radio stations was prohibitive.



Photos by Scott Fybush

A natural fit: the Highway Stations participate in the Adopt-a-Highway program, and their signs are visible on 150 miles of I-15 and I-40.

"We knew if we could get (casino patrons) when they were already destined to Las Vegas, we'd have a very effective advertising medium," Anderson said. With their inside knowledge of the casino world, the station's planners determined that if they could get just 5 percent of the Las Vegas casinos' advertising budget, "we could crack our nut."

Life after Hughes

Not long after Anderson had drafted a business plan for a chain of radio signals serving the I-15 corridor, Hughes died. For the next two years, Anderson's attention was focused on getting Hughes' Summa Corp. stabilized and sold off. But after reopening the Desert Inn in October 1978, Anderson returned to the radio plan that he'd concocted for Hughes.

This time, he was ready to try getting it on the air himself.

In addition to the signal from Calico Peak — for which Anderson applied using the tiny community of Yermo, Calif., as city of license to avoid tipping off AM stations in nearby Barstow to the impending competition — Anderson wanted a second signal to serve drivers on the eastern portion of I-15, from Baker to the Nevada border and down into Las Vegas.

Finding a transmitter site in the mountainous area wasn't hard, but finding a city of license in the sparsely populated desert was another matter. The likeliest candidate was the town of Mountain Pass, Calif., population barely in double digits. Yet it had a post office and a grade school, since closed — and it had Anderson selling his case to Wally Johnson, then head of the FCC's Mass Media Bureau.

"We persuaded him that people on the highway, because they had common interests, needs and problems, constituted a community themselves," Anderson said, and by the end of 1979, he was the proud holder of two high-power FM construction permits serving a whole lot of desert.

"Yermo and Mountain Pass," Anderson recalled, "what kind of a fruitcake thinks he's going to make any money off those?"

"The Highway Stations," KRXV(FM) 98.1 Yermo and KXVR(FM) 99.5 Mountain Pass — the "XV" in the calls came from I-15 — signed on in 1980, initially offering a format meant to appeal to fans of Vegas-style entertainment.

"It was mostly featuring the artists who were appearing in Las Vegas at the time," Anderson said, "Tony Bennett and Frank Sinatra."

From that humble start, the service grew, first with a power boost for the Mountain Pass transmitter, which required a waiver to exceed Class B maximum facilities; this the FCC granted on the grounds that it would better serve the station's mobile "community" of listeners. Later came the 1991 debut of a third transmitter on Goffs Butte, 30 miles west of Needles, Calif. That signal served the I-40 corridor, of increasing importance with the rise of Laughlin, Nev., as a gaming destination.

The Highway Stations' studio, top center, overlooks Barstow Station.

Covering the highway with signal was one thing, though. For the Highway Stations to succeed, they had to get advertising. With most of its audience in cars, and almost none of them living in the stations' "home market," that was quite a challenge.

"Arbitron hasn't a clue as to how to measure in-car listening," Anderson said.

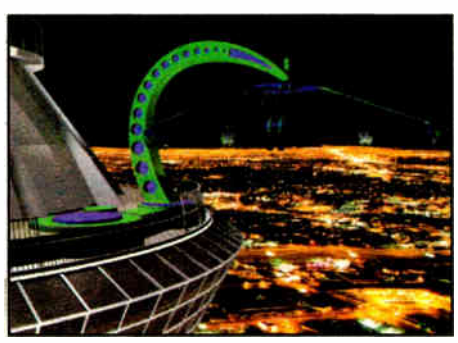
So after blanketing the highways with promotions for the stations, the Highway Stations had to hit the road to find out who was listening.

"We do intercept research along the highway," Anderson said, "and we find that we deliver about a 35 rating and an 80 share."

But the proof is in the results. After boosting the power of the Mountain Pass transmitter, Anderson approached the owner of the casino at Primm, Nev. — the first casino drivers pass as they cross

See HIGHWAY, page 28 ▶

When Losing Money Isn't Thrill Enough



The fourth and final thrill ride at the top of the Stratosphere tower in Las Vegas is open.

"Insanity-The Ride" is an inverted centrifuge that spins 10 passengers out over the edge of the tower at 40 m.p.h. and pulls 3 Gs. You're 900+ feet up and propelled up at a 70-degree angle. It is shown here in an artist's rendering.

The casino's general manager was quoted in press material as saying, "Well, you'll have to be nuts to even think about getting on it."

The Stratosphere also has the "Big Shot," "High Roller" and "X Scream," the latter of which opened in 2003.

Pix are at *www.insanityride.com.*

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JBL's 4408As are staples of the broadcast industry. Quality components and circuitry produce smooth, accurate audio monitoring. 8" woofer and 1" tweeter. Sold as each (left or right).

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MTC52 Ceiling mount (pr) $135.00

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OC White ProBoom Elite Mic Boom w/Riser

The OC White ProBoom Elite heavy-duty boom holds any microphone quietly in position, hiding the cable and improving appearance. The base provides a wire channel through the riser which is prewired to a built-in XLR female jack with 3 feet of pigtail from the base for the user to wire as needed. Premium music wire springs are used, for silent use. BSW just bought a large quantity of these premium booms especially for our broadcast customers. Only at BSW!!

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The 72010PKG is a great deal for any studio or live need, delivering 5 boom stands and a padded nylon bag. Incredible price at BSW!!

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This studio boom features removable casters on a 22 lb. base and extends from 40" to 82", almost 7 ft.! The boom arm slides effortlessly and locks with a tension knob.

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XLR & 1/4" TRS in, fan cooled. SLA1 List $279.00

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Here is affordable Belden speaker cable in 100 ft. roll. 16 AWG. 5200UE-100

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HURRY! Special Offers in this ad expire 5/31/05!

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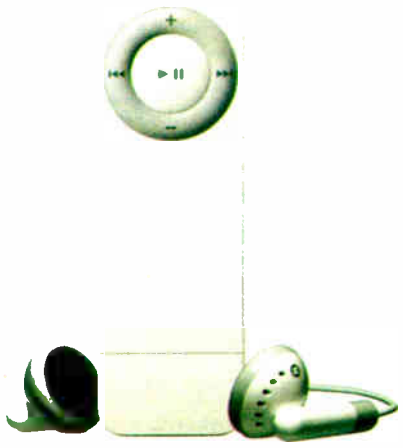
Time for 'Survivor,' NAB Style

by Jackie Broo

If you're into reality shows, you've probably watched "Survivor," where a group of backstabbing "ordinary people" are taken to some exotic location to perform strange physical challenges.

When you stop to think about it, isn't the NAB Spring Show a lot like that? We're all transplanted to fabulous Las Vegas and asked to stand on our feet for 8 to 10 hours a day for at least four days and/or walk miles of corridors. Then in end, we all get kicked off the island and have to leave.

Outwit. Outplay. Outlast.



Can't stand the floor noise? Got a long way to walk? Maybe the Apple iPod shuffle music player will help you pass the time.

The following are tips and insights to help you survive NAB and hopefully make your show experience that much more rewarding and productive.

Dealing With Skepticism — The first challenge for any prospective attendee is, of course, dealing with the derision from co-workers and family when you tell them, "Going to Las Vegas is no picnic; it's lots of work." Change that skepticism by showing everyone your itinerary and meeting appointments. Let them know that you have to cover an area that encompasses over 2 million square feet.

What to Bring? — I subscribe to the theory of not enough. I have been known to bring staplers, paperclips, back-up software CDs, cables (USB, Ethernet, phone wire), extra computer battery, AC adapters (phone, computer, PDA, etc. or a universal adapter available at Radio Shack or Sharper Image). Office Depot has four Vegas locations and OfficeMax seven; they have most anything you need in a pinch. Kinko's, Walgreens and CVS carry a limited amount of office supplies.

What to Wear? — Hurdle No. 3 is not looking like a total loser. Unfortunately for the fashion-challenged, there is no dress code at the NAB.

When it comes to attire, think casual dress-down. A polo shirt and khakis are good choices. And pack a jacket or raincoat with a lining; once the sun goes down in the desert it cools down considerably.

OK, this is one of those "duh" suggestions, but it bears repeating: Forget your Jimmy Choos and take a couple of pairs of real comfortable shoes. And make

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Highway

▶ Continued from page 26

the Nevada state line — to advertise.

The client "was skeptical at first ... but he came on board," Anderson recalled, and within three years, business at Primm had increased 300 percent.

Within that time, the Highway Stations also had achieved their initial goal of taking in 5 percent of the Vegas casinos' ad budget. As a privately held company, Highway Radio doesn't release its financial figures, but Anderson says the stations are solidly profitable and thoroughly unique.

"We do not see any other location where this would work," Anderson said.

Anderson says there's plenty of evidence that the ever-growing traffic along I-15 is paying attention to his signals. If an announcer makes a mistake when promoting a room rate, Anderson says, the station's phone is ringing "within 45 minutes," as drivers show up at the casinos asking for the incorrect rate.

Unlike traditional radio, there's no drive time at the Highway Stations, either. Casino advertisers aren't very interested in anything before 10 in the morning, Anderson says. So his stations do a morning show that's aimed at local listeners (and advertisers) in Barstow, the commercial hub of the High Desert, and later in the day they depend on cume to get their advertisers' message out to an audience that's constantly coming and going along the highway.

"If any advertiser comes to me and says, 'Give me seven spots a week,' we say 'No, that's foolish,'" Anderson said.

On the air

The Highway Stations' on-air presentation has changed since the days of Sinatra and Bennett. Today, listeners to the three signals hear adult contemporary music, but with some features few other stations offer. Most important, says Anderson, is the 24-hour traffic-report service, with constant repetition of the stations' toll-free hotline to report traffic problems.

The stations feed Metro Traffic, Anderson said. "Many times we know about accidents and problems before the Highway Patrol does."

In addition to the main Highway Stations service, Anderson's interstate empire, now known simply as Highway Radio, today includes two more formats.

Five years ago, Anderson bought out a new competitor, three lower-powered signals called "Highway Country." Three years ago, Anderson won two more FM licenses and put them on the air as "Highway Rock, the Drive," appealing to a younger audience.

While the newer services are mostly automated, the presence of a live DJ 24 hours a day on the Highway Stations means listeners to all three formats get immediate updates whenever there's an accident or a weather problem on the highway. Anderson says that, in turn, gives the stations something that CDs or satellite radio can't offer drivers.

"We take very seriously the principle of localism," he said.

Promoting the stations is a challenge, as well. Anderson says he's had particular success with the "Adopt A Highway" program. More than 150 miles of I-15 and I-40 are now dotted with "Adopt A Highway" signs promoting the three services. The stations also have two vans that travel the highways, making frequent appearances at casinos and at rest stops along the road.

To serve its advertisers, Highway Radio maintains a sales office in Las Vegas, where its sales staff holds frequent breakfasts to keep the casinos updated on traffic counts, construction and other issues of special importance to their mobile "community" of listeners. (The stations also distribute a monthly newsletter on their Web site to spread that information.)

And if you get off the highway to stretch your legs at the Barstow Station restaurant/gift shop/bus terminal that beckons weary drivers off I-15 near the junction with I-40, be sure to look up from the racks of T-shirts and snow globes and other trinkets. The Highway Stations' offices and studios are right up there on the second floor, overlooking both the tourists downstairs and the audience that's constantly coming and going on the highways below.

Scott Fybush (www.fybush.com) tunes in the Highway Stations every year on the way to Las Vegas for NAB.

Surviving NAB

▶ Continued from page 28

sure you break them in before you go to the show to save on nasty surprises like blisters.

What Gadgets to Take? — If you want to make a real statement, you won't show up with just any cell phone or PDA. You want to flash a sleek, ultra-thin Motorola Moto Razr V3 cell phone that features quad-band international, wireless and Bluetooth capabilities and a camera. This is one of those gadgets that will attract a lot of attention and create major phone envy

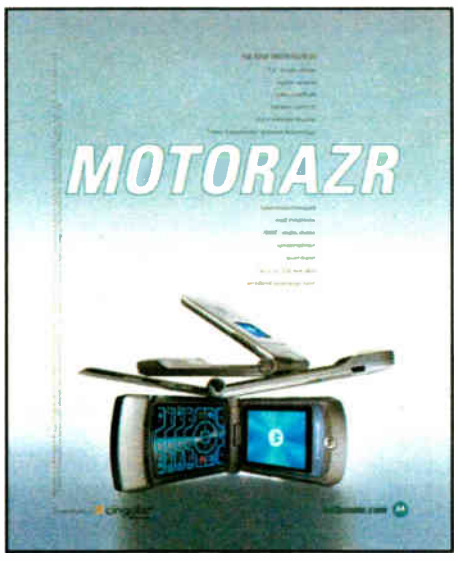
Low-end PalmPilots are so yesterday; your best bet is something that multi-tasks. BlackBerry 7290 (e-mail, PDA, world phone, wireless, Bluetooth) or the palmOne Treo 650 smartphone (world phone, Bluetooth, camera, MPEG3 player, e-mail, PDA) are popular with road warriors. These "must haves" also eliminate a number of gadgets that you have to bring with you.

While on the subject of insanely cool gadgets, the new Apple iPod shuffle MPEG3 Player doesn't eliminate extra equipment, but it is an incredibly small, portable way to bring a sampling of your music along. And like its bigger siblings, the unit can act as a backup hard drive for data (larger iPods have PDA capabilities for scheduling, reminders and address book).

Finally, for those into espionage (you know who you are), a digital camera comes in very handy.

Staying in Touch With People Back at the Office — Most people at the NAB will need to check their e-mail from time to time.

For savvy travelers with wireless cards for their computers, the NAB will be providing free wireless (WiFi) connections at the restaurant in the South Hall. The Convention Center offers "pay as you go" WiFi service through a third party, but be forewarned that it was overwhelmed at the 2005 Consumer Electronic Show. McCarran International Airport features free wireless service.



Walking the floor can be a bit more fun if you can show off a new toy like the Moto Razr V3 with digital camera, video playback, external color display and Bluetooth. But it still won't rub your feet.

Coming and Going — Speaking of McCarran, the Las Vegas airport is pretty easy to navigate. Baggage claim is pretty efficient. Unfortunately, everything comes to a screeching halt at the taxi line. Plan on spending at least an hour in line. Bring a book to read, listen to your iPod or strike up a conversation with your fellow taxi waiters. I had a fascinating conversation with a member of the adult film industry when I was in town in January.

Got a group? Split a van or limo.

And remember when you are leaving Las Vegas that thousands of people are doing the same thing. Build in plenty of time for a wait in the security line.

Transportation to the Convention Center — A long-time NABer likes to say that everything appears closer when you are in Las Vegas. Buildings that look blocks away are not. Hoofing it from Luxor to the Hilton could take you the better part of a morning and subtract lots of time from the show.

NAB shuttle busses to the show are convenient, but if yours is the last stop in the afternoon, you'll face a long bus ride in a cramped space back to your hotel.

The bus from the convention center to the airport is reasonable. If you have a place to stash your stuff at the show after check out, it is worth looking into.

Taxi lines at the end of the show day are ridiculous. Find a friend with wheels.

This year, NABers will no doubt be trying out the new Las Vegas Monorail — assuming it's running.

Dos and Don'ts

✓Do check in at your company booth.

✓Do treat your body right. A 19-year NAB veteran and long-time PR maven says that her advice can be summed up in one phrase, "Good shoes, ChapStick and water!"

✓Do get a map and plan ahead. An audio sales representative suggests downloading the NAB floor plan before you get to Las Vegas to create a plan of attack; pick one up at the door to check on changes. With more than 1,400 exhibitors, this can save time and help you cover more ground.

✓Do take time out for frequent short breaks and to eat lunch. Admittedly, the food isn't four-star at the convention center, but everyone needs to refuel. Better yet, grab a client and go out to lunch. Or step out into the sun and fresh air (one international traveler suggested sunglasses because the sun is bright when you emerge from the windowless convention center).

✓And don't forget: What happens in Vegas, stays in Vegas.

Where to Eat in Las Vegas

You've Scheduled Your Show Floor Visits And the Sessions. Now for the Serious Stuff

by James Careless

Ah, Las Vegas during NAB: The chiming of the slot machines (in the key of C); the R-rated taxi ads (everywhere) and the walking (endless).

There's nothing fellow and former NAB delegates can do to save you from this fate, but they can suggest some good places to eat. Radio World asked several to recommend places to eat.

For endless food on a budget, The Mirage's **Cravings** buffet is a favorite of Doug Thompson, director of engineering for Minnesota Public Radio.

"It's a very nice buffet that features unique themed 'islands,' each with different kinds of food such as Asian, Indian, Chinese, American and seafood," he said. "The quality of the food is really good; the atmosphere is fun and bright; the service is good, and the price is reasonable." According to the Web site *www.vegas4visitors.com*, Cravings charges $12.50 per person for breakfast, $17.50 for lunch, $20.50 for Saturday and Sunday champagne brunch and $22.50 for dinner.

"Chains get slammed but there's no reason to diss **PF Changs**," said Pat Meier-Johnson, owner of the PR firm Pat Meier Associates. "The service and variety are great and there are a couple of convenient locations. The one off Paradise might be easier to get into than the one on the Strip." PF Chang's prices are "moderate," according to *govegas.about.com*.

Another Pat Meier dining suggestion is **Buzios** at the Rio. "Brazilian seafood doesn't get any better than this! Good service, good food and the floor show in the main part of the casino — a floating Mardi Gras parade — is one of the best freebies in town." Buzio's entrees range from $20 to $60, according to *lvindex.com*.

Chef Julian Serrano of Picasso

Fun and funky

If you're nostalgic for the Rat Pack's Las Vegas, then you will want to take David Haydu's advice and check out **The Pepper Mill**, just across from the Stardust on the Las Vegas Strip. "The Pepper Mill hasn't changed in 40 years," said CHUM Radio's director of engineering. "It's where Sinatra and the Rat Pack would go for coffee. It's got that classic 1950s look, with classic American cooking." According to *www.realeats.com*, "The prices are very reasonable. The food is great. You will not walk out hungry."

"After a long night of partying, The Pepper Mill stands ready to serve 'hair of the dog' and a sumptuous breakfast," added Meier. "You'll find showgirls, locals and tourists all enjoying huge portions and friendly service."

Another fun and funky place is the **rumjungle** at the Mandalay Bay Hotel, according to Sophie Lion-Poulain, operations & communication manager for Audemat-Aztec Inc.

"We went there on the last day of the NAB show without knowing where we were," she recalled. Once there, Lion-Poulain found the rumjungle to be a "Brazilian/all you eat dinner with all kinds of meat, very exotic. The food was decent, the music was good and the atmosphere was great.

"Then, after 11 p.m. the restaurant turned into a huge disco," she said. "Girls were hanging in cages and dancing like crazy: It was so surprising! This is a very strange and fun place!"

In fact, the rumjungle is a popular Vegas nightclub that serves food during the quiet hours. Prices are described as moderate.

Fancy!

"I don't go to Vegas that much," said Tim Martz, president of the nine-station Martz Communications Groups. However, when he's in town, Martz is partial to haute cuisine.

Among his favorites are The Bellagio's **Picasso** and the Venetian's **Valentino**.

"Picasso is outrageously expensive but incredible food, service and decor in the midst of walls covered with original Picasso works," he said. Meanwhile, "Valentino is very expensive but has amazing northern Italian cuisine, a wonderful wine list and excellent service. It is the offspring of the great, original Santa Monica restaurant."

As for prices?

"Figure $100 a person at a minimum, and $200 a person is not impossible" at Picasso, said *www.cheapovegas.com*. "This joint is for folks who are really, really trying to impress someone."

The same site characterizes Valentino's prices by saying, "This is yet another super-high-priced Italian restaurant." But hey, you're in Vegas, baby!

Got a Vegas fave? Tell us about it at radioworld@imaspub.com.

NAB Crystal Finalists

Fifty radio stations are finalists for NAB's 2005 Crystal Radio Awards competition, which recognizes outstanding commitment to community service.

KBBX Omaha, Neb.
WHAI Greenfield, Mass.
KCLY Clay Center, Kan.
WHUR Washington
KEEY Minneapolis
WILV (WNND) Chicago
KEZA Fayetteville, Ark.
WJBC Bloomington, Ill.
KFDI Wichita, Kan.
WJJY Brainerd, Minn.
KIKV Alexandria, Minn.
WJON St. Cloud, Minn.
KLBJ(FM) Austin, Texas
WKHY Lafayette, Ind.
KLOS Los Angeles
WLEN Adrian, Mich.
KMXZ Tucson, Ariz.
WLQT Dayton, Ohio
KNIX Tempe, Ariz.
WMMX Dayton, Ohio
KNOM(AM) Nome, Alaska
WMZQ Washington
KOIT(FM) San Francisco
WNNX Atlanta
KOZT Fort Bragg, Calif.
WQCS Fort Pierce, Fla.
KRRO Sioux Falls, S.D.
WQRB Eau Claire, Wis.
KSAN San Francisco
WSB Atlanta
KSL Salt Lake City
WTAM Independence, Ohio
KTCK Dallas
WTCM(FM) Traverse City, Mich.
KTWB Sioux Falls, S.D.
WTMJ Milwaukee
WBAB Long Island, N.Y.
WTMX Chicago
WBEB Philadelphia
WTOP(AM) Washington
WCMT(AM) Martin, Tenn.
WTVN Columbus, Ohio.
WEZL Mt. Pleasant, S.C.
WUGO Grayson, Ky.
WFLA(AM) Tampa, Fla.
WUSL Philadelphia
WGSQ Cookeville, Tenn.
WWKI Kokomo, Ind.
WGY Albany, N.Y.
WWZZ Washington

Finalists will be honored and winners announced at the Radio Luncheon on Tuesday, April 19.

Radio's New Venues and Ventures

The Big Picture

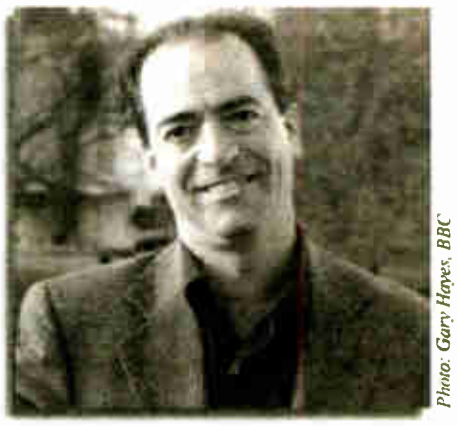


Photo: Gary Hayes, BBC

by Skip Pizzi

The Audience Is Changing. Can Radio Keep Up?

by Skip Pizzi

In our previous two columns we've been considering the future of radio in a multi-platform environment. This implies that radio broadcasters may deliver their services over multiple delivery paths, including but not limited to traditional over-the-air broadcasting.

To summarize, two major points need to be understood in this effort: 1) Content can flow over numerous, simultaneous real-time services (e.g., on-air and online); 2) Content can be delivered in both real-time and on-demand modes.

Both of these concepts are understood and in use by some broadcasters today, so this is nothing brand new. But it will become increasingly important that these concepts move beyond corporate posturing to permeate the very DNA of broadcasters' technical- and business-model strategies in coming years.

Three (or more) dimensions

From an audience-centric perspective, the multi-platform use of radio services should first be considered in terms of place. The three traditional venues for audiences' broadcast content consumption are *fixed*, *mobile* and *portable*, with the fixed venue further subdivided into "home" and "workplace" environments. A listener's choice of platform will depend strongly on which of these venues the listener occupies *at the moment*. For example, off-air listening might be preferred by a listener while at home, but online listening might be chosen by that same listener at work, and so on.

For terrestrial broadcasters, a fourth "modern" venue option can be added, which we could call *remote* or *distant*, in which a listener who lies beyond the reach of over-the-air reception can access broadcasters' (and others') streaming audio services via online service (including through wireless means). This is sometimes referred to as *expat* (for "expatriate") listening — i.e., former local listeners seeking a favorite station from elsewhere.

Each of these venues must be weighed by broadcasters when considering multi-platform distribution. Audience metrics and cost-per-listener-hour can vary widely among them, of course, making such comparisons occasionally complex. Also the competitive environment will likely differ in each (e.g., there are far more potential competitors in the Internet radio world than in any local over-the-air environment).

Importantly, consider also that this mapping of listeners' platform choice to their locations will be a fluid one as time and technology progress. For example, while listeners in today's mobile and portable venues will almost always choose real-time, over-the-air delivery, this may not be the case tomorrow. New products already on the market can allow a car audio system to sync via WiFi to a home media server when parked within range of the home network access point, allowing podcasts to be transparently delivered to the car. In the near future, converged wireless/broadcast systems could allow access to real-time streaming services on car or handheld devices, which will radically change the competitive landscape for terrestrial (and satellite) radio operators.

How to compete

Of course, any such new service will gather audience gradually, as Internet and satellite radio are doing today. The key distinction here is that if operators of these new delivery methods choose (or are constrained through regulation) to act as "pure" service providers, then their offerings will be treated as commodities, and chosen only on the basis of availability and price. In that respect, it's hard to beat over-the-air broadcasting's value in its local markets.

Yet if the pure service provider can provide better availability/price to certain audience segments, broadcasters may choose to make arrangements to offer their content on the service, and then use their legacy channels (i.e., over-the-air signals) to cross-promote the new service's offerings.

Today's Internet radio is an example of this, in which a broadcaster's streaming content can thereby be delivered to a limited amount of additional audience. Podcasting does the same thing, by extending both the spatial and *temporal*

See NEW VENTURES, page 32 ▶

New Ventures

▶ Continued from page 31

axes of selected broadcast content's availability.

On the other hand, if a new service provider also generates its own new and competitive *content*, a wholly different analysis must follow. Rather than the "if you can't beat 'em, join 'em" approach used above, broadcasters should take a "fight fire with fire" methodology here, taking on the competitor head to head, and offering equally or more compelling content and value than the new entrant. An example of this is satellite radio, where terrestrial radio should react with more content, increased localism and fewer commercials, as some forward-thinking broadcasters have begun to do.

There will always be a period in which the critical mass of audience already assembled by incumbent terrestrial broadcasters can be leveraged, but this time window is always ticking away, and its ultimate length is determined by the popularity and "buzz" of the new service. The latter is often short-lived, however, and the onus of maintaining it is usually on the new entrant (and its checkbook). Nevertheless, complacency of the incumbent can be dangerous, and market forces render that time-to-critical-mass window dynamic; it can shorten or lengthen quickly as the "buzz balance" for or against new or legacy services changes.

Podcasting extends both the spatial and temporal axes of selected broadcast content's availability.

Finally, although buzz is driven by promotional efforts, much of it can also come simply from the industrial design of consumer terminal devices, as we've recently seen with the iPod and similar products. Broadcasters have no direct hand in this component of the media ecosystem, but they should marshal any possible forces at hand to promote the incorporation of IBOC — and any other new reception systems that they might wish to leverage for delivery of their content — into desirable new devices. (For example, several new car audio units will bundle IBOC reception with MP3 and WMA playback capabilities.)

Along these lines, however, broadcasters should also realize that because many of these new devices will include increased convergence (i.e., incorporating numerous reception systems and playback formats), even the handheld device will become a more competitive environment than ever before. Promotional efforts should be tuned to compensate appropriately.

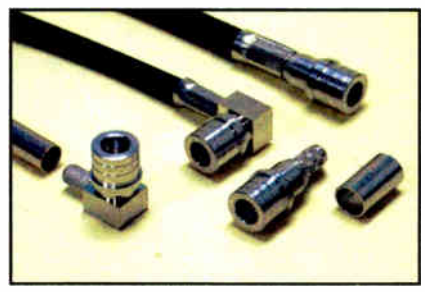
Radio has shown resilience before, reinventing itself on numerous occasions. Now is just another one of those opportunities for the medium to shed its old skin and revitalize. Competitive threats have never been stronger, but new venues of access to audiences have never been more exploitable.

Skip Pizzi is contributing editor of Radio World. Tell us your view. Write to radioworld@imaspub.com.

MARKET PLACE

QMA Connectors Mate Quickly

The RF Connector division of RF Industries has QMA series connectors that have a snap-on interface and needs no tooling for mating and unmating.



The connector features a sliding snap-lock mechanism that works by sliding the shell back and releasing to lock both connectors in place. This eliminates space between connectors needed for tooling. After they are mated, the QMA connectors can be rotated 360 degrees. Designed to mate with all QMA jacks, the company says they offer good electrical performance up to 6 GHz.

The QMA is available in straight and right-angle body styles and feature albaloy plated brass bodies, Teflon insulation, spring copper alloy outer contacts and gold plated pins.

The series is available with crimp-on attachment for RG-58/U and LMR-195 cable (RQA-5000-C straight, RQA-5010-C right angle), and RG-8/X and LMR-240 cable (RQA-5000-X straight, RQA-5010-X right angle).

Info: call 800-233-1728 or visit www.rfindustries.com.

MARKET PLACE

Comrex Looks to Internet Delivery, 'Inevitable Change' In Codec Use

Broadcast audio over the Internet is going to be an important theme for Comrex at the NAB show.

The codec manufacturer said it will present a technical paper on its new BRIC Technology; the paper is subtitled "Responding to the Changing Telecom Industry With Reliable, Real-Time, Broadcast Audio Delivery on the Public Internet."

VP Kris Bobo and Technical Director Tom Hartnett made the announcement, saying they see BRIC as an important new approach to the way live audio is delivered.

"Due to changes in the existing telephone infrastructure, this technology is likely to replace current ISDN and POTS audio codec transmission methods within the next 3 to 5 years," Hartnett said.

"Already broadcasters have reported situations where the phone company would no longer install ISDN lines," Bobo stated. "We feel it's important for broadcasters to understand what's happening as early as possible in order to prepare for this inevitable change."

Comrex also will roll out a new codec, the Access, and called it the "first wideband audio codec to work reliably over most data networks including the public Internet." It uses the BRIC technology and lets the broadcaster use a variety of Internet access points to broadcast high-quality, real-time audio. These include wired DSL, cable, POTS and Frame as well as wireless circuits like Wi-Fi, 1XRTT, EDGE and 3G data networks, Comrex said.

"Additionally, using the public Internet to reliably deliver real-time audio could represent vast cost savings and convenience for remote audio delivery."

Hartnett will speak on Tuesday, April 19 at 5:30 p.m. as part of the "Leading Edge Technologies" Engineering Conference session.

The codec will be available in rackable or portable versions. The company said it can provide voice connections over IP connections and also has a high-quality stereo mode for use on managed data networks.

Information: www.comrex.com.

How to Submit Letters

Radio World welcomes your point of view on any topic related to the U.S. radio broadcast industry.

Send letters via e-mail to *radioworld@imaspub.com,* with "Letter to the Editor" in the subject field; fax to (703) 820-3245; or mail to Reader's Forum, Radio World, P.O. Box 1214, Falls Church, VA 22041.

Switchcraft Adds FireWire Connector

Switchcraft is offering a FireWire connector that is mounted within a universal style XLR panel receptacle housing.

The new product has feed-through connections and can be supplied in nickel or black XLR housings. Other options in the line have BNC, RCA Phono and SVHS connectors; the company said USB and CAT-6 versions are planned.

For information visit www.switchcraft.com *or e-mail to* intsales@switchcraft.com.

Chapter Two

One balmy Cleveland evening, the Telos and Omnia gang were relaxing when someone asked a blue-sky question: "What do you think the radio station of the future will be like?"

The ideas flew. "Computers will send digital audio right to the mixing bus," said one engineer. "Information, too." "No more sound cards, distribution amps or cable bundles," said another. "No more expensive routing switchers, either. Everything will be simply networked," said a third, "and all the audio devices will talk to each other using low-cost stuff from the computer world." "They'll probably be broadcasting in surround sound by then," piped one. "Consoles will be fully integrated with phone and codec gear, and will be much more flexible!" offered another.

Waitjustaminutehere!" came a voice from the corner. "We could do all of that today! We could use Ethernet, and it would be quick to set up and easy to use. You could network dozens of studios, or whole buildings with it. And it would cost a lot less than any other all-digital system. I'll bet broadcasters would love it!"

The engineers got very excited and decided to turn their ideas into reality. Tirelessly, they toiled. Immense quantities of pizza, Chee-tos and magical elixirs were consumed. Finally, they were ready... but how would the world react?

Good news! The system they brought to NAB was a success! Broadcasters swooned. The press were impressed. Early adopters adopted it.

Meet Axia, the newest division of Telos. Axia is all about making radio studios better. Another happy ending! Or is it just the beginning?

Stay tuned for more...

AXIA
AxiaAudio.com

Telos
AUDIO | NETWORKS
TelosSystems.com

Omnia
OmniaAudio.com

USER REPORT

Neumann Has Head for Surround

The Company Says the KU-100 Dummy Head Mic Is Suitable for Radio Drama, Live Audio Recordings

by Mike Pappas
Chief Engineer
KUVO(FM) Jazz 89

DENVER We came upon the **Neumann** KU-100 stereo dummy head microphone while recording the Count Basie Orchestra in 5.1 surround at the University of Michigan Ann Arbor. Neumann suggested we try it for rear channels and we like the results we have gotten.

KU-100, we ran a series of tests evaluating various types of rear channel microphone techniques.

We set up the KU-100, spaced pairs of omnis, cardioids, MS and XY and recorded them to our Genex 9048 forty-track Direct Stream Digital recorder. We played it back and for what we are looking for out of the rear channels, image localization and detail, the clear winner was the KU-100.

The KU-100 effectively recreates the way you hear, complete with the frequency response compensation that occurs in your ear canal.

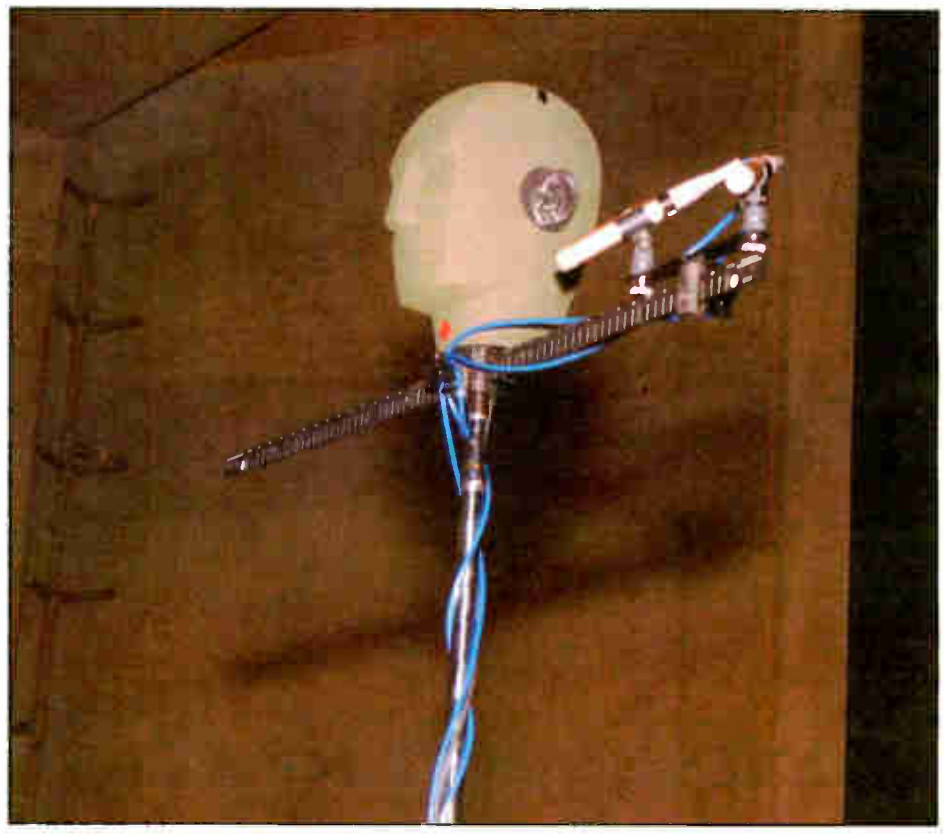
The KU-100 resembles the human head and has two mic capsules built into the ears. It is the latest in a series of Neumann stereo dummy heads dating back more than 20 years, starting with the KU-80.

Significant research of the development and characteristics of stereo dummy head microphones was done by the IRT and Neumann, and much of this early research found its way into the first generation of the KU series of microphones.

Our use of the KU-100 has primarily revolved around using it for the rear channels on surround recording and broadcasts. Before we purchased our

We put the KU-100 on a three-meter pole and start at the front of the stage with it facing the back of the hall. Then we walk toward the back of the venue while listening. At some point during the walk we find a point where the KU-100's sound gives us what we are looking for, and we either fly or place it on a mic stand at that location.

Height depends on the venue and how much audience resolution you want, and can range from three meters to nine meters or so. For the NPR New Year's Eve broadcast, the KU-100 was at five meters high and halfway back in the hall. At the KUVO performance studio, which is 36 deep by 24 wide, with a 17-foot high ceiling, the KU-100 is located 3/4 of the way back and low at 1.5 meters.



KUVO puts the KU-100 on a three-meter pole and hunts for a spot with good sound.

Stage presence

The KU-100 effectively recreates the way you hear, complete with the frequency response compensation that occurs in your ear canal. The mic gives us a rapid method for creating rear channel 5.1 surround ambiance with outstanding localization and realistic sound stage.

It has additional applications as a conventional stereo mic for radio drama, miking percussion, choirs, chamber orchestras, classical music and small ensembles, or just about any application for which you would consider using a conventional stereo mic.

The KU-100 features a low noise floor and high SPL capability with built-in pad and two low frequency roll-off positions. It runs off 48-volt phantom power, internal batteries or an external AC power supply, which is supplied, and it has both balanced mic level on a 5-pin XLR and unbalanced outputs on BNC for acoustical testing.

Neumann's KU-100 retails for $8,199. For more information, contact the company in Connecticut at (860) 434-5220 or visit www.neumannusa.com.

TECH UPDATES

Behringer Has B-1 Mic, VX2496 Preamp/Processor

Behringer's B-1 large diaphragm mic features a one-inch capsule and a wide-frequency response from 20 Hz to 20 kHz, which the company says is enhanced by a pronounced presence boost, making equalization unnecessary.

Highlights include cardioid polar pattern, switchable high-pass filter and -10 dB pad, SPL of 148 dB and low inherent noise. The B-1 comes with a carrying case, shock mount and windscreen, and retails for $119.

The Ultravoice Digital VX2496 is a mic preamp/voice processor based on the VX2000 preamp. VX2496 features analog and AES/EBU output, digital output up to 24 bit/96 kHz with selectable sampling rates or external clocking; opto compressor; dynamic enhancer; expander; de-esser and tube stimulation.

Also included is a ULN mic/line input stage with soft mute +48 V phantom power. Tube emulation circuitry provides for typical tube and tape saturation sounds, and an RMS expander enables noise reduction.

The company says the opto compressor provides inaudible dynamic control and creative signal processing options, and the voice-optimized equalizer was designed for voice enhancement.

The VX2496 retails for $129.

Additionally, Behringer offers the C-2 studio condenser mics, sold as a matched pair. Features include a low-mass diaphragm for wide frequency response and sound reproduction. The cardioid pick-up pattern eliminates feedback, and the low-noise transformerless non-tube input eliminates low-frequency distortion.

Behringer's Truth B2092A is an active 360-W studio sub-woofer for mono, stereo and surround applications, and will soon be available. The unit's 360-W amplifier delivers dynamics with linear bass reproduction down to 32 Hz.

Two long-excursion eight-inch speakers have a deformation-resistant aluminum die-cast chassis, which the company says is designed to reduce distortion to a minimum. The B2092A features dedicated left, right and center XLR inputs and outputs for stereo and surround applications.

The band-pass filter enclosure enables dynamic response and linearity, while active crossovers at 80 Hz provide frequency band separation and minimal phase shift.

Phase and Room Compensation controls enable flexible adaptation to most acoustic environments.

For more information, including pricing, contact Behringher USA in Washington state at (425) 672-0816 or visit www.behringer.com.

Brauner Ships Phantom V Non-Tube Mic

Brauner Microphones began shipping its Phantom V variable-pattern, non-tube (FET), large-diaphragm mic, which the company says builds on the Phantom C fixed cardioid FET model. The most recent addition to the Phantom series offers switchable, omni-directional, cardioid and figure-eight polar patterns, as well as a -15 dB pad.

The company says customers have enjoyed the Phantom series' aural character, but lacked the ability to use the features in acoustic settings where non-cardioid pickup patterns were necessary. Phantom V allows engineers to use the qualities of the 48 V-powered predecessor alongside augmented polar pattern choices and a -15 dB pad for higher SPL environments.

Phantom V was designed by Dirk Brauner, and features a satin nickel finish. Phantom V's capsule is based on the Brauner VM1 tube mic, and touts a self-noise of 8 dBa, a max SPL of 142 dB at 0.3 percent THD and a frequency range of 20 Hz-22 Hz. The Phantom V package comes with the Brauner shockmount suspension system, aluminum case, cable and user manual. It retails for $2,650.

For more information, contact Las Vegas Pro Audio at (702) 307-2700 or visit www.lasvegasproaudio.com.

TECH UPDATES

Sennheiser Has Avantgarde Headphones

Sennheiser Electronic Corp. says professional recording is a suitable application for the HD 600 Avantgarde open-dynamic headphones.

The advanced diaphragm design eliminates standing waves in the diaphragm material. The open metal mesh earpiece covers are intended to provide transparent sound while computer-optimized magnet systems minimize harmonic and intermodulation distortion.

The headphones offer transient response as a result of voice coils in lightweight aluminum. The neodymium ferrous magnet systems provide optimum sensitivity and a wide dynamic range.

The detachable OFC copper cable is Kevlar-reinforced, with low handling noise. Finished in black or gray, the HD 600 comes with a 1/4-inch stereo jack plug. The headphones retail for $450.

Sennheiser also offers its MD 421 II large diaphragm, dynamic mic, which the company says evolved from the MD 421. It features a cardioid pattern, five-position bass control and is suitable for recording guitars and drums.

For more information, including pricing, contact Sennheiser in Connecticut at (860) 434-9190 or visit www.sennheiserusa.com.

beyerdynamic M 58 Has Internal Shockmount

The M 58 dynamic omnidirectional interview mic from **beyerdynamic** is suitable for electronic newsgathering and electronic field production applications. The company says the mic offers an extended frequency response with rising high end for intelligibility, and the internal shockmount reduces handling noise.

Features include a high-output moving coil transducer, non-glare Nextel finish and a slim profile.

Accessories include the BMC 05 FM and BMC 10 FM XLR mic cables; MKV mic clamp for a shaft diameter of 19-32 mm; MKV 8 mic clamp for a shaft diameter of 22-32 mm; and the WS 58 WS wind screen.

The M 58 retails for $334.

For more information, contact Full Compass Systems in Wisconsin at (800) 356-5844 or visit www.fullcompass.com.

AT Offers Monitoring Headphones, Condenser Mic

Audio-Technica's line of Precision Studiophones includes the ATH-M40fs, which feature flat, extended frequency response for mixing and monitoring; field-replaceable cables, drivers and ear pads; and rotating earpieces for one-ear monitoring. Other highlights include 1,600 mV of power handling and high SPL capability, and 40 mm diameter drivers, neodymium magnets and CCAW voice coils.

The AT2020 side-address cardioid condenser mic from Audio-Technica, reviewed in the March 30 issue of Radio World, features a low-mass diaphragm for extended frequency response of 20-20,000 Hz, in addition to the ability to handle high SPLs of 144 dB. It retails for $169.

The company says the fixed cardioid polar pattern allows isolation of the desired sound source. Features include a wide dynamic range of 124 dB, and a pivoting threaded stand mount. The mic requires 48 V phantom power, which may be provided by a mixer/console or a separate, in-line source such as the AT8801 single-channel and CP8506 four-channel phantom power supplies.

Additionally, the AT2020 measures 6.38 inches long, has a maximum body diameter of 2.05 inches and weighs 12.1 oz. A protective carrying pouch is included.

For more information, including pricing, contact Audio-Technica in Ohio at (330) 686-2600 or visit www.audio-technica.com.

TECH UPDATES

Genelec Adds 8130A to MDE Monitor Series

Genelec Inc. added the 8130A to its 8000 MDE line of bi-amplified active monitors.

The Genelec digital monitoring system combines AES/EBU digital and analog inputs in one system, and features a 192 kHz, 24-bit digital audio interface in the aluminum Minimum Diffraction Enclosure (MDE) design with integrated Advanced Directivity Controlled Waveguide (DCW).

The 8130A supports single- and dual-wire digital input mode, and is compatible with Genelec's 7050A subwoofer. Additionally, it is possible to daisy-chain as many as eight 8130As in digital or analog mode.

The compact 8130A also incorporates automatic word-length and sampling frequency detection. The dispersion and stereo imaging capabilities of the 8130A make it suitable for near-field monitoring, remote vans, digital audio workstations, control rooms, surround sound systems, multimedia and computer soundcard applications.

The company says its rear-port design has substantially lowered distortion while bass response is 55 Hz (-3 dB). LF extension is sufficient for most monitoring situations, though it is possible to use the 8130A with the Genelec 7050A subwoofer for additional low-end response.

The 8130A has a five-inch bass driver and a 3/4-inch tweeter. Free-field frequency response is 58 Hz to 20 kHz (±2.0 dB). Peak SPL per pair is 108 dB, driven by a pair of 40-W amplifiers. The 8130A also has new crossover filters.

The 8000 series systems come with the Iso-Pod mounting stand, enabling monitoring with the speaker in either vertical or horizontal orientation. The Iso-Pod enables the user to accurately aim the acoustic axis of the monitor toward the listener, and mechanically decouple the monitor from the surface on which it rests. The 8130A retails for $995.

For more information, contact Genelec Inc. in Massachusetts at (508) 652-0900 or visit www.genelec.com.

Sony MDR7506 Has Closed Design

Sony's MDR7506 headphones are suitable for radio broadcast applications, in addition to electronic newsgathering and production sound monitoring.

The large-diaphragm foldable headphones feature a 40 mm driver unit for clear sound reproduction, and a closed-ear design to reduce external noise interference.

Frequency response is 10-20 kHz. Highlights include gold connectors and OFC cord for stable signal connection and transmission, and a protective case for storage.

For more information, including pricing, contact Sony at (800) 686-SONY (7669) or visit www.sony.com/professional.

Blue Mics Debuts Robbie the Preamp

Blue Microphones describes 'Robbie' as a Class-A discrete tube mic and instrument preamp with no switching crossover distortion in the balanced audio signal path, and 34 dB headroom before clipping.

The front has a large backlit potentiometer for gain, 1/4-inch hi-Z instrument input and enclosed vacuum tube. The rear has the power cable input; power switch; balanced XLR mic input and line output; polarity switch; and –20 dB pad.

The 1/4 high-impedance instrument level input is intended for direct injection of guitars, synths and drum machines with an instrument level output. A signal fed to the Instrument output appears at the Line output when the Mic/INST switch is depressed.

The SPST switch labeled +48 V activates Robbie's phantom power circuit.

For more information, including pricing, contact RVA Canada Ltd. in Toronto at (416) 299-6442 or visit www.bluemic.com.

TECH UPDATES

Blue Sky Monitors Suitable for 5.1

Blue Sky International says its monitors are suitable for stereo and 5.1 audio content creation, and are used in applications such as digital satellite radio studios. The systems use compact main speakers, combined with a subwoofer and specific bass management electronics.

The company says near-field or mid-field studio monitors traditionally are designed to be used without a subwoofer, and in order to get reasonable low frequency response, use ports or passive radiators.

"Most of these same monitor manufacturers also offer subwoofers that can be added to their systems, to extend the low frequency of their monitors," said Rich Walborm, chief technology officer for Blue Sky. "Unfortunately, because ported and passive radiator speakers have a complex gain and phase relationship around their cutoff frequency, it is difficult to get the main speakers and subwoofer to sum correctly.

"The result in many cases is users hear the sub and main speakers as separate speakers, not as a single, extended frequency response system," he said.

Blue Sky's main channel speakers are sealed box designs and have a cutoff frequency of 80 Hz with a 12 dB per octave roll-off. Included in the bass management electronics is an additional 80 Hz high-pass filter, which is inserted in line to give the speaker a 24 dB per octave high pass acoustic response. To reproduce the spectrum below 80 Hz, the bass management electronics take the direct feed from the main channels, sums it and then routes it through a matching 80 Hz 24 dB per octave low-pass filter.

The company says the summation of the acoustic output of the main channels and the subwoofer room results in a nice blend of the two. Because the directional cues are still coming from the main speakers, the ear perceives the bass as originating from the main channels and not the subwoofer.

For more information, including pricing, contact Blue Sky International at (516) 249-1399 or visit www.abluesky.com.

Klein + Hummel M 50 Acts as Control, Mix Monitor

Klein + Hummel North America says small studios and remote vans are prime applications for the compact M 50 monitor.

The lightweight, magnetically shielded M 50 measures 5 x 7 x 5 inches. Features include flat frequency response, which the company says makes it suitable for use either as a control monitor for live broadcast applications or as a mix monitor in smaller studio recording environments.

The M 50 is powered with a 12-V battery, facilitating operations in smaller remote vehicles. For stand mounting, there is a 3/8-inch threaded socket on the bottom panel.

The aluminum enclosure provides maximum interior volume while inner wall bracing adds stiffness and thus eliminates resonant colorations. These factors help the four-inch broadband driver deliver low distortion and flat frequency response across the spectrum.

A floating transformer-balanced input (+6 dBu) offers a common mode rejection ratio of more than 50 dB.

Volume adjustment is via a front-mounted knob, which can be removed to prevent undesired operation. The rear panel houses the power switch, AC power connector, fuse holder and 1/2-inch blade terminals for battery operation. Input is via an XLR connection.

For more information, contact Klein + Hummel North America in Maryland at (301) 888-2426 or visit www.klein-hummel-northamerica.com.

TECH UPDATES

Ultrasone PROline Headphones Use S-Logic

Ultrasone of America debuted its PROline series of headphones, which feature the company's S-Logic technology and protection from EMF radiation up to 98 percent. Also offered are detachable cables, both coiled and straight, a replacement pair of speed-switch ear pads and replaceable drivers.

The company says the design of the PROline 750, 2500 550 and 650 headphones allows a higher degree of transparency and spatial sense due to the higher degree of ear anatomy involved.

The S-Logic technology uses decentralized positioning to reflect sound off the listener's outer ear, which creates a three-dimensional sound without the use of processing. S-Logic produces a stereophonic surround sound field that is perceived to be broad, detached and located in front of the listener.

Ultrasone says S-Logic also reduces the risk of hearing damage, as the headphone's transducers are not aimed directly at the auditory canal. Listeners perceive the same volume with sound press levels at the eardrum reduced up to 40 percent.

Models 750 and 2500 uses titanium-plated drivers, which the company says enables an exact sound reproduction. The 750 has a closed-back design, the 2500 is open-back. Both have frequency range of 8-35 Hz.

The PROline 650 uses a 40 mm gold-plated driver, and offers a frequency range of 10-25 Hz. The 550 uses a 50 mm Mylar driver and offers a frequency range of 10-22 Hz. The series retails for $239-$399.

For more information, contact Ultrasone of America in Tennessee at (615) 599-4719 or visit www.ultrasoneusa.com.

Tascam Releases VL-X5 Studio Monitors

Tascam's VL-X5 studio monitors feature 5-1/4-inch woofers, silk-dome tweeters and a 60+30-watt biamplified active power amp. The monitors offer low- and high-frequency controls and an Acoustic Space Control to optimize performance for room placement and listener preference.

The company says the VL-X5's sound quality can be attributed to its components and how they work together. A one-inch silk high-frequency driver and a 5.25-inch low-frequency driver are coupled with 30- and 60-watt power amplifiers made for the VL-X5, enabling crisp highs and deep bass, Tascam says. Flat frequency response up to 22 kHz makes the VL-X5 suitable to perform as a mixing and mastering monitor.

The VL-X5s are shielded to prevent magnetic damage to CRTs. Users can place a pair of VL-X5s next to a DAW computer screen; the Acoustic Space Control allows the user to place the monitors against a wall or in tight studio corners.

Tascam says the deep cabinet and ported design produce a nice amount of bass for the size of the monitors.

For more information, including pricing, contact Tascam in California at (323) 726-0303 or visit www.tascam.com.

MXL V69, V6 Suitable for Broadcast Use

MXL Microphones, the professional audio division of Marshall Electronics, says while it does not market mics to the radio broadcast industry, its MXL V69 and V6 models are often sold to broadcasters. The mics are part of the company's Silicon Valve line.

The MXL V69 is a large-diaphragm tube condenser mic that offers low noise level and wide dynamic range. Accessories include a flight case, shock mount, dedicated power supply, Mogami 7-pin and XLR mic cables and windscreen.

The MXL V6 is a solid-state large diaphragm condenser, designed to produce the sound of a tube mic, as "solid-state mics typically deliver what is characterized as a 'transistor' sound, which is harsher and less open than the best tube mics," said a company representative.

The V6 uses an FET amplifier with balanced transistor output. This circuit is intended to reduce harshness created by odd order harmonics and musically unrelated distortions caused by a variety of components within the signal path.

Also offered from MXL is the Desktop Recording Kit (DRK), which consists of a professional cardioid condenser microphone, desktop microphone stand, microphone clip, XLR cable, XLR-to-miniplug adapter cable, 3.5 mm mini-plug-to-1/4-inch adapter and power source.

The company says the DRK is suitable for home recording enthusiasts seeking quality audio for vocal recording, capturing musical instruments, sampling and related tasks. The MXL microphone included in the kit is self-powered and works with external microphone preamplifiers, should one be available.

The Desktop Recording Kit keeps the audio within the audio spectrum, unlike USB-based microphones that require conversion of the audio signal. It includes the necessary accessories for integration into various recording environments. The DRK microphone connects to professional mic preamps, mixing consoles or computer audio interfaces via XLR cable.

The XLR-to-miniplug adapter cable enables connection to computer soundcards or other consumer audio equipment that use 3.5 mm miniplugs. The 3.5 mm miniplug-to-1/4-inch adapter allows the DRK microphone to interface with self-contained recording studios that commonly use the 1/4-inch phone plug standard.

For more information, including pricing, contact Marshall Electronics in California at (310) 333-0606 or visit www.www.mxlmics.com.

TECH UPDATES

Henry Engineering Has Multi-User Headphone System

Henry Engineering offers its MultiPhones Multi-user headphones system, which the company says provides DJs or in-studio guests with individual headphone listening stations.

The MultiPhones system consists of a Master unit and up to 12 Guest Pods powered from the Master. Each Guest Pod contains a headphone amplifier, volume control and headphone jacks. Both 1/4-inch and 1/8-inch jacks are provided. The system is connected using CAT-5 cabling. Up to 12 Guest Pods can be used with each Master.

Additionally, the system features a Talkback facility and a "cough button" for each guest's mic. The "cough button" and "mic-on" LEDs can be wired to the user's audio console or other equipment.

Various types of headphones can be used without interaction or adverse effects because each Guest Pod has its own amplifier. The company says there is no interaction between units and no degradation of audio performance, regardless of the number of Guest Pods used.

The MultiPhones Master unit is powered with an AC power supply. It occupies 1/3 rack width and can be mounted with the optional rackmount shelf, or cabinet or wall-mounted using optional cabinet/wall mounting brackets. The Guest Pods can be flush-mounted in a tabletop cutout, or mounted on a desktop or to a cabinet using the optional desktop enclosure.

The system uses low-Z balanced audio distribution so long cable runs do not affect audio quality.

For more information, including pricing, contact Henry Engineering in California at (626) 355-3656 or visit www.henryeng.com.

Quested Offers S6 Two-Way Active Monitor

The compact S6 from **Quested** is a self-powered, two-way active monitor that is magnetically shielded.

Applications include nearfield monitoring for broadcast, recording and mixing, programming, post-production and surround sound work. The output of the S6 makes the monitors suitable for use where high monitoring levels are required.

Extension of the low-end performance is made possible by combining the S6 with an SB series sub bass. Combined, the two products extend the frequency response down to 20 Hz. The S6 delivers an SPL of 104 dB.

There is an XLR and 1/4-inch jack combo socket. Sensitivity of -12 dBu to +6 dBu for 96 dB SPL at one meter is adjustable by means of a 10-position rotary switch on the rear panel.

The S6 measures 7 x 11 x 9 inches and weighs 16.5 pounds.

For more information, including pricing, contact Audio Intervisual Design Inc. in California at (323) 845-1155 or visit www.aidinc.com.

Upcoming in Buyer's Guide

May 13- Transmitters

June 8- Audio Processing

July 6- Consoles, Mixers and Routers

TECH UPDATES

Tannoy Updates Reveal Active Monitor

Tannoy says its Reveal D range of active nearfield monitoring speakers builds on its Reveal Active monitor but offers greater bandwidth, lower levels of distortion, smoother responses and more accurate phase control. The cabinets of the Reveal D models have been further braced and refined to provide a rigid platform for new driver designs.

Magnetic circuit flux control rings and Klippell-based symmetry analysis enable the bass driver to offer reduced distortion. The new drivers provide controlled bass response with an open mid range for vocal intelligibility.

The inclusion of the Tannoy WideBand high-frequency unit improved the open and detailed reproduction of mid-high frequencies, as it extends the high-frequency phase response. The company says this ensures increased tonal accuracy of individual instruments in the reproduction process.

A set of dipswitches on the rear control panel of the Reveal D active monitors allow the selection of a speaker response for difficult monitoring situations so the frequency response a the listener's ears is as linear and flat as possible.

The Reveal 5A also builds upon the Reveal Active, offering a smaller cabinet in addition to a rigid platform for new driver designs.

Features include 40 mm contoured baffle, neodymium soft-dome tweeter, extended HF phase response and front-mounted LED status indicator. Front-mounted volume control and rear-mounted AC power isolation switch also come with the 5A.

For more information, including pricing, contact Tannoy North America at (519) 745-1158 or visit www.tannoy.com.

O.C. White ProBoom Facilitates Wire Integration

The 61900 ProBoom series from **O.C. White** includes the Elite mic arm, which features gold-plated, soft music wire springs and hidden compartments.

The company says the mic boom arm is designed for quick wire integration by means of a zip-lock top. Users can lay the mic wire in and snap the top in place with or without connectors attached. This results in wire exposure at each end and at the middle elbow.

The riser incorporates an A3F, female XLR connector in its top, and wire goes into the body of the riser, exiting down through the table or though a slot provided for side exit. The riser is 15 inches tall, so it can be placed adjacent to or just behind most VGAs and nearfield speakers. It is pre-wired with a three-foot extension from the base.

The 61900 series is available in black or beige with gold springs.

For more information, including pricing, contact O.C. White in Massachusetts at (413) 289-1751 or visit www.ocwhite.com.

TECH UPDATES

Sonifex Redbox Line Features Preamps

Sonifex recommends its RB-MA1 low noise mic preamp or RB-MA2 dual low noise mic preamp from the company's Redbox line when amplifying a mic signal to an analog line level output.

They feature balanced mic inputs on XLR-3 and an adjustable output gain range from 36 dB to 75 dB, adjusted by a recessed pre-set potentiometer, which allows for the use of dynamic and powered mics.

The line output is XLR-3 type and is electronically balanced. The output can be wired unbalanced by grounding the non-phase signal, allowing the user to feed balanced and unbalanced equipment. Additionally, there is a switch to control a high-pass filter and to provide phantom power at +48 V to the connected mic.

For converting a mic signal to a digital input level, the company offers the RB-DMA2, which is 24-bit/96 kHz compliant and consists of two independent low noise mic preamps. Individual analog balanced line-level outputs also are produced for use in feeding talkback systems, for example. The unit can either be used as two independent mic amplifiers, or one mic input can be copied to both channels of the digital output.

The RB-DMA2 has AES/EBU, S/PDIF and Word Clock sync inputs. There are four synchronization modes depending on whether internal or external synchronization is used. For the digital output, there is a switch available to define the content of the channel status bits embedded within the digital audio stream. The channel status bits will be forced to Professional mode for sample rates above 48 kHz, as they are not supported by Consumer mode.

"There are a few applications in radio where you might need to use a separate microphone amplifier to magnify a microphone signal up to live level, instead of a studio mixer," said Marcus Brooks, managing director for Sonifex. "Perhaps you don't have space for a mixer, for example in a small talk area. Perhaps you don't have a mic input on the mixer in use, like some larger routing/mixing consoles that have mainly digital line inputs and no mic inputs.

"Perhaps the mixing console is a long way from the mic. An example of this is when using a wired mic on an outside broadcast, which might involve having a cable up to 300 feet long. This has to be a balanced line signal as opposed to a mic signal to retain quality," he said.

For more information, including pricing, contact Independent Audio at (207) 773-2424 or visit www.independentaudio.com.

Mackie HRS150 Suitable for Surround Monitoring

The HRS150 active subwoofer from **Mackie** has a 15-inch downward-firing woofer and two side-firing 12-inch passive radiators. The company says it is powered by 950 watts of low-distortion Mackie Active Amplification and provides a tight response with high output. A power supply tracking peak limiter protects the transducer

The HRS150 is THX PM3-approved and has switches for THX low-cut filter and LFE gain, allowing for THX mixing and monitoring. Additional filter options enable AC-3 and DTS applications.

XLR and RCA input and output connections provide compatibility with professional and consumer systems.

Left and right inputs are provided for a 24 dB per octave variable crossover ranging from 55 to 110 Hz allowing the sub to match crossover points with other monitors on the market. The footswitch option offers monitoring of mains and a sub with crossover, or mains at full range with no sub.

Applications include 5.1 and 7.1 surround monitoring, post-production and mid- to large-sized recording studios.

Mackie also offers the HR624 six-inch monitor and HR626 dual six-inch monitor. The HR 624 is similar to the HR824 but is lightweight and has a compact size. The HR626 touts a D'Appolito woofer-tweeter-woofer design, with one 6.7-inch woofer on each end of the cabinet and the dome tweeter in the center. The monitor can be set up vertically or horizontally.

For more information, including pricing, contact Mackie at (800) 258-6883 or visit www.mackie.com.

USER REPORT

Heil Debuts ProLine Studio Mics

by Kevin McCarthy
Executive Vice President
Sounds of Chez Le Chasseur Inc.

ST. CHARLES, Mo. My first foray into the field of entertainment began 40 years ago while attending a central Illinois high school. Like all 17-year-olds, I thought my rock-and-roll band would be the next Beatles. Our lead guitar player drove us south to Marissa, Ill., to "Ye Old Music Shop," where he had found an outlet for the rolled and pleated Naugahyde Kustom amplifiers.

He had found nirvana, and I found Bob Heil.

Twenty years later, after a stint in the Army and paying my dues throughout the Midwest, my radio career brought me to St. Louis and CBS Radio's KMOX(AM-FM), where an on-air interview with the station's resident Gadget Guru re-introduced me to Bob.

McCarthy with the PR20 Gold Line (top), PR40 (bottom right) and HM Pro Plus (in hand).

Sub hed

I now have my own audio/video production company and make a living by recording and producing quality audio and video. Over the years I have done commercials, station imaging promos and industrial voiceovers, etc. in studios throughout the United States and Europe. Each studio has microphones with names like Neumann, Shure, Sennheiser, AKG and Audio-Technica.

The PR20 series offers sound quality at a reasonable price. I especially like it for those screaming 'Sunday, Sunday ... Be There, Be There'-style voiceovers.

When I built my studio the budget was tight. I decided on the Sennheiser MD 421 dynamic mic and an Audio-Technica AT4033 condenser mic. Field microphones consisted of a bag of Shure, ElectroVoice and AKG mics.

At NAB2004, I once again ran into Bob Heil, who told me about a new microphone he had designed for Joe Walsh and the Eagles. The **Heil Sound** ProLine PR20 is now the group's "front line" mic. I decided to give it a try and found this introduction to the PR line to be a smooth-sounding dynamic microphone.

The first thing I noticed as I opened the box was the attention to quality. The box was polished hardwood with brass fittings, and looked like it should cost more than the mic.

The next thing I noticed was the feel of the microphone. It felt good. This is not part of the criteria for sound quality, darn it, but it just felt good.

Now came the real test — plug it in and listen to how it sounds. The PR20 has little, if any, coloration across the audio spectrum and is difficult to overload. Its cardioid pattern offers good sound rejection and feedback control in live sound environments. Musicians may well find this to be a good instrument mic, as well as a vocal mic. When it came into my studio the Sennheiser MD421 went back in the box.

The PR20 series offers sound quality at a reasonable price. I especially like it for those screaming "Sunday, Sunday...Be There, Be There"-style voiceovers. It retails for $125.

The PR30 and PR40 series of microphones are the company's mics touted for broadcast studio use.

The PR30 has a cardioid pattern and an isolated element that works well in an on-air studio. It fits in an ElectroVoice shock mount, but the Heil Sound shock mount and mic boom are a better combination.

It features a wide frequency response of 40 Hz to 40,000 Hz, and a dual-wound voice coil with a neodymium magnet structure, which creates a strong magnetic field. A second hum-bucking coil reduces extraneous noise from close-by magnet fields. The PR30 retails for $199.

The PR40 is the production studio version in this series, with a large-diameter element, cardioid pattern and a virtually flat frequency response of 20 Hz to 18,000 Hz. Please note this is a dynamic microphone, not a condenser mic. Phantom power *not* needed.

I just used this microphone to do a set of promo IDs for Armed Forces Radio Iraq, and to do a new series of safety announcements for the Staten Island Ferry. It is natural-sounding and smoother than many big-name condenser mics I've used over the years. For a list price of $209, it rocks.

For more information, contact Heil Sound in Illinois at (618) 257-3000 or visit www.heilsound.com.

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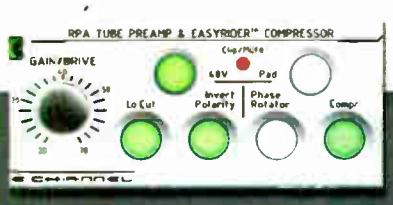
APHEX MODEL 230 MASTER VOICE CHANNEL

Introducing the Aphex Model 230 Master Voice Channel, the most powerful processor ever designed specifically for voice.

Voices will be bigger, more present, more intimate, more intelligible and more consistent. Its comprehensive complement of exclusive proprietary features brings these benefits to any voice – from a thundering bombast to a whispering waif – without changing its essential quality.



Every element of the Model 230 is superior to any other voice processor's similar function...

- The RPA™ tube preamplifier provides warmth, image and detail.
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- The Big Bottom® and Aural Exciter® add resonance, depth, presence and clarity.
- The parametric EQ takes care of any frequency anomalies with surgical precision.
- Post-processing insert point, -10dBV and +4dBu analog outputs, 24/ 96 digital outputs on AES3, S/PDIF and Optical, word clock I/O, and a cough switch with soft mute allow the Model 230 to be easily interfaced into any system.

So if you *are* looking to touch your listeners, you should be looking at the Aphex Model 230.

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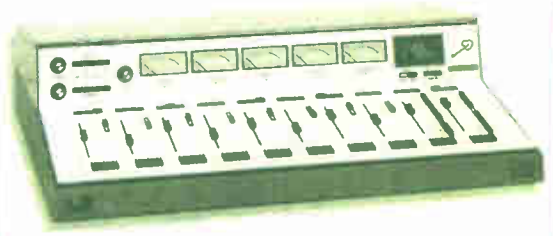

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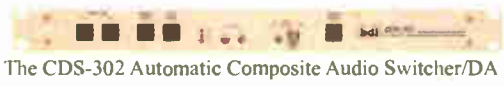

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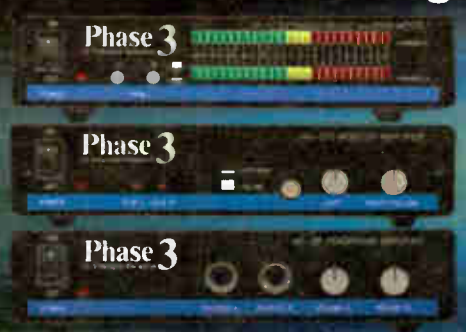

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TECH UPDATES

AKG C 542 BL Mic Uses Boundary Layer Principle

AKG Acoustics offers a small boundary mic, which the company says is suitable for studio and installed sound applications. The C 542 BL replaces the C 562 BL, and has a non-reflective finish. The switchable bass filter reduces rumbling or wind noise. The slop of the filter is 12 dB/octave with a corner frequency of 150 Hz.

The company says the C 542 BL operates on the Boundary Layer principle with the capsule element mounted in the surface area of a boundary (plate) so the front of the mic is facing the sound source and is flush with the acoustically reflective surface of the boundary. This method minimizes comb-filter or interference effects, heard as uneven frequency response with an increasing high-frequency rise that happens when mics are placed near reflecting surfaces.

The polar response of the C 542 BL is omnidirectional in front of the plate, or hemispherical, which means the mic is sensitive from the front of the used boundary area. The omnidirectional transducer used is insensitive to vibrational noise and less susceptible to wind noise. The rubber feet on the mic coupled with the enclosed adhesive material reduce residual noise from the structural vibrations of walls or floors.

The C 542 BL retails for $352.

AKG says its H 85 spider-type shock mount was developed for use with the AKG C 414 B-XL mic. When compared to the H 100 that is included with most of the AKG Studio Line mics, the H 85 has a narrower outer diameter, reduced from 120 mm to 100 mm or 4.7 to 3.9 inches. It can be placed closer to an instrument or other sonic source, and also has an increased clamping range from 19-26 mm or .75 to 1.02 inches.

The H 85 also comes with a brass insert that allows it to be used with European-sized 9.37 mm mic stands, or removed for use with U.S. standard 5.8-inch stands. The H 85 can be used with mic with cylindrical or slightly conical shafts.

For more information, including pricing, contact AKG in Nashville at (615) 620-3800 or visit www.akgusa.com.

Neumann to Debut First Dynamic Mic

Neumann's BCM 705, the second in a new broadcast line and its first dynamic mic offering, uses a redesigned version of the Profipower Sennheiser MD 431 handheld stage mic and capsule. It is housed in the same body as Neumann's BCM 104 but features a green badge.

The company says an overhaul of the MD 431's capsule was required to reduce tolerances in frequency response and sensitivity to meet the application specifications for the BCM 705. The chamber surrounding the capsule is enlarged and acoustically coupled to a rear entrance port, to enhance low frequencies.

The wire mesh pop screen principles used in the KMS 105 and BCM 104 mics are used in the BCM 705, removing the need of foam in front of the capsule as originally used in the MD 431. The integrated pop screen can be removed for cleaning without the use of tools; individual color-coded head grilles are available for each user.

The company says while the BCM 705 is meant for close talking, there is little low-frequency build-up due to the proximity effect. It is suitable for air talent who prefer to work slightly further away from the mic yet maintain a solid bass response.

Additionally, the capsule's mechanical suspension was redesigned to reduce the mic's sensitivity to stand movement or handling shocks. The mic in its mount is elastically suspended and compatible via standard broadcast mic arms.

The BCM 705 retails for $799.

For more information, contact Neumann in Connecticut at (860) 434-5220 or visit www.neumannusa.com.

SPECIAL REPORT

A Primer on Powering Your Mics

The Author Breaks Down Phantom Power, Examines Power Options for Condensers

by Bruce Bartlett

In many radio stations, condenser microphones are prized for their smooth and detailed sound quality. These mics need power to operate their internal circuitry. Each microphone is remote-powered by some sort of power supply — phantom power, a battery or DC bias.

The powering options can be confusing. This article will explain the three ways to power condenser mics and will offer tips on proper use of phantom power.

Mic powering options

First, why do condenser microphones need power? All condenser mics have an impedance-converter circuit (an FET source follower or vacuum tube), which requires power to operate. Also, true-condenser (external bias) mics need a DC voltage applied across the diaphragm and its adjacent backplate to charge them up, creating a variable capacitor. Electret-condenser mics do not need this DC voltage because an electret material on the backplate supplies the charge. But the mic still has an impedance converter, which requires power.

A condenser microphone uses one of these types of powering: phantom power, either from a separate phantom-power supply or from a mixer; DC bias from a stand-alone supply; or DC bias from a battery or sound-card jack.

Different types of microphone run off different types of power. Solid-state condenser microphones with balanced XLR connectors are powered by phantom power, which is on the same cable leads as the audio signal. Tube condenser microphones are powered by a stand-alone power supply. In the multi-conductor mic cable, power is fed to the mic via power leads that are separate from the audio leads.

Mic capsules with pigtail cables, and "computer mics" with mini phone plugs, are powered by DC bias (not phantom power) on a separate cable lead. The mic cable has three conductors: unbalanced audio, power and shield (ground). The DC bias comes either from a battery or from the ring terminal in a sound card mic input.

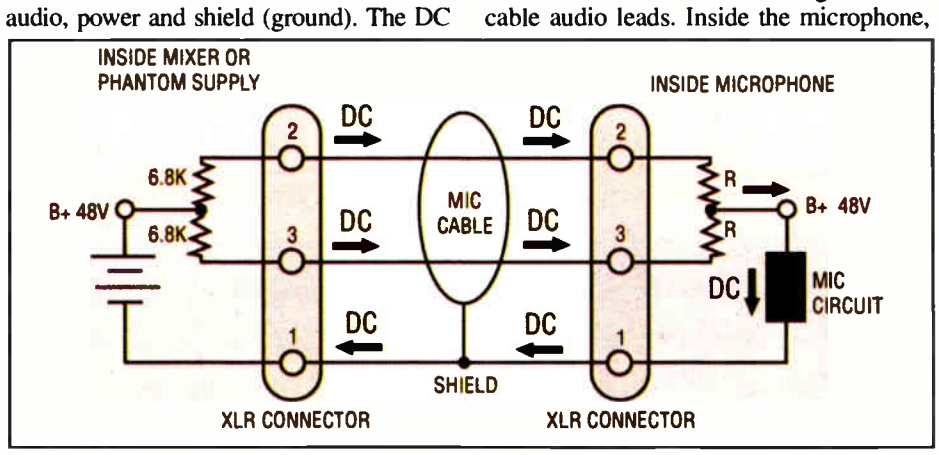
The Royer R-122 and SF-24 ribbon mics include an output circuit that is phantom powered. The Audio-Technica AT3060 and Microtech Gefell UM900 tube mics are phantom powered.

Phantom power is supplied to a mic through its two-conductor shielded mic cable. The power comes from an outboard phantom power supply or from a mixing console with built-in phantom at each mic connector. The microphone receives power from, and sends audio to, the mixer along the same cable conductors.

According to DIN standard 45596, phantom powering is a positive voltage (12 to 48 VDC) on XLR pins 2 and 3 with respect to pin 1. The cable shield is the supply return. There is no voltage between pins 2 and 3. Pin 1 is ground; pin 2 is audio in-phase and pin 3 is audio return.

Some mixers offer switchable phantom on each mic input; others apply phantom to all mic inputs at once when you turn on a single phantom switch. This switch is often labeled "P48."

The diagram below shows a simplified phantom-power circuit. A DC voltage (say, 48 volts) is applied through two equal resistors to pins 2 and 3. The resulting direct current travels to the mic through the mic cable audio leads. Inside the microphone, two equal resistors in series are across XLR pins 2 and 3. DC for the microphone circuitry is taken off the center tap of the two equal resistors. The DC returns to the phantom-supply ground via the cable shield on XLR pin 1.



The power-supply resistors must be high enough in value so they don't load down the microphone, and high enough to isolate several microphones from each other in case one mic cable shorts the supply. The recommended value is 6.8 kilohms for a 48 V supply.

These resistors also must be low enough in value so that when the mic drains current through them, they don't drop the phantom-supply voltage excessively. If the resistors are too high, the phantom voltage will sag when a mic is plugged in. The higher the current drain of the mic, the more the supply will sag. Condenser mics will distort or fail to operate if the phantom voltage is too low due to excessive loading of the phantom supply. If your mixer lacks phantom power, you can buy a phantom supply, such as the Crown PH-1A.

Cautions for phantom use

Can you plug a dynamic microphone into a phantom supply without damaging the mic? Yes. That's because the voice-coil leads are not connected to pin 1, so no current from the phantom supply can flow through them.

The same is true for ribbon mics. However, if the pin-2 or pin-3 wire is accidentally shorted to pin 1 inside the mic, and you apply phantom power, 48 volts will appear across the ribbon and will probably deform it.

Don't plug a mic into an input with phantom already switched on, or you'll hear a loud pop. If you have no choice (as during a live concert), mute the mic's input module before you plug or unplug the microphone. Also, avoid having phantom in a patch bay because someone is likely to patch in and cause a pop. If you must patch into a jack with phantom on it, mute the mic first. Mic-level patches should be avoided anyway.

Some phantom supplies cause a hum when you plug in an XLR connector that ties the shell to ground. Float the shell. This also helps to prevent ground loops.

Because the cable shield carries the DC return, be sure the shield and its solder connections are secure. Otherwise you can expect crackling noises, especially when the cable is moved.

Phantom is a consideration when you split a condenser mic's signal to two or more mixers. A mic splitter usually contains two XLR mic connectors in parallel (mic in and mic out), and one or two transformer-isolated XLRs (mic out). The mic-out connector that is in parallel with the mic-in connector is called the direct feed. The mixer connected to the direct feed must supply the phantom power for the mic. If you apply phantom to an isolated feed, that phantom power will not reach the microphone.

If you split a condenser mic signal with a Y cable, power the mic from only one mixer. Turn off phantom in the other mixer(s); otherwise hum can result.

Power supplies are rated in the total number of milliamps they can supply. Make sure the total current drain of all the mics plugged into the supply doesn't exceed the supply's current rating. The current drain spec of a microphone is in its data sheet.

Some microphones work on an internal battery or phantom power. In most designs, connecting the mic to phantom automatically removes the battery from the circuit. Otherwise, the battery would severely load down the phantom supply. If this appears to be happening, remove the battery.

If a condenser microphone doesn't work because the phantom voltage drops too low when the mic is plugged in, try these suggestions: supply phantom from a better-regulated console; use a mic with less current drain; or use fewer condenser mics.

Bruce Bartlett is a microphone engineer and technical writer for Crown International.

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In return, you'll be paid a great salary, outstanding benefits, and a 401(K) program the company will pay into.

I'll be at the NAB show in Las Vegas. Give me a call on my cell phone. Jay White, Corporate Director of Engineering, 760-219-9200 or e-mail me your resume, jay.white@morris.com. Morris is an Equal Opportunity Employer.

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Bob Murphy

Just got done reading your great piece about Bob Murphy ("Bob Murphy, the Voice of Family Ties," Dec. 15). Thanks for taking the time to write and bring back some memories for myself, as well.

I was just nine years old and attended my first pro game at Shea during the 1969 pennant stretch. A no-hitter by Bob Moose of Pittsburgh.

Photo courtesy NY Mets

Nelson, Murphy and Kiner

I later met Bob during one of the strikes in the early '80s when I was covering the Rochester Red Wings and the major league baseball broadcast teams were carrying minor league affiliates. He was just as cordial and professional in person as he was on the air. I later worked with his last partner, Gary Cohen, when he was broadcasting Pawtucket games and I was doing the Rochester ones in the late 1980s.

Thanks again.

Warren Kozireski
Instructor-Broadcasting
SUNY Brockport
Brockport, N.Y.

I enjoyed your story on Bob Murphy. It helped me, a Met fan from 1973, recall some great stories.

I was not at Shea for his tribute but I admired the television coverage, complete with retro-styled camera angles. Besides the Mets loss that night, it was equally sad that TV only simulcast Murph's call of the last batter of the game. Why could they not have put on the *whole* last inning? As things turned out, it was a quick last at bat and the audience was left feeling pretty empty. Life is like that sometimes. Lives, in casting or otherwise, can pass by so quickly.

I have had a meager broadcasting career, but I was blessed to meet Murph on a few occasions. I best remember seeing him in Pittsburgh before a Pirate game in 1988. He could not have been friendlier to me, a kid barely out of college.

Murph was the voice of the Mets. True Met fans knew this and it did not matter to us that he no longer was on television. History has shown that many who appeared after Murph on the boob tube were appropriate for the connotation.

Lindsey Nelson is remembered for his drawl and flamboyant jackets. Ralph Kiner is remembered for his Hall of Fame slugging and (sadly) an inept post-game show. Bob Murphy, in my own humble opinion, was the faithful servant — never too high or low on the air. Even the photos that accompany the article show a man who blends in and does not stand out. But it was that 42-year faithful service that is his testament.

Joe Quattrocchi
Announcer, "Sound of Life"
WFGB(FM)
Lake Katrine, N.Y.

Read the article on Bob Murphy, and had to write and say thanks for the stories. Although I'm a bit younger than the author, I still remember my younger days staying up late and listening while falling asleep.

He'll be missed, and the author is lucky enough to have worked with him.

Gregory Ahlfeld
Engineer, "Sean Hannity Show"
ABC Radio Networks
New York

Vintage Music Beds

While my talents in broadcasting lie mostly in engineering, I'm often called upon to help develop computer-based applications because my "9 to 5" has me working as a computer support technologist.

I thought RW readers in my situation would be interested in knowing about a source of vintage-sounding production music.

An oldies station approached me, as they wanted to create a presentation for their potential advertisers. They wanted a digital movie that could be distributed on a CD-ROM or downloaded from the Internet, to show how advertising on the station would benefit the potential client.

Station staff would provide the voice talent from scripted text to augment video footage from a variety of sources. While the station wanted music that sounded like their programming, they expressed a desire to have vintage-sounding music beds over which the narration could be delivered without getting in the way of the overall presentation.

After some research I found Thomas Filip, owner of Filigrafix Media Design. Having been in business almost two years he launched the Filigrooves music division in the first quarter of 2004. Filigrooves specializes in 1950s, '60s and '70s vintage-sounding music utilized in multimedia and Internet applications.

While available separately, I opted to purchase the entire production suite. Offerings include three distinct styles: Ballads and Soft Grooves, Easy Listening and Funk.

The main difference between this library and many others is the sound. The music is created using instruments such as Hammond organs and the Fender Rhodes e-piano, while other libraries rely on synthesizers. The sound is rich and full and the arrangements bring the audience back in time.

The library consists of music loops, which can be edited to desired length as well as tracks ranging from one to two minutes. The files are presented in AIFF, MP3 and WAV formats so the music is easily accessed regardless of what computing platform you're using.

Filip also is able to custom produce vintage music for specific applications.

The library can be used in multimedia and Internet applications royalty free. Broadcast licensing is available for those who wish to use this music on-air. Licensing is negotiated directly with Filigrooves.

You can contact Thomas Filip directly via the Filigrooves Web site, *www.filigrooves.com*.

Bill DeFelice
Webmaster
History of Westport Connecticut Radio
Westport, Conn.

GUEST COMMENTARY

Distorting Group Delay Distortion

A Commentary About Group Delay Left A Ringing in Orban's Ears

by Bob Orban

Dana Puopolo's Guest Commentary, "Let's Keep AM Sounding Good" (Jan. 19) contains a number of technical errors.

Mr. Puopolo's thesis hinges on the ideas that the thing which causes 5 kHz low-pass filters to sound less pleasing than 10 kHz NRSC filters is group delay distortion, and that the 5 kHz filter moves into the frequency range to which the ear is most sensitive. However, when he starts to make technical claims about the nature of group delay and group delay distortion, things go awry.

Break it down

The statement "group delay is exactly what it says: delay" is simplistic. In fact, it is only true when the group delay of a filter is constant at all frequencies; otherwise, the truth is subtler.

Group delay at a given frequency is defined as the negative of the slope of the filter's phase response at that frequency. This definition can lead to frequency ranges where group delay is negative, something common with high-pass filters. Nevertheless, a negative group delay does not imply the output of the filter arrives before the input, which is a physical impossibility.

What is group delay distortion? It is the variation in group delay as a function of frequency after we have subtracted as much of a constant delay as possible. For low-pass filters, the filters under discussion here, this constant is usually the group delay of the filter at zero frequency. (A filter has a well-defined group delay at 0 Hz, as unintuitive as this might seem. It takes some calculus to justify this.)

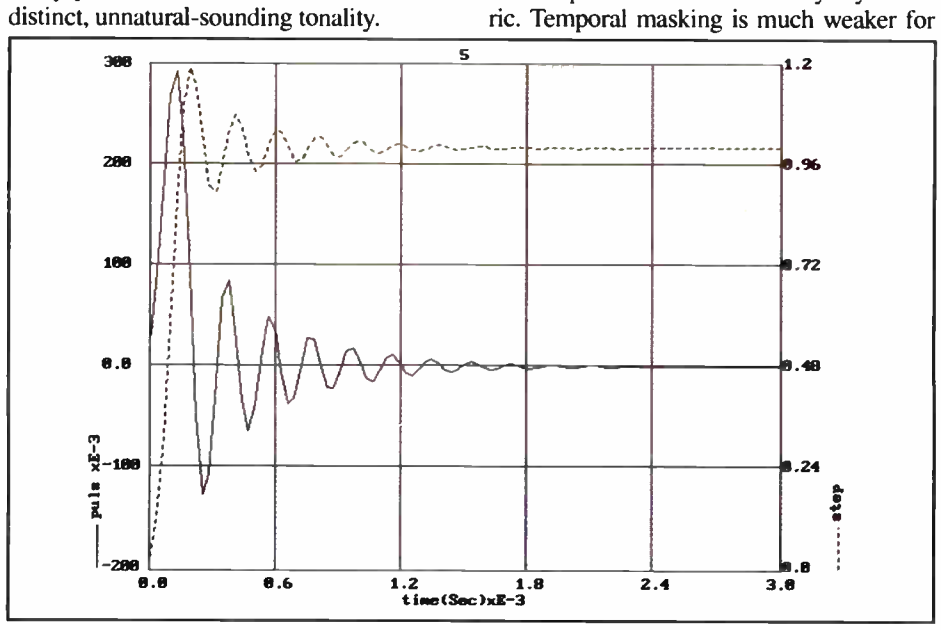
Contrary to Mr. Puopolo's assertion that "humans can hear time delay distortions and filter group delay (distortion) quite easily," the technical literature indicates that humans are, in fact, about two orders of magnitude more sensitive to magnitude distortion (what is often informally termed "frequency response") than they are to phase distortion.

Mr. Puopolo goes on to argue that although some "engineers with good intentions" pointed out to him that "modern computer filter design can produce audio filters that have low group delay (distortion) right up to their cutoff frequencies ... the group delay in the (radio's) IF filter can multiply with the delay in the audio filter, causing severe audio artifacts." There are several problems with these statements.

First, it is easy to produce filters in DSP that have no group delay distortion at any frequency. These types of filters are used frequently. Because the group delays of cascaded filters add — they do not multiply, contrary to Mr. Puopolo's assertion — cascading such a filter with the IF filter in a radio will not have the slightest effect on the group delay distortion of the cascade. The group delay distortion of the combined filters will be the same as the group delay distortion of the radio's IF filter.

In short, Mr. Puopolo's explanation for the unpleasant things we can hear with sharp-cutoff filters in the audio midband does not hold up to technical scrutiny. However, there are certainly problems we can hear, and there must be an explanation.

I believe these filters ring when hit with transient material and this ringing is what we hear as unpleasant. The filter stretches out audio events that the ear expects to be sharply defined and imbues them with a distinct, unnatural-sounding tonality.



An impulse response graph from a minimum-phase 5 kHz filter with considerable group delay distortion.

What does this ringing have to do with group delay distortion? It turns out that for a given amount of selectivity in the magnitude domain, filters with no group delay distortion have impulse responses that are substantially more spread out in time than filters with the minimum possible phase shift, the so-called "minimum-phase" filters.

In other words, filters with no group delay distortion smear impulses more severely than filters with lots of group delay distortion. What's even worse is the filters with no GDD introduce pre-ringing before the energy peak of their impulse response, while the ringing in minimum-phase filters occurs only after the energy peak.

Case compromise

We know from psychoacoustics that the ear has a property called "temporal masking," which means a strong sound (the "masker") is able to prevent the ear from detecting weaker sounds that occur before or after the masker.

This phenomenon is markedly asymmetric. Temporal masking is much weaker for sounds occurring before the masker than after the masker. This means it is a bad idea to introduce pre-ringing in a filter, which is exactly what a filter with no GDD does. So it is reasonable to argue on psychoacoustic grounds that a minimum-phase filter is likely to have less audibly objectionable ringing than a filter with no GDD, which is exactly the opposite of Mr. Puopolo's conclusion.

What, if anything, is the optimum design? Making filter slopes gentler will reduce ringing but also will markedly impact the ability of a filter to prevent first-adjacent interference. If we assume the system specification imposes a minimum selectivity requirement on the filter, how does one shape the group delay?

In Orban's current AM processors, we correct the low-pass filter for group delay distortion up to about 80 percent of its cutoff frequency. This compromises between the pure minimum-phase case and the constant group delay case. A filter designed in this manner has pre-ringing of much shorter duration than a filter with no group delay distortion, yet the amplitude of the highest overshoot is substantially less — by almost 50 percent — than the amplitude of the overshoot in a minimum-phase filter.

We consider this to be the best compromise when system specifications require a filter with a cutoff frequency in the range of 5 kHz.

For a 10 kHz cutoff frequency or above, one can make more of a case for a filter without group delay distortion because these filters have the lowest overshoot amplitude, while the higher cutoff frequency is accompanied by proportionally shorter-duration impulse response.

Orban has long suggested that stations use an NRSC cutoff during the day because studies done at the time of the creation of the NRSC1 standard indicated there were few geographical areas where first-adjacent interference is a problem during daylight hours. At night, we proposed using 5 kHz, which prevents any first-adjacent skywave interference.

We still think this combination makes the most sense if the goal is to maximize real-world audio quality. The NRSC bandwidth provides marginally higher audio quality than 5 kHz through typical radios during the day, but at night the benefits of reduced first-adjacent interference far outweigh the subtle improvement the NRSC bandwidth would make in basic audio quality.

Simultaneously, we recognize that Jeff Littlejohn has made some valid points regarding improved modulation efficiency when modulation energy is not wasted by transmitting frequencies the average radio cannot reproduce. The NRSC currently has a working group studying the various trade-offs involved in lowering the transmitted bandwidth, and we hope to have some more definitive answers as this work progresses.

Bob Orban is founder of Orban and president of Orban/CRL.

Hate the Harmony

I read Charles Fitch's article, "Me and My Trusty Amprobe" (Dec. 1), and found it to be useful.

My question to Buc: Do you have any ideas on getting PCs to run from power lines that might be full of harmonics? I am interested in ideas that do not require running larger lines. This has been my solution, too, but I would love to throw some kind of filter (active or passive) in there instead.

Gary Brefini
Dedham, Mass.

Fitch replies:

In your case there really is no cost-effective, easy, reliable fix to smooth out harmonics to reduce neutral currents etc. caused by switching power supplies in computers.

The best solution in my meager experience is to cluster all harmonic loads on a subpanel in the space and supply this via a "harmonic transformer," a product where Sola dominates the marketplace.

Look at www.sola-hevi-duty.com/products/transformers/KFactor/ *for its line of "K" transformers.*

These are main supply transformers. I do not know if anyone makes a small line-level version of this concept; other readers may. K transformers only address the harmonic (waveform) issue. If PQ is a problem as well, then you have to move up one more step to a Harmonic Mitigation Transformer.

Power Factor Correction Networks

I read with great interest Buc Fitch's feature on clamp-on ammeters. These are indeed handy devices that belong in every engineer's toolbox.

One item not mentioned, however, was the effect of power factor correction networks on the operation of the clamp-on ammeter. Many transmitter manufacturers employ reactive networks on the incoming power connection of their transmitters for the purpose of restoring the proper phase relationship of the incoming AC voltage and current at that point.

Because these networks alternately store and release energy, they "confuse" the indication of a clamp-on AC ammeter used on the circuit, almost always causing the ammeter to read higher than the actual current and giving the impression that the AC to RF (overall) efficiency of the transmitter is much lower than it should be.

To get a correct AC current indication on any device employing a power factor correction network, temporarily disconnect the network, with power removed, of course. Reconnect the network after the measurement. The manufacturer should be able to provide the power factor of the transmitter with the network out of the circuit so you can calculate actual power consumption.

Cris Alexander
Crawford Broadcasting Company
Denver

◆READER'S FORUM◆

Small-Market Voice

I was prompted to write after recent letters to the Reader's Forum spoke out for many of us in the smaller markets.

I left the radio business in 1984 and never thought I would return. Eighteen years later I rejoined it, but only on the engineering side. I expected changes galore, but not the type we are seeing.

One of the first changes I noticed is many of the people I see working as broadcast "engineers" today are not qualified or trained to take on the tasks they are asked to do. Typically the station will not pay for a qualified engineer and instead take their chances that "Chip the PC repair technician" can go out and get that Harris FM20K started again.

This is due, in part, to the competitive marketplace, as well as pressure to "run cheap" at all times. Sometimes it is because there is a shortage of qualified technicians. The pressure to run cheap is also due to the fact that the large group-owned station up the block has no staff, but only a satellite receiver, automation system, transmitter and sales staff.

Another change that has baffled me is this rush toward AM and FM digital (IBOC) radio with no explanation of how it will benefit the listener, if it will at all benefit the station and how it will be paid for. I see article after article in RW and other publications focused on the new technology, but nothing about the paybacks.

I do hear a lot from the engineering community about the challenges of FM HD Radio. I also hear of many nasty technical problems coming out of AM IBOC and how it may well destroy nighttime listening for the many of us still enjoying AM for this.

I do not hear how a group or station was able to significantly up its revenue, increase rates or increase its spot load because it now has a digital signal only a few radios can hear. My hope is that HD/IBOC radio is something that stays in the major markets where they can afford to play "keep up with the Joneses."

Talk radio has brought back many listeners of the AM band, and there are even a few new music stations on the band. It sounds like AM IBOC is going to kill that recovery, not help it.

One other change that baffles me is why my stations' staff and I recently spent several hours changing traffic and programming logs for two popular satellite-fed programs we carry because Clear Channel says so. That's either proof that "big" equates to clout, or that Clear Channel owns too much.

I guess we will see just how powerful "big" is when we all reduce our AM bandwidth as Jeff Littlejohn says we should. When I saw the recent RW article "NRSC Seeks Input on RBDS" (Jan. 19) and the quotes from Chairman Littlejohn, my first thought was not about the merit of standardization but rather, "Okay, so what is Clear Channel going to get out of this?"

The "Less is More" program I advocate for U.S. radio markets is "less" conglomerate-owned stations with little local presence and "more" locally operated and community-focused stations. As the FCC no longer seems to care about community focus and instead pursues policies that are cost-prohibitive to the small broadcaster, I doubt this course will change.

Allan A. Augustyn
Network Engineering
Radio Results Network
Escanaba, Mich.

Good Neighbor Radio

Radio World is enjoyable reading for me because I'm an old-time radio favorite. I fell in love with radio when I was a teenager in Roanoke, Va., and practiced saying "WDBJ in Roanoke, Virginia" as I carried the morning newspaper. I could see the red tower lights blinking about five miles from home.

Later I hung around WROV(FM), a 250-watt peanut whistle that let me hang around — trying unsuccessfully to get hired — and produce a weekly series of Boy Scout scripts I got from BSA headquarters. The PD, Mr. Gordon Phillips, let a skinny red-headed kid who didn't know up from down about radio production have a go, and bailed him out when the going got sticky on Saturday morning.

The Quonset-hut-housed transmitter building also was a place where I made friends with Frank, an engineer, and watched the recording lathes pick up stuff from the Mutual Network, which then had to be transported downtown to the top floor of the Mountain Trust Bank building, where 16-inch turntables played those delayed broadcasts.

I listened with fascination to "The Johnson Family," with voices done by Jimmy Scribner. Many years later when I worked for WMUU(AM) in Greenville, S.C., an O&O of Bob Jones University, where I graduated with a degree in Radio Speech in 1953. Jimmy was still supplying children's stories in the character of "Uncle Remus," and using the same voices I remembered.

RW gives me a shot of nostalgia as well as updates on technical stuff I hardly understand any more. I work just two hours a day for WCAB(AM) in Rutherfordton, N.C., which still puts out "good neighbor" radio, and I produce one-minute "Just a Minute" commentary of current events from a Biblical perspective that airs on WCAB and WMUU several times each weekday. I'm still trying to figure how to distribute what I write. Promotion is not my strong suit.

I taught a semester course in programming at the local community college, and learned a lot more than the students did. I found RW a good information source for those kids who knew virtually nothing about the reality of what's on the air today.

Radio World carries me into all those worlds. My First Class Radiotelephone Operator license has morphed into a permanent "General" one now, and hangs here in our log home in Rutherfordton alongside an "Extra" Amateur license. But I know more about tubes than transistors, and had to study the recent issues of RW to figure out what a codec is.

Lots of the abbreviations used in industry today are a mystery to me. But at almost 73, the world of IBOC, surround sound, encoders, decoders and processors is a mystery I have yet to unravel. At least I don't edit sound anymore with Scotch tape and scissors.

Jack Buttram, N4ZHK
Rutherfordton, N.C.

Directional Certification Is a Welcome Development

Radio is a high-tech business. Its continued survival depends to a large degree on a supply of highly-trained engineers and technical staff — people who not only are trained in electronics, computer science and management but also possess the specialized skills and knowledge unique to our business. These basic facts seem to be lost on many in the industry, as we've lamented before.

While other high-tech businesses such as semiconductor manufacture, automotive electronics and biotechnology invest heavily in training, continuing education and credentialing for its members, there are few such programs for broadcast engineers. Hands-on experience, while valuable, is no substitute for a more rigorous study of specialized technical skills, and having a way to demonstrate mastery of those skills.

That's why a recent announcement by the Society of Broadcast Engineers is so welcome.

In February the SBE announced an AM Directional Specialist Certification. The SBE Certification Committee has developed an exam that will help to evaluate an individual's ability to keep AM directional facilities operating properly. Applicants must currently hold SBE certification at the Certified Broadcast Engineer, Certified Senior Broadcast Engineer or Certified Professional Broadcast Engineer level.

Topics on the exam include the operation, maintenance and repair of a directional antenna system; principles of AM radiators, phase addition and cancellation, components of a directional antenna system; FCC rules related to directional antenna operation; test equipment; and safety procedures. The exam will have 50 multiple-choice questions.

While basic antenna theory, including non-directional AM antennas, is taught in most electronics programs, the fundamentals of directional antennas are not. Mastery of directional fundamentals requires a high degree of skill and understanding of RF theory.

SBE Vice President and Certification Committee Chairman Chriss Scherer, CSRE, CBNT noted, "The Specialist Certifications are being established to provide a benchmark of knowledge in specific specialized areas and to recognize those who have attained that knowledge."

The SBE plans to announce additional Specialist Certifications later this year and into 2006. Future certifications topics under consideration include DVT and IBOC, although Scherer adds the membership committee welcomes suggestions from the industry.

It has been said that the SBE is at its best when it steps in to fill a vacuum left by others. This is one such instance, and Radio World applauds the Society of Broadcast Engineers for taking the initiative.

— RW

Radio World
Vol. 29, No. 10 April 13, 2005
Telephone: (703) 998-7600 • Business Fax: (703) 998-2966 • Editorial Fax: (703) 820-3245
E-mail: radioworld@imaspub.com • Web site: www.rwonline.com

NEXT ISSUE OF RADIO WORLD APRIL 27, 2005

For address changes, send current and new address to RW a month in advance at P.O. Box 1214, Falls Church, VA 22041. Unsolicited manuscripts are welcomed for review: send to the attention of the appropriate editor.

Radio World (ISSN: 0274-8541) is published bi-weekly with additional issues in February, April, June, August, October and December by IMAS Publishing (USA), Inc., P.O. Box 1214, Falls Church, VA 22041. Phone: (703) 998-7600, Fax: (703) 998-2966. Periodicals postage rates are paid at Falls Church, VA 22046 and additional mailing offices. POSTMASTER: Send address changes to Radio World, P.O. Box 1214, Falls Church, VA 22041. REPRINTS: Reprints of all articles in this issue are available. Call or write Emmily Wilson, P.O. Box 1214, Falls Church, VA 22041; (703) 998-7600; Fax: (703) 998-2966,

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