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**Who's Multicasting In Chicago?**

Find out on RW's HD Radio Scoreboard.

Page 23

**'We Need to Get Busy'**

David Rehr's remarks about radio at his first spring show.

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# Radio World

\$2.50

The Newspaper for Radio Managers and Engineers

June 7, 2006

**INSIDE**

**STUDIO SESSIONS**

▼ A Lufthansa jet becomes a mile-high studio; and Greg Savoldi tries out the Arrakis X-Mixer Digital Console.



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**BUYER'S GUIDE**

▼ What's new in radio broadcast audio processing?

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## Rehr Wants Broadcasters To Go on the Offensive

*Spotlight Also Falls on DRM, Translators vs. LPFMs*

by Leslie Stimson

**LAS VEGAS** It was a show for newbies. David Rehr, the new president/CEO of NAB, and Kevin Martin, the new chairman of the FCC, met attendees at the annual NAB convention for the first time in those roles.

Both expressed excitement about technology changes in broadcasting and the plethora of platforms through which broadcasters can transmit their content.

Here's an overview of news of interest coming out of this spring's NAB2006. For more on multicasting, IBOC and the NPR Public Radio Engineering Conference, see the HD Radio News section of this issue.

See NAB2006, page 5 ▶

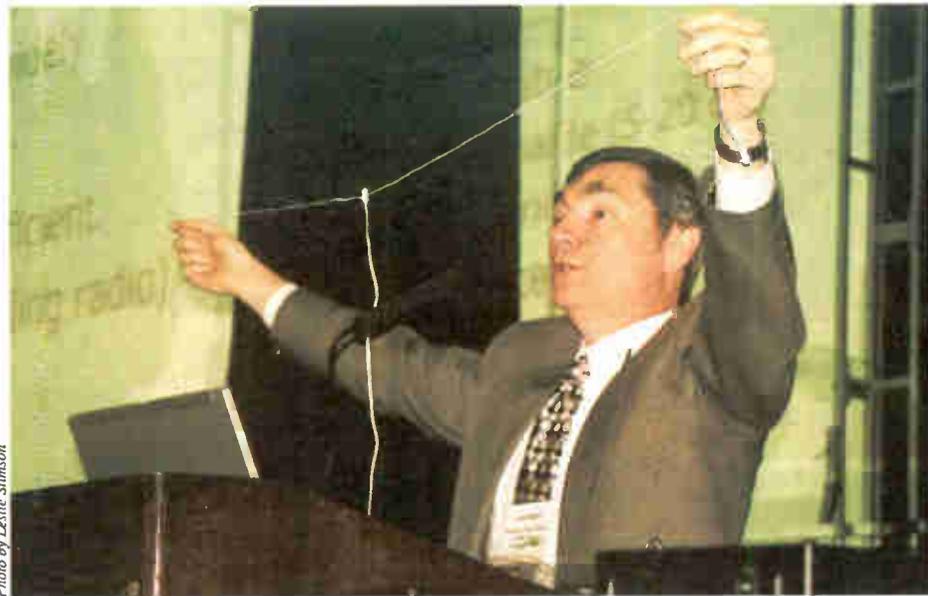


Photo by Leslie Stimson

John Kean of NPR Labs holds up an FM dipole antenna. Further NAB and PREC coverage including HD Radio-related news is found inside.

## Public Engineers Consider Associating

by Leslie Stimson

Public radio engineers are close to deciding whether to form a Public Radio Engineering Association. In May, several sources told Radio World the engineers were leaning towards doing so.

Organizations exist to represent the interests of other public radio professionals, including those in development, management, programming and news. It's time, backers say, for engineers to be represented by an entity concerned about their unique needs.

Mike Starling, vice president and chief technical officer for NPR and executive director of NPR Labs, broached the idea with two others: Ralph Hogan, assistant general manager of engineering services at Washington State University, licensee of Northwest Public Radio; and Dan Mansergh, director of engineering at KQED(FM) in San Francisco.

Hogan and Mansergh, who is also a Radio World contributor, have agreed to

See PREA, page 10 ▶

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# ◆ NEWSWATCH ◆

## Retailers Expand HD-R Campaigns

**ORLANDO, Fla.** In May the HD Digital Radio Alliance announced a second wave of retailers supporting the IBOC rollout.

These are regional campaigns, similar to the nationwide efforts of those launched earlier by Tweeter, ABC Warehouse and Crutchfield.com, according to the alliance.

The new efforts in three markets — Los Angeles, New York and Detroit — include Spanish-language marketing ini-

tiatives: Spanish versions of the spots, in-store and online instruction, staff training and point-of-purchase marketing.

Electronics retailer Ken Crane will carry HD Radios in its stores and launch online and print advertising and marketing campaigns in Los Angeles. Custom spots for Crane highlighting the availability of the Boston Acoustics Receptor HD will air on 13 alliance member stations.

Ads promoting Receptors at Cranes are appearing in the Los Angeles Times.

In New York, tri-state retailers Harvey and Electronics expo are carrying HD Radio products and running similar advertising and marketing campaigns, including spots on 11 stations.

Harvey's campaign includes local ads in consumer publications, including the New York Times Magazine and local AM radio.

In Detroit, regional retailer Mickey Schorr has begun an HD Radio marketing and ad campaign and spots are airing on 12 alliance stations. The retailer is devoting a large part of its campaign to newspaper advertising.

Also in Detroit, ABC Warehouse is expanding its efforts by offering customers discounts on the JVC HD Radios through coupon offers and on special promotions on Kenwood HD Radio tuners. The retailer is also creating promotional sports packages with the Detroit

Tigers baseball team and using direct mail to promote HD Radio.

The campaigns in the three markets are part of the HD Digital Radio Alliance's on-air advertising campaign. The alliance has put the value of on-air promotion this year at \$200 million.

## RadioShack Launches Pilot HD-R Program

RadioShack began stocking HD Radios in some retail locations in May. The firm is the first national "bricks and mortar" retailer to carry HD Radios, as we've reported. In a pilot program, more than 100 RadioShacks in Dallas/Fort Worth began stocking the Boston Acoustics Receptor HD in May for \$299.

Several dozen stores in New York, Los Angeles, Chicago, Philadelphia, Houston and the District of Columbia are stocking the unit as well. Stores in the pilot program planned in-store demos. RadioShack plans to carry its own HD Radios and expand the pilot program in September.

## Cumulus-Suquehanna Deal Closes

Cumulus and Susquehanna are merging stations and personnel now that the acquisition is final. Cumulus Media and investors formed a partnership to acquire

See NEWSWATCH, page 6 ►

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# HD Radio: 'Talk It Up!'

## Managers and Programmers Begin to Feel Their Ways Around a New Digital Landscape

by Leslie Stimson

Why does the industry need an HD Digital Radio Alliance? Because consumers are uninformed about HD Radio.

So said Peter Ferrara, president and CEO of the group, during an NAB2006 session titled "HD Radio Seminar: If You Build It, They Will Come."

About the time the alliance was introduced in January, representatives asked passers-by in New York City if they had heard of HD Radio, according to Ferrara. Most had not. Asked what HD means, they answered with a variety of guesses including "Home Depot," "High Definition" and "High Def."

Stations can take various steps to support the HD Radio rollout, he said, including on-air promotion — mentioning HD Radio in liners and IDs, events and contest giveaways. They could set up listening booths at local events such as bridal or boat shows.

Promotion of HD Radio "will require an industry-wide effort at all levels," Ferrara said.

### Industry effort

Panelists updated attendees on industry efforts to get more HD Radios into stores and increase the number of stations programming HD2 channels. Ferrara urged stations to help.

Talking about manufacturers' products on the air will encourage more receiver companies to make HD Radios. Prices will come down and stations will profit, panelists said.

The HD Radio logo should appear on all sales material and station collateral such as billboards, print and TV ads, Ferrara said.

He suggested that managers encourage employees to visit car dealerships and talk up the technology, or go to stereo stores and ask to see HD Radios. "And when they show them satellite radios (instead) tell them that's yesterday's technology," he advised.

Programmers are having fun with HD2 formats, said panelist Jimmy Steal, program director for Los Angeles' KPWR(FM) and national vice president of programming for Emmis Communications. He said HD Radio is a great opportunity for program directors to invent or freshen formats, customized for each market, filling voids that went unfilled due to cost constraints.

"We have been given a gift here. We're only limited by our creativity," said Steal. "I'm so sick of hearing about satellite radio's marketing campaign."

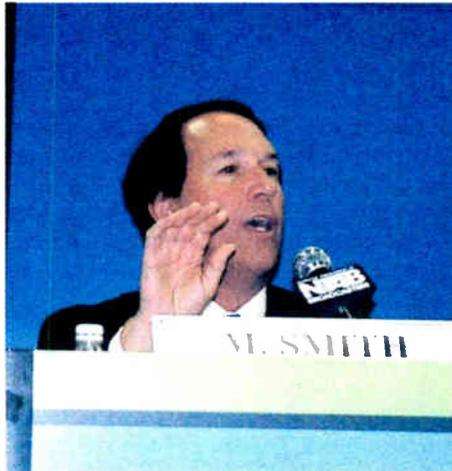
### Same or different?

Supplemental digital channels provide new outlets for talent and formats, he said.

Stations, Steal said, generally are pursuing one of three strategies with multicast channels: brand extensions, demographic extensions and so-called "wildcards," for-

formats that clearly depart from the main digital channel.

Arbitron, he said, is cutting stations some slack while HD2 formats are in their infancy. If the new formats are mentioned in a diary or call-outs, the audience research firm will include that



Greater Media VP Engineering Milford Smith makes a point.

listening in its Persons Using Radio estimates for the Spring 2006 survey, but not credit it to any specific station, said Steal. Arbitron's long-term goal would be to credit that listening to individual stations.

Pat Walsh, chief financial officer of Ibiquity Digital, said 766 stations were on the air with digital signals as of late April, and 214 stations were multicasting. Those numbers increased by early May to 777 and 227 (see page 23). Several also are adding HD3 channels.

Toward the end of this year, Walsh said, the industry could see the first "on-demand" HD Radio, one with the ability to store and automatically update audio services such as traffic and weather.

Prices of HD Radios in general are dropping, he also said, pointing to the Boston Acoustics Receptor HD, which dropped from an original of \$499 to \$299, a change he said was due primarily to the influence of the alliance formed by the major broadcast groups.

Some HD Radios could debut at \$199 by the fourth-quarter selling season, Walsh said.

At NAB, the alliance announced HD2 formats in an additional 22 markets, bringing the number of markets where alliance members are airing agreed-on formats to 50.

The alliance faces challenges, among them the placement of HD Radios in domestic car models. Ferrara said he found it difficult — coming as he does from radio, where a format change can happen overnight — to learn how slowly things move in the consumer electronics world. He said he was told that if U.S. automakers "fast-tracked" HD Radio, it would take 18 months until consumers would be able to choose HD-R as an option or see it offered as standard equipment in new cars.

Milford Smith, vice president of engineering for Greater Media, cautioned stations "to look carefully at your costs over the long term" when pondering HD Radio. "A cheaper installation may not serve you well over the long term, and

this is over the long term."

Smith said the average additional cost for a station to multicast could be roughly \$47,000 to \$77,000 depending on the equipment and complexity of the system. He also encouraged stations to

keep in mind that an IBOC installation "requires more thought and more skills to maintain than analog plants."

Most consumers, Smith added, can't tell you what digital is, but they know they want it.

## Tips for Stations

The following HD Radio promotional ideas to generate awareness at the retail level were offered to stations by officials of the HD Digital Radio Alliance:

**Liners** — On-air. Include HD-R in liners, top-of-the-hour IDs. The more often on-air personalities use HD-R terms, the more people will get one.

**Give-aways** — Events and contesting. Have listening booths at a boat show or bridal event.

**Web site support** — Develop a printable HD-R market listening guide and send listeners to the national site ([www.hdradioalliance.com](http://www.hdradioalliance.com))

**News stories** — The alliance encourages stations to develop local feature stories for Web sites to feature the HD2 channels.

**Station collateral** — Put the HD-R logo on TV spots, print ads and billboards. It should be on all sales material, Ferrara said. Discuss HD-R with every client at every opportunity.

**Talk it up** — The alliance encourages market managers to tell the HD-R story to car dealers and car association meetings. The market manager, GSM and PD should personally visit every HD-R retail location and talk to the manager.

**Employees** — Give station employees HD-R shirts, the alliance says. Get your employees to walk into stereo stores and ask to see HD Radios; and if they show them a satellite radio, "tell them that's yesterday's technology."

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# A Cool Stuff Judge Talks

Next issue we'll tell you all about products that won the 2006 Radio World "Cool Stuff" Awards at NAB this spring. Early birds already know the winners; you can see the list for yourself on our Web site.

The award means a product was selected by a panel of anonymous radio engineers and experts as notable for its design, features, cost efficiency and performance in serving radio users.

The selection of winners raises questions each year, usually from companies that didn't win. This time around I thought I'd let one of this year's anonymous judges address the most common questions I hear.

What should readers know about how the awards are chosen?

"The key word describing the Cool Stuff judges is experience — deep experience. But just as the range encompassed by radio technology is continually expanding, so too are the CS judges and their respective backgrounds. This year's judges included one with serious production chops, one with an IT bent, one from the network engineering management sphere, and, of course, a number of highly experienced station chiefs from both commercial and public radio.

"As you might expect, they each nominate different products from the show floor and lobby the others for their votes, which are hard-won. Some judges bring only a handful of products, while others present a long list. But surprisingly, from such a diverse group, there are typically a few products that all — or nearly all — of the judges commonly nominate. These are the easy, quick awardees. Then the wrangling begins on the other items. During that process, it's interesting to watch how the mutual respect for one other's field of expertise kicks in.

"For example, if a production guy was trying to pitch the RF crew on some new

transmitter, it probably wouldn't pass. But if he were to get all gushy over some new microphone or effects unit, the RF contingent would generally support him, or at least not oppose. Generally, the other judges are all satisfied by the question to the supporters of 'Would you buy this for your own facility's use?'

"What I find appealing about the Cool Stuff process is that there are no categories like 'Best New Audio Processor,' or any limit to the number of awards given each year. The winners are simply the new products that strike the judges as being 'cool.' To these judges, cool means innovative and/or more cost-effective, more useful or somehow otherwise breaking new ground over previous practice.

"It's pretty likely that RW readers will agree on the coolness, and everyone will probably find at least one of each year's winning products applicable and desirable to his or her work in the industry.

"There are some strict guidelines, though, and the judges all take these very seriously — sometimes to the point of argument. They include the requirement that these products are real, appropriately priced and either available or will be so within the next several months.

"Occasionally a product that seemed ready and award-worthy at a given NAB will not have shipped by the next year's show, and the judges note this with fervor — and with an elephant's memory. Late arrivals and no-shows are permanently etched on the Cool Stuff 'Wall of Shame,' and they redouble the judges' efforts to sniff out the vaporware during their subsequent deliberations.

"We may not find every deserving product out there; that gets harder each year. But we try to do our best to find the coolest new things we can at each NAB show for the readers."

Are the judges influenced by advertis-

ing considerations?

"No, other than being made aware of a product they didn't know about through other means, by an ad that they saw before or at the show. But the question of whether a product under consideration is or might become a subject of advertising in RW absolutely never enters the judges' minds.

"They are all end-users of the products, not sales people, so their brains aren't even wired to think that way. That's also why RW staff does not participate in the judging."

How come one company might win several awards and another not one?

"There used to be a rule about one award per company per year, but as mergers and acquisitions have proceeded in our industry, like many others, this seemed unfair — particularly if two unrelated products that happened to be under the same corporate roof both seemed worthy on a given year.

"Nevertheless, there's still an awareness of the appearance of favoritism when this happens, which is something that the judges really want to avoid. So when a company wins more than one award, it really indicates the judges felt strongly that these products were all quite worthy, since they were held to a somewhat higher standard as a result.

"By the same token, if a company didn't win any awards, it simply means that none of their new offerings met the bar that the winners set that year. There are no company-oriented biases in this group — it's all about the products."

What trends or interesting angles do you see, when you look over this year's winners as a whole?

"Well, as I said earlier, the awards are always pretty diverse, and this year's no exception. But if I were to look for any common threads, I'd say there's always some nod toward the 'better-faster-cheaper' trend. There's also a general appreciation of increasing levels of integration, adaptive or 'smart' systems and other things that make engineers' lives easier

## From the Editor



**Paul J. McLane**

and allow their time to be spent more efficiently.

"This year there are also some specific trends indicating a maturation of HD Radio, with 'next-gen' systems implementing the Ibiqity Engine approach, and a proliferation of processing, monitoring and control systems optimized for HD.

"Also, this year I saw the start of a refreshing movement back to serious concern for sonic quality. As HD Radio emerges, terrestrial broadcasters are realizing they have a potential advantage over satellite in the area of audio fidelity — including surround — and the industry's responding with tools that can leverage this."

Some people think you shouldn't be anonymous. Why not state who is on the panel?

"It's kind of like restaurant reviewers maintaining their anonymity. You want to get the same experience that anyone else would. In the case of Cool Stuff judges, many of them are already well known as individuals to vendors anyway so they're probably already getting some special attention. But you don't want to be lobbied hard for the award per se — you just want to hear the pitch for a potential sale of the product, like any other prospective customer.

"I should also note that the makeup of the panel changes somewhat from year to year, so even if a vendor knows — or thinks he or she knows — someone that's a judge one year, that person might not be a judge next time."

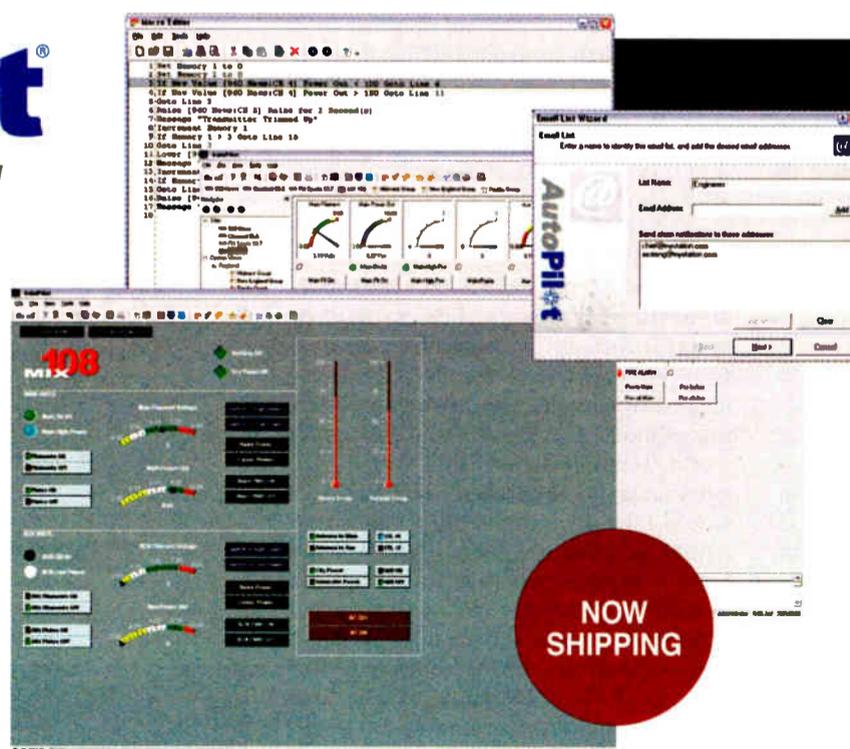


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# NAB2006

► Continued from page 1

## NRSC LOOKS AT BANDWIDTH REDUCTION, SURROUND

Members of the National Radio Systems Committee, a standards-setting group, made decisions affecting AM testing and surround sound testing at meetings at NAB2006.

Frank Foti of Omnia and John Kean of NPR are leading a group testing how some 30 receivers handle AM at different bandwidths, the current 10 kHz bandwidth, plus 5 kHz and 7 kHz.

"Testing is ongoing at all three bandwidths," said NRSC Chairman Charlie Morgan. The tests should be finished this month and a final report with analysis is to be given to the AM Subcommittee in several months.

The point of testing is to determine how receivers will perform at various AM bandwidths with two levels of adjacent-channel interference and whether reducing the bandwidth also reduces interference between first-adjacent AM signals.

The NPR Labs is conducting the tests, Morgan said.

Meanwhile, the task group studying various surround sound systems compatible with IBOC is still trying to determine testing criteria. The group decided all the systems would be evaluated, but not compared to each other, at 96 kbps and lower bit rates, Morgan said. The lower bit rate performance of the systems is of interest to broadcasting multicasting their IBOC signals.

Debate ensued during the meeting in Las Vegas over whether to compare systems to a set of criteria or to each other, and at different bit rates. The group decided to test each of the four surround systems individually at different bit rates, according to a committee source who did not wish to be named.

The committee decided there would be no "shootout" between systems because that's not the task of the group, Morgan said.

Other NRSC members said it's up to broadcasters, not the NRSC, to decide which surround technologies work best with IBOC.

How or whether multipath interference should be part of the test criteria for surround was debated, the source said. However, no industry standard exists to quantify and measure multipath. "It they have to do that, that would become a bigger debacle than trying to figure out what impact on multipath the different surround systems may or may not have," the source said.

## NAB CHIEF EYES OPPORTUNITY

As he opened the show, Rehr said he wanted to avoid talking about past problems facing the broadcast industry or rehashing current challenges. Instead he focused on the direction of the association.

"We need to move away from being seen as an organization that's always on the defensive," Rehr said to immediate applause. "We need to be seen as one that's on the offensive. We shouldn't be protecting the status quo, but need to be an organization that embraces change."

Rehr acknowledged that the broadcast industry is facing its share of competition, from cable and satellite to the Internet. But broadcasting has a solid base of strength that the industry needs to exploit and build upon, he said, and industry can take advantage of that with the onset of HD Radio and HDTV. Promotion of those technologies is imperative, he said.

"Broadcast signals need to go everywhere, to everyone, to every device," he said. "After all," he reminded a laughing audience, "TV and radio were wireless before it was cool."

The industry also needs to more heavily promote the benefits of DTV and HD Radio. Both TV and radio are at the verge of the greatest transformation in history, he said, and many Americans don't truly understand what either of these technologies means.

**TV and radio  
were wireless before  
it was cool.**

— David Rehr,  
NAB President/CEO

At the NAB Broadcast Leadership dinner on the eve of the show, Rehr told attendees NAB will give them "the tools you need to arm yourselves" to compete, although given that this is an election year, "we expect some gridlock" on Capitol Hill.

He said the industry should be committed to electing members of Congress sympathetic to broadcasters. He thanked broadcasters who donated to NAB's Political Action Committee, and said "to those who don't, you'll hear from us soon."

*Rehr's speech at NAB is excerpted at length on page 53.*

## MARTIN: DIGITAL TRANSITION IS FCC PRIORITY

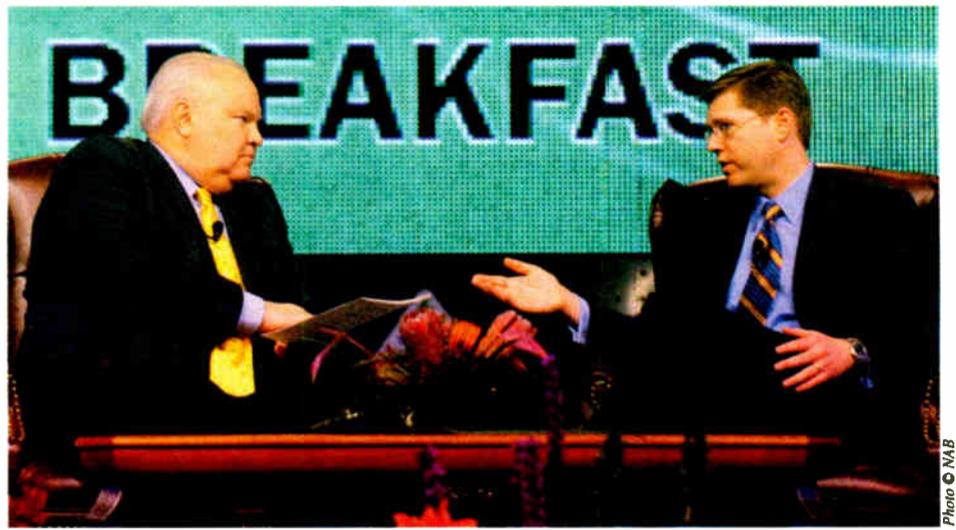
Smoothing the digital transition is a commission priority, for the benefit of both industry and the public, said Kevin Martin in his first appearance before attendees as FCC chairman.

His remarks were made during an interview with NAB Joint Board Chair Bruce Reese, president and CEO of Bonneville International, at the FCC Chairman's Breakfast.

Martin said a major goal of the FCC is to clarify the rules related to the transition to digital, for both TV and radio. Reese said, "You're the one consumers will complain to," referring to the industry's ongoing goal of educating consumers about the DTV transition before the 2009 analog cut-off date.

Martin and Reese discussed two issues specific to radio. The first was the commission's treatment of satellite radio licensees, whom broadcasters believe are creeping toward local services. The radio industry is especially worried about satellite winning local ad revenue, Reese said.

Martin said satellite is envisioned as a



NAB Joint Board Chair Bruce Reese, left, interviews FCC Chairman Kevin Martin.

national service. "The commission has been diligent as far as the satellite providers, to put conditions on their translators," Martin said. "We've put conditions on them in the past and that will continue."

Satellite radio provides a valuable service and will continue to be in demand, Martin believes. Broadcasters' strength, however, is that they provide a local service. "We don't want everything to turn into a national service," Martin said.

## TRANSLATORS DISCUSSED

Reese also asked about what he described as thousands of FM translator

and low-power FM applications pending at the agency, as reported in RW. The two also discussed the question of whether AMs with reduced power at night could apply for some of these translators to fill in their coverage areas.

The FCC is balancing the needs of competing applicants for the same spectrum, said Martin.

"All of these are opportunities for listeners to get information from one of these different sources. When you have competing demands for spectrum, the commission has to prioritize them. Hopefully there will be a way to address it that balances all of those services," he said.

See NAB2006, page 6 ►

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# NewsWatch

► Continued from page 2

Susquehanna Radio from its parent company, Susquehanna Pfaltzgraff Co.

The deal, valued at around \$1.2 billion, was finalized in May. Cumulus is now the second-largest radio group by station count, with 345.

Susquehanna Radio had been the largest privately owned radio broadcasting company in the country. It held 33 stations in eight markets.

Lew Dickey, chairman and CEO of Cumulus, retains that title.

Several Susquehanna personnel told Radio World before the deal closed that they had not been notified whether they

would be retained by Cumulus. A call to Cumulus regarding how many staff, including engineers, would be retained or released after the close was not returned.

## News Roundup

**IN PHOENIX**, Bonneville International agreed to purchase the assets of KKFR(FM) for \$77.5 million. If the sale receives FCC and other regulatory approval and closes as expected within five months, Emmis leaves the Phoenix market. It would then own 23 U.S. radio stations in seven markets.

**EMMIS COMMUNICATIONS Corp.** Chairman/CEO Jeff Smulyan wants to take the broadcaster private. Smulyan's

ECC Acquisition offered \$15.25 per share in cash for outstanding publicly held shares of Emmis. The proposal valued Emmis' equity at approximately \$567 million. The company board formed a committee of independent directors to consider the proposal, which requires board approval.

**SEVERAL GROUPS**, including a manufacturer of Family Radio Service-compatible radios, support the new National SOS Radio Network. During a crisis, ham radio, GMRS and scanner operators can monitor FRS Channel 1 by listening to 462.5625 MHz. When a call for help is received from an FRS radio, emergency responders can be notified, said the companies. Details are at [www.nationalsos.com](http://www.nationalsos.com).



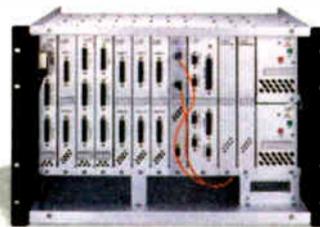
“The South has a lot of ‘favorites’ including barbeque, football and great hospitality. I’m adding Logitek to my list.”

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

“When we built this facility we had four FM’s and an AM. Suddenly, I had four additional HD streams to incorporate into the system. Logitek let me add the additional stations with a minimum of frustration.

“Logitek may not be as high on my list as great barbeque, but it gets my vote for a great audio platform.”

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# NAB2006

► Continued from page 5

## MARTIN RE-NOMINATED AS CHAIRMAN

President Bush re-nominated Kevin Martin for a second term as commissioner and chairman of the FCC in April. Martin doesn't need Senate approval to start his next five-year term, which goes through mid-2011. Martin joined the commission in 2001.

Although Martin has been chairman since March of last year, he has wrestled with major issues without a Republican majority due to the 2-2 party split among sitting commissioners. He has managed to get the agency to focus on broadband deployment and the creation of a new Public Safety and Homeland Security Bureau.

A Senate confirmation of Republican Robert McDowell as the fifth and tie-breaking commissioner remained sidetracked in May.

## DRM LIVE; U.S. BROADCASTERS INTERESTED

At the Continental Electronics booth, attendees could hear Digital Radio Mondiale broadcasts at 26 MHz on Nevada Public Radio, KNPR(FM), Las Vegas. Continental used a 10 kW transmitter and TCI anti-skywave antenna.

DRM is a digital technology developed for use with frequencies below 30 MHz, such as short-, medium- and long-

When you have competing demands for spectrum, the commission has to prioritize them.

— FCC Chairman  
Kevin Martin

wave. Recently, the DRM Consortium decided to extend the system into the FM band, up to 120 MHz.

The consortium is made up of broadcasters, transmission equipment manufacturers, chip makers, receiver manufacturers, licensing organizations, network operators and universities.

Attendees could hear the broadcasts on DRM receivers with DRM, DAB, FM and RDS capabilities. The DRM receivers use the Radioscape RS500 module and Texas Instruments' DRM350 digital radio baseband.

In several seminars at the booth, DRM representatives presented material aimed at broadcasters who may be thinking about DRM implementation.

DRM Chairman Peter Senger of Deutsche Welle told Radio World See NAB2006, page 8 ►



**This is how you feel when you find out  
the remote is this afternoon.**

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# NAB2006

► Continued from page 6

several broadcasters expressed an interest in using the DRM technology in the United States, both local broadcasters who inquired about using DRM for service to U.S. listeners, and broadcast entities sending programming to U.S. listeners from abroad.

While Continental and DRM displayed a Sangean DRM radio in the booth, Senger said Morphy Richards expects to release a combination DAB/DRM radio in August at a price of 199 euros, with more radios to come for IFA in September in Berlin.

Senger noted that chipmaker Philips recently joined the DRM Consortium, looking to include DRM capability in mobile phones. Deutsche Welle recently conducted a test with a mobile phone manufacturer, transmitting a text message via DRM.

## FMEXTRA TOUTED AS AFFORDABLE DIGITAL

The Digital Radio Express system for digitizing FM subcarriers was demoed in an off-air simulation using a prototype receiver at the Energy-Onix booth.

The Idea Bank, a consortium of about 100 radio owners and operators, is discussing the FMeXtra digital subcarrier system, according to Energy-Onix, which represents the Digital Radio Express system.



Equipment for the demo of the FMeXtra system included a DRE encoder and an Energy-Onix FM exciter feeding subcarriers into a prototype FMeXtra receiver.

The Idea Bank meets twice a year to discuss issues that affect the future of radio. It has more than 80 stations interested in the concept.

"They're contemplating it; they haven't put it on. We're providing them with content approaches," Energy-Onix President Bernard Wise told Radio World. He said he's interested in devising national content distribution methods for the DRE system.

His customers, mainly in medium to small markets, are more interested in using his existing FM transmitters and tacking on an additional \$9,000 to digi-

tize their subcarriers, rather than spending the approximately \$100,000 to \$200,000 to go IBOC, he said.

"It's the *only* way they're going to go digital; they cannot realize the return on investment by spending \$200,000," he said.

Wise said the DRE FMeXtra system is an inexpensive and practical way to transmit multiple digital programs. A station using this system can operate in analog stereo or mono. Digitizing the subcarriers and keeping the analog signal in mono affords the station 164 kilobits per second of bandwidth to use while trans-

mitting the analog in stereo affords a station 64 kbps, said Wise.

Asked by Radio World about DRE receiver availability and whether consumers could also hear the broadcasts on IBOC radios, a DRE spokesman said the company was not ready to make a public announcement yet, but hoped to soon.

## WILEY: NAB'S NEW HEAD LOBBYIST

Doug Wiley is the new chief lobbyist at NAB. The announcement came on the eve of the convention.

Wiley becomes executive vice president of government relations. He is former senior vice president of government relations for the Electronic Industries Association, the Competitive Telecommunications Association and the office of former Rep. Thomas Bliley, R-Va. Wiley also worked at NTIA.

NAB has been looking for a new vice president of government relations since John Orlando left in January to return to CBS, where he had worked before joining NAB in 2001.

Soon after new President/CEO David Rehr arrived at 1771 N Street last December from the National Beer Wholesalers Association, NAB hired another beer association alum, Laurie Knight, as senior vice president of government relations. She replaced Andrew Reinsdorf, who left NAB in February. Knight had been director of government affairs for the NBWA. ●

# AM Multiplexed Directional Antenna Systems For The Digital Revolution

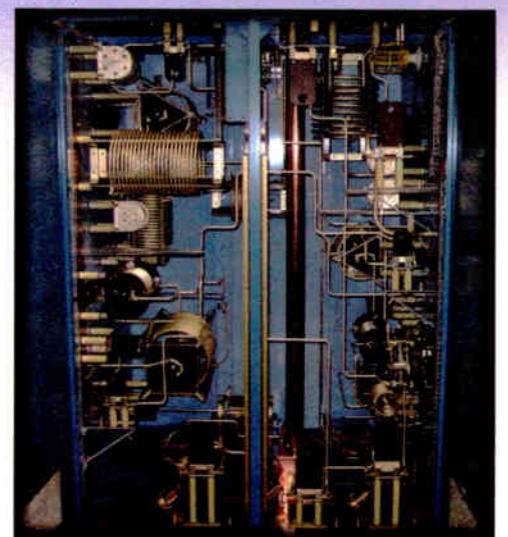


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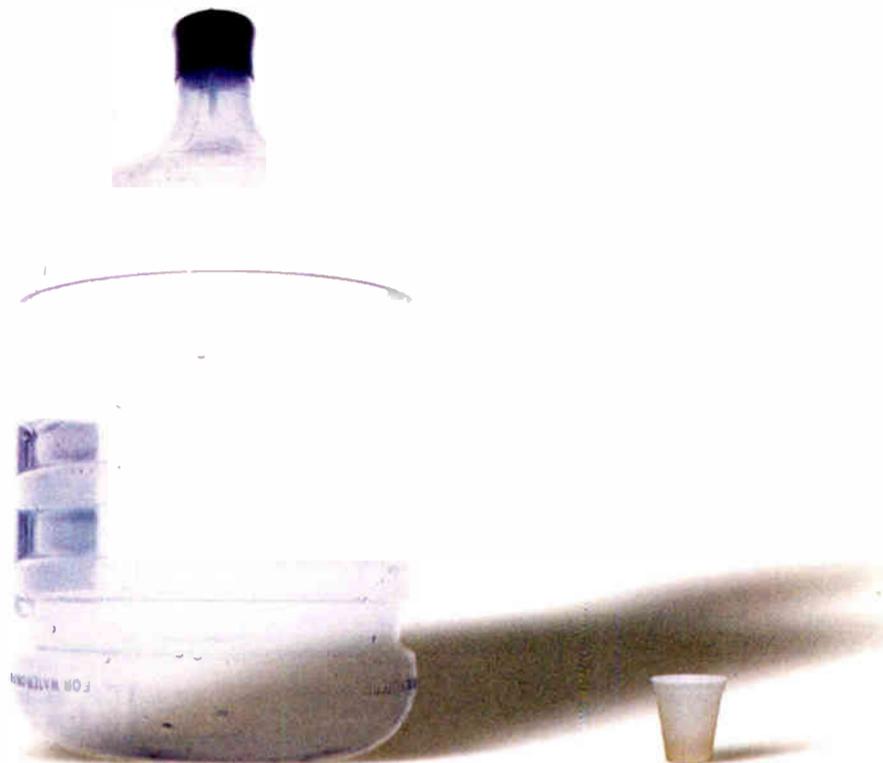


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*Omnia Multicast with SENSUS codec conditioning, Omnia Bass Management system and distributed look-ahead limiter significantly improves the sound of HD multicast and other bit-reduced streams.*

SENSUS technology enhances punch, preserves presence, and reduces artifacts. Even heavily bit-reduced channels (like multicast) can be significantly improved by Omnia running SENSUS. And like all Omnia processors, Omnia Multicast delivers the smooth, clean, pure signature sound that grabs your listeners and holds them hour after hour. No wonder the top stations around the world choose Omnia over all other processor brands.

Multicast like you mean it... with Omnia Multicast.



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# PREA

► Continued from page 1

serve as chair and vice-chair, respectively, of the prospective organization.

## 'Long overdue'

Starling called the formation of such an association "long overdue" and said the group would have the support of NPR Labs, NPR Engineering and the Public Radio Satellite System in working to focus on system-wide engineering priorities.

Yet the membership base would not be limited to those who work at NPR member stations, but open to all public radio station engineers. In preliminary talks, Hogan and Mansergh discussed a requirement that members work at CPB-qualified

stations, but felt that was too limiting. They have proposed using the PTFP language of applicant eligibility. "The goal is to make it as accessible as possible," said Mansergh.

How many members might a PREA represent? Mansergh estimated the number of people directly involved in engineering functions at public stations at roughly 500 to 600. That doesn't include mixing engineers and several thousand others in supporting roles at public radio networks and elsewhere in the industry who could be potential members. The classes of membership to be offered haven't been discussed, he said.

The main goals of PREA would be to plan the annual Public Radio Engineering Conference, currently co-managed by NPR Labs and PRSS; advise and advocate on public radio engineering issues; devel-

op a repository for technical resources for public radio engineers; and establish a training and development program.

While the latter goal might seem to duplicate training efforts offered by the SBE, Hogan said PREA would "in no way compete with SBE. If anything, SBE would be a good support for this organization."

Hogan sits on the SBE's National Certification Committee and served two terms on the board of directors and two terms as secretary.

SBE President Chriss Scherer said the question of whether a PREA would duplicate SBE efforts was one of the first the board asked when briefed by Hogan. "We're waiting to see if the group gets any legs" before saying much about it, Scherer said. He said he sees the potential for the groups to work together on some issues.

Something the group would not do is function as a union, its organizers say. PREA's role would be to support members in their work through information, communication and collaboration, and to encourage a new generation to join the profession through outreach and educational opportunities, said Mansergh.

"If an issue were significant enough to warrant the organization taking a position and advocating a particular outcome, it may well do that, but that would not be its primary function. Direct work with station managers would be rare (and) project-related; and PREA would not act as advocates for specific members in negotiations like a union," he said.

## 'One voice'

The PREA concept appeals to at least some public radio engineers.

John Holt, director of engineering and operations for WAMU(FM) in Washington, said, "As a 34-year veteran of public radio I would like to see the public radio engineering fraternity speak with one voice as an independent organization representing the smallest stations and the largest organizations.

"I know that there is concern about the need for another organization with overlapping membership and agenda," he con-

**I would like to see the public radio engineering fraternity speak with one voice, as an independent organization representing the smallest stations and the largest organizations.**

— John Holt,  
WAMU(FM)

tinued. "But the needs of public radio engineers are different from commercial radio engineers and from television engineers. This doesn't take away from one organization or another but adds to the knowledge base and provides for more input, a unified input, on the issues before the broadcasting community."

Any training offered by PREA would be specific to public radio engineering's needs, Mansergh said.

Offering an example, he said, "One of the key things we're talking about: As we look at the ContentDepot rollout, the level of expertise between stations is unbalanced."

PRSS has conducted training seminars and published a great deal of material on how to implement its impending updated program distribution method, but some stations will need more help than others to implement it.

Mansergh mentioned a public radio station on an Indian reservation in Northern

See PREA, page 12 ►

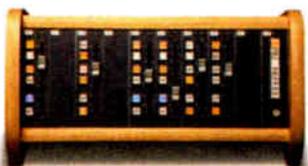


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**New RIOGrande Stand-Alone Mixer/Router** — RIOLink, the SAS Remote I/O chassis for the 32KD, has grown into a full-featured stand-alone mixer/router, a junior version of the 32KD. Use it with Rubicons, SLs, Rubi-Ts, or simply as a powerful 32x32 analog and digital router. Connect two RIOGrandes with CAT5 or fiber for a great 64x64 mixer/router system.

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# PREA

► Continued from page 10

California that his station has helped connect to the satellite distribution system. Right now, without an engineering association to help, such a station would simply find ContentDepot gear showing up on their doorstep — the interconnected station wouldn't know what to do with it, he believes.

"They've got to have some support. There's a lot of expertise here and a lot of people willing to help all over the country."

## Technical repository

PREA initially would post material on the NPR Labs Web site and possibly eventually have its own site, Hogan and

Mansergh said. A site could include archived material from a public radio engineering list server to form a repository of technical information, said Mansergh.

A PREA also would help nurture the interests of younger people interested in engineering for public stations, said Hogan. Mansergh thinks the group might serve as a single source of help for CPB scholarship applications to the PREC convention, rather than the current set-up, in which NPR Labs and PRSS both handle that function.

The PREC convention, begun six years ago after the demise of the Public Radio Conference, has grown from 97 participants to more than 230 this year. Twenty-five of those were CPB scholarship recipients.

If formed, PREA would assist in planning that convention next year and possi-

bly take over that function within two years. Both Hogan and Mansergh said starting the conference planning earlier is a priority.

An advisory group that includes 20 station engineers helps plan the PREC. (Radio World Engineering Extra Technical Editor Michael LeClair, chief engineer of the WBUR Group in Boston, is a member of the advisory committee.) It's hoped the members of the advisory committee would form the core of PREA, and membership would build from that point.

Hogan has two TV stations and 13 radio stations under his purview at Northwest Public Radio and is on the PBS conference planning committee. He sees "synergies between the two groups we could capitalize on. There are a number of joint licensees who would like to

go to both."

The PREC shared space with the PBS convention this year (see conference highlights, page 26).

Hogan stressed that the group faces many decisions and obstacles. It needs volunteers and would have to settle grittier questions such as a board and dues.

Of 50 surveys filled out at the PREC by participants, 49 said an association is a good idea. The one who was opposed felt the new group would duplicate efforts of the SBE, said Hogan.

Hogan and Mansergh planned to poll a wider group of public radio station engineers by the end of May, to gauge interest, and possibly begin forming committees to work on the groups' basics, such as bylaws. More information about the group was expected to be available on the NPR Labs site ([www.nprlabs.org](http://www.nprlabs.org)) by early June. 

## Clear Channel Offers HD2 Content

Clear Channel Radio is creating programming for some 75 new HD2 and other distribution channels and making it available for sale to other radio broadcasters.

The exact financial terms vary, said the company, depending on the programming and delivery method.

The broadcaster said it was too soon to gauge interest from other radio groups, but a source close to the issue said reaction so far had been positive.

The audio, video and text programming will be the foundation for HD2 channels as well as Internet streams, station Web sites, iPods, satellite broadcasts and in-vehicle navigation systems, Clear Channel said.

The company's Format Lab will head the effort. It created the lab in 2004 but only began publicizing it this spring. The lab is co-led by Tom Owens, Clear Channel Radio's executive vice president for content, and Evan Harrison, online music and radio chief.

### Non-professional programmers

It is made up of more than 200 programmers and production specialists; some work for Clear Channel Radio full-time while others are part-time. Not all Lab employees are professional programmers by day. Employees are developing unconventional radio and online content, irrespective of what devices ultimately carry it, company officials said.

"We have become agnostic about delivery and are completely passionate about content," said John Hogan, president and CEO of Clear Channel Radio. "And we'll continue to lead the radio industry on to new platforms. Our power to connect with, and hold, consumers will continue to reveal itself as we supplement our outstanding AM/FM properties with programming for new devices."

Live streams channels can be heard at [clearchannelmusic.com/formatlab/](http://clearchannelmusic.com/formatlab/).

The Format Lab, Clear Channel says, asked non-professional radio programmers to lead or consult on some channels. Examples include a personal trainer consulting on workout channels; a Broadway veteran programming the lab's show tunes channel; and an information technology expert driving the lab's Americana channel. Part of the goal is to achieve diversity of programming in unconventional ways.

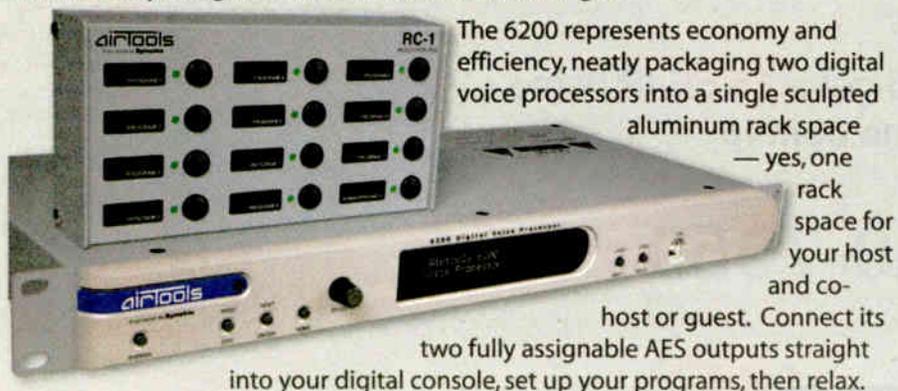
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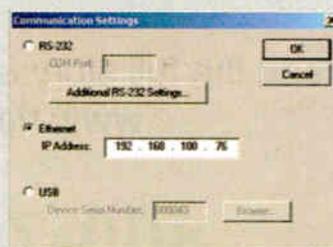
How do you get consistently great sound out of one microphone used by many different voices during the course of a day? Customized processing for each voice. The 6200 offers complete, real-time digital processing for microphones from a Windows PC or from the front panel. This allows each voice to have a completely unique sound which can be saved as one of 256 programs then recalled from the front panel, the RC-1 desktop remote, over a LAN, or automatically using the unit's on-board event manager.



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Radio World, June 7, 2006

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

# Time Alignment and the Receptor

by John Bisset

There are a lot of Boston Acoustics HD receivers out there now. Cris Alexander, director of engineering for Crawford Broadcasting and a fellow RW contributor, passes on a procedure that should be useful.

He obtained this procedure from friends at Clear Channel. It permits placing the Boston Acoustics Receptor Radio HD into the "split mode" for adjusting time-alignment of the digital and analog signals.

To get into "split mode" turn off the radio and turn it back on until the frequency is displayed.

Hold down the CLOCK button for about 5 to 10 seconds.

You will see a list of items displayed. Scroll down the list using the frequency knob on the left, until you come to SPLIT MODE. Now press the Frequency knob.

Scroll up to SPLIT MODE ON and press the knob again. A note, make sure you have the volume where you want it before going into this mode, because the volume control will be disabled.

The Digital channel should be in the LEFT channel and the Analog channel in the RIGHT channel. Of course, you'll need the optional stereo speaker in this mode, or you can use the rear-mounted stereo headphone jack.

To get out of this mode, scroll down to SPLIT MODE OFF, and press the Frequency knob again. Cris Alexander can be reached at [crisa@crawfordbroadcasting.com](mailto:crisa@crawfordbroadcasting.com).

\*\*\*

We exposed Entercom Scranton's Bob Drazba in the March 16 column as "King of the Remote Cases." You may recall that Bob found inexpensive yet rugged tool cases that were deep enough to hold remote gear at his local Home Depot.

Fig. 1 shows Bob's cache of color-coded cases, ready for their busy summer remote season. Thanks, Bob, for encouraging our readers to "professionalize" their departments by graduating from cardboard or plastic "postal" boxes.

Still having difficulty getting management approval? Suggest that they can charge more for a remote when the technician shows up with neat cases instead of cardboard boxes.

\*\*\*

Speaking of cardboard boxes: We occasionally spotlight engineering ingenuity in this column, and Fig. 2 speaks volumes. No case for the monitor speaker? Why not use the box the speaker came in?

Don't you love the on/off switch and the pencil-created holes "drilled" in the cardboard grill cloth? I heard it, and it *does* work! But of course, no names.

\*\*\*

I'm still getting comments about the transmitter solenoid breaker reset, originally shown in the Feb. 1 issue. Though similar breaker reset schemes have been used, here's a story with a happy ending.

Many years ago, Boston's Grady Moates of Loud And Clean was much further south. He had an HV breaker problem on a Collins 20V3 1kW transmitter. The breaker would trip for no apparent reason, and someone would have to drive to the transmitter site to reset it. The transmitter would work fine for a month or more, and then trip again.

The solenoid solution worked fine for the station for eight or nine years, long after Grady left the station. One day, he was contacted to come back to the station as a contractor, and one of his duties was to clean out the transmitter.

In the process of thoroughly cleaning and inspecting the rig, Grady found a dead, crystallized, carbon-traced moth, sitting on top of the G6 glass-epoxy used to hold up the RF tube plate connections to the parallel PA tubes. The moth had been there for a decade, hiding behind the threaded standoff used for the RF/DC feed, where you couldn't see it without a mirror.

Grady pulled it out, and then immediately pulled the solenoid reset, telling his client they'd not be needing it anymore. Grady muses that if he had found the moth 10 years before, the solenoid arrangement would never



Fig. 1: Inexpensive, heavy-duty cases keep remote gear organized.

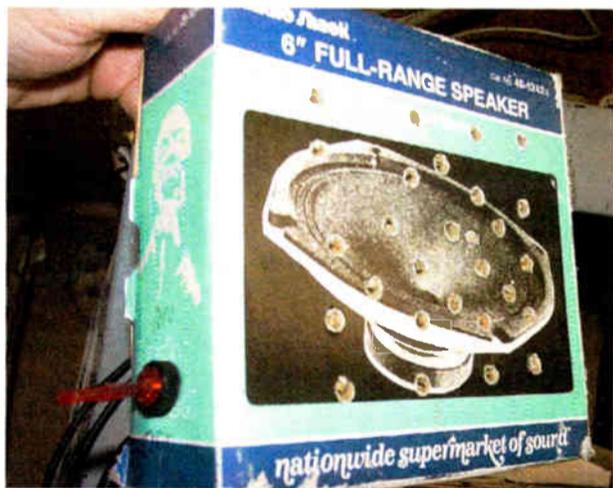


Fig. 2: Speaker box?

have been necessary.

The lesson to be learned? There's always a good reason for behavior of the equipment. Just have to be smart enough to find it.

Grady Moates can be reached at [grady.loudandclean.com](http://grady.loudandclean.com).

\*\*\*

See WORKBENCH, page 16 ►

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Like all Axia products, Element does more and costs about half what others try to charge for their "Trust us, this is better than Ethernet, would we lie to you?" stuff.

Element. Worth its weight in... well, you know.



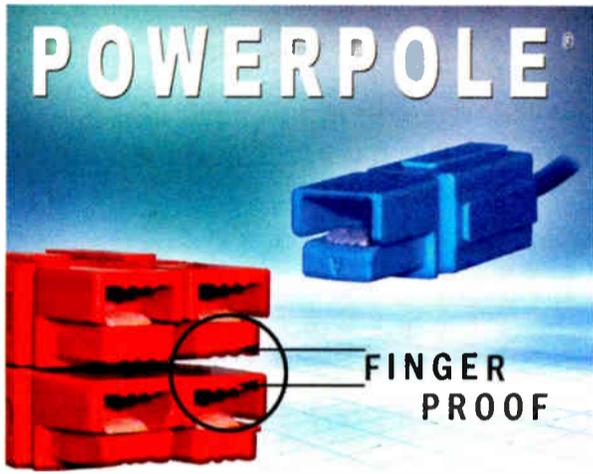
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MARKET PLACE

## Powerpole Comes in Standard, 'Finger-Proof' Versions

Anderson Power Products makes the Powerpole 15/45 Connector, which it markets as a "genderless connector system that provides a simple, low-cost solution for power interconnection."

The APP Powerpole 15/45's interchangeable design allows quick assembly while minimizing the number of parts stocked. Molded dovetails secure connectors into keyed assemblies, preventing misconnection with a similar configuration. Color modular housings provide visual identification for the proper mating connector.



The finger-proof connector minimizes potential finger access when the connector is unmated and energized. The feature was designed for safety in applications in which access to the energized connector is not otherwise protected. A flat-wiping contact system reduces contact resistance at high currents; the wiping action cleans the contact surface during connection and disconnection.

The connectors meet accessibility protection requirements of IEC IP20 and UL1977 sec 10.2., and are rated 15, 30 and 45 amps for 600 volts of continuous AC or DC operation. Wire sizes range from #10 to #20 AWG (5.3 to .5 mm?). Low-detent contacts are available for applications requiring low insertion/withdrawal force. Contacts are available reeled and in loose piece designs.

For info call the company in Massachusetts at (978) 422-3600 or visit [www.andersonpower.com](http://www.andersonpower.com).

## Lindos Has Online Audio Test Database

Lindos Electronics in the United Kingdom launched an Audio Test Results Database, which it calls a way for users to share performance results for any piece of audio equipment. Access is free.

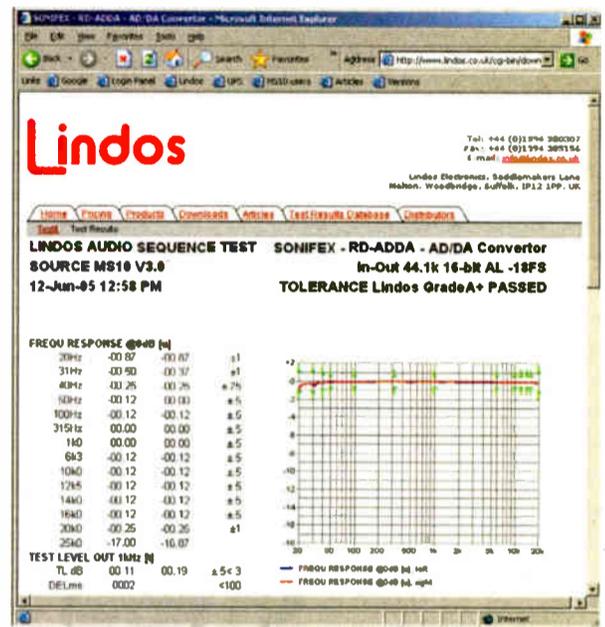
The company makes test equipment. Company executive Chris Skirrow put out a statement saying, "I'm tired of the meaningless specs put out by manufacturers and the woolly, subjective product reviews that I see so often. It's time to bring the science of quality measurement back to the forefront when talk-

ing about the products we buy."

Test results are at [www.lindos.co.uk/tests](http://www.lindos.co.uk/tests).

The company promotes its own testing system that quantifies performance of audio equipment in terms of frequency response, noise, distortion, phase, crosstalk and headroom in less than 30 seconds. Results are presented on screen with text and graphs for performance grading using a Lindos defined grading scheme. Results appear on the online database along with any comments the user chooses to make.

Various audio products including headphones, receivers and other gear are listed.



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  - Up to 4 cards in one system
  - Windows 2000, XP and Linux software drivers

BUILT FOR BROADCAST



## Workbench

Continued from page 14

It's rare that engineers have time to build anything any more, but when a client need arises, it has to be considered. Bill Weeks of Hungry Wolf Electronics had a client who needed a remote transmitter panel. The station was on a budget, and it just didn't make sense to purchase and install a

could move the decimal point to the appropriate location for each switch position.

The particular DPM panel meter that Bill selected runs on 110VAC. He adds that it might be better to get a similar one that runs on something less lethal, but he couldn't find that model in the McMaster catalog, and the panel needed to be completed quickly.

The project took about three hours to build, but the construction time could



Fig. 3: A simple remote transmitter meter panel.

dial-up remote control for a nearby transmitter.

Bill turned to [www.mcmaster.com](http://www.mcmaster.com) and ordered a Simpson M235 digital panel meter (McMaster part number 8339T9), 0-2VDC for \$95.76; a couple of "Mighty Mite" pushbutton switches (part 5374T111 and T112 — different colors); three 10-turn 10K pots for calibration purposes (part 7436K313); and one rotary switch (part 6548K23). The rack panel and barrier strip came from Bill's junk box.

It turns out that the meter decimal point can be set with a jumper. Bill adds that if he were doing it again, he would use a multi-section rotary switch, so he

have been halved if not for the close tolerance rectangular hole needed for the meter. There's no rushing that, and having it look nice.

The finished product is seen in Fig. 3. Bill Weeks can be contacted at [bill@wolftron.com](mailto:bill@wolftron.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@broadcast.com](mailto:jbisset@broadcast.com). Faxed submissions can be sent to (603) 472-4944. Submissions for this column are encouraged, and qualify for SBE recertification credit.

# “Showcase studios take time, right? Not this time.”

“Challenging’ didn’t begin to cover it. Our showcase studios were to be located in the high-visibility West Edmonton Mall. With only six



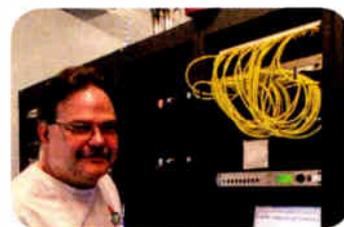
weeks ‘til our on-air date, our challenge was finding a manufacturer we could trust to deliver on our timeline.

“We’d almost decided on one of the traditional console/router companies; working 25/7, we could barely make our deadline.



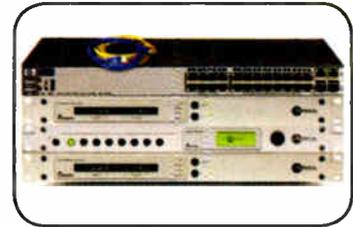
Then we found out about Axia IP-Audio networks.

“Axia gear goes together with RJ-45 connectors, so adding sources to the network takes almost no time. A few clicks and you’re done! That produces a substantial cost reduction in terms of wiring from room to room.



“And because the Axia system routes audio using ordinary Ethernet instead of expensive mainframes, the ease of adding to the network allows it to grow and change dynamically with our operations.

“When we decided to go with Axia, the router guys had a fit. They actually tried to tell us that the IP-Audio network would catch viruses! We laughed for days about that one.



“Our studios were finished with time to spare. The installation came together really well, and since going on the air we’ve been trouble-free.

“We’ve had several announcers tell us how much they love working with the Axia surfaces and how easy they are to operate. It’s great to be able to setup and save multiple configurations that can be recalled at a moment’s notice.



“Our experience with Axia has been all positive; we’ve had no audio glitches or dropouts whatsoever. I don’t know why we hadn’t gone this route earlier. Where we’re installing new equipment, we’re onboard with Axia.”



— Owen Martin, Director of Engineering,  
Newcap Radio, Alberta, Canada



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

# Insurance: Ask Lots of Questions

by Paul Kaminski

There are various ways a station can incur loss. Some are obvious, some not so; and some are common to all businesses. Managers should learn to ask questions about their vulnerabilities and establish relationships with insurance professionals before crisis or loss hits.

Insurance for a tower presents a special kind of challenge. Beacon Insurance of Chicago, for instance, provides coverage under a communications coverage form, which, according to Vice President for Corporate Communications Carmen Duarte, covers risks for direct physical loss. OneBeacon's additional available coverages include retuning of towers, debris removal, expediting expense and business income, which covers loss sustained from the necessary suspension of operations during the period of restoration from any covered cause.

Libel and slander insurance is important to the protection of the revenue stream. Glenna Dake, vice president of First Media in Kansas City, which is part of OneBeacon, says a typical policy written by her company covers "scheduled media" for any form of dissemination, i.e., print, broadcast or electronic.

"We also will consider scheduling the Web sites to the policy, as there may be

content on the site that is not part of 'scheduled media.' By doing this, the insured then has complete coverage for their media exposures," she said.

"What we cover depends upon the type of risk. If the insured is a broadcast station, we would cover all programming broadcast by that station unless there were something that was unacceptable from an underwriting point of view; then that exposure would be carved out in an exclusionary endorsement. If the insured is a program producer, then we would cover only the programs being produced by the insured."

The National Association of Broadcasters offers members extensive coverage through the Hartford Companies for everyday and radio-unique risks. These include property and casualty; automobile insurance; workers compensation; umbrella liability; employee benefits; special coverage for towers, mobile equipment, business travel and computer equipment; directors and officers liability; and commercial general liability.

NAB Senior Vice President of Corporate Communications Dennis Wharton says the program generally is more popular with smaller operations, "providing a valuable service for small-to-mid-market membership." The NAB also has a relationship with Media/Professional Insurance in

Kansas City for libel insurance.

Managers must ask questions before deciding what level of insurance is appropriate for their operation.

## Talking

What can be done to minimize risk to an acceptable level, given that all human activity in one way or another is risky? Chris Shepard, underwriting account manager at Media/Professional Insurance, encourages that "best practices" be implemented.

Using the example of libel/slander coverage, Shepard said, "A station can implement certain things such as a delay, which would help reduce the risk of something inadvertently being broadcast. Stations can consult with a law firm or a risk manager to review their procedures, hold loss prevention seminars for their on-air talent to identify the risks of broadcasting and make sure all musical rights and licenses are obtained for any content they plan to stream over their Web site.

"Pre-broadcast legal review of content is also very important in reducing the exposure faced by broadcasters, especially for news and other original programming." This, of course, may not be practical. So staff training is important, as is discussion ahead of time about what type of material, if any, should be subject to legal review.



and checked and maintained at regular intervals. Buildings and contents should be protected by properly maintained fire, smoke and theft alarm systems."

Dake of First Media says managers should consider claims that may need to be made under a libel and slander insurance policy before agreeing to coverage. Also be sure to understand exactly what you are buying.

"Is the insurance on an 'occurrence' or 'claims-made' form? If it is on an 'occurrence' form, there would be coverage for any covered claim arising out of an

## Radio managers and engineers should talk — among themselves, then with insurance advisers — about these issues.

Mechanical, electrical and operational aspects of a station operation must be considered. Duarte of OneBeacon said stations should implement regularly scheduled maintenance by qualified parties; have protective devices in place and maintained; involve management in decisions about safety; safeguard covered property; and create contingency plans to continue operations in case of loss with minimal interruption.

Maria Moreno, senior vice president of Aon Association Services in Washington, said basic precautions can help reduce risk and premiums.

"The station should have a regular vehicle maintenance program in place. For vehicles carrying expensive equipment, they should have alarms installed that are regularly checked to ensure that they are operational. Check the motor vehicle reports of all assigned drivers at least on an annual basis and have disciplinary procedures in place for those drivers that do not meet certain driving expectations.

"For property and inland marine — which includes portable but not permanently attached equipment in vehicles — and computer equipment coverage, all property should be in good working order

'occurrence' which occurred during the policy period, regardless of when the claim is made — i.e., after the policy has expired," she said.

"If it is on a 'claims-made' basis, the wrongful act or occurrence must take place and be reported to the insurance company during the policy period. Once a claims-made policy has expired, there is no further coverage for acts taking place during the policy term unless the coverage is either renewed or an extended reporting period is purchased; (extensions) are usually only for one year," she continued.

"Since some states have three-year statutes of limitations for defamation claims, the claims-made policy could either hold the insured hostage for three years or it could leave the insured 'bare' for that last year of exposure."

Some questions can be answered only by station decision-makers: How deep are your pockets? Will it cost less to assume the risk for loss or damage from your own budget, or is it more economical in the long run to buy insurance to do that? How much is enough?

Radio managers and engineers should talk — among themselves, then with their legal and insurance advisers — about these questions.

The author is a Radio World contributor and news director for the Motor Sports Radio Network. He contributes reports to CBS News Radio.

## More Info

Web sites of interest:

NAB: [www.nab-aon.com](http://www.nab-aon.com)

Media/Professional Insurance: [www.mediaprof.com](http://www.mediaprof.com)

OneBeacon: [www.onebeacon.com](http://www.onebeacon.com)

First Media: [www.firstmediainc.com](http://www.firstmediainc.com)  
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# Insuring Your Contract Business

by Tom Osenkowsky

Home-based businesses — such as those of contract engineers — don't face many of the concerns of office-based companies. Dress code, parking availability and rigid schedules are parts of the daily routine in most offices that home-based engineers may avoid. But one concern a home-based business must address is insurance.

Typical homeowner policies generally do not respond to business-related insurance needs and protections. These include business personal property — which might include oscilloscope, spectrum analyzer, impedance bridge, DVM, FIM, audio generator/analyzer, etc. — general liability, professional liability, business auto liability and workers' compensation.

Business Income Protection coverage will replace actual business losses and special expenses that arise from fire, theft or other covered event.

**Acts of negligence, errors or omissions can cause a client to lose a considerable amount of income. Insure yourself and your company against such claims.**

Professional Liability is perhaps the most important coverage for a business. It protects against errors and omissions — "E&O" — and may include coverage for legal expenses. What scenarios may be covered by Professional Liability insurance?

- ✓ Advice dispensed at a seminar that turned out to be faulty.
- ✓ Specifying a transmitter that required three-phase power where the site is only serviced by single-phase.
- ✓ Specifying FM antenna height or number of bays that failed to satisfy the client's expectations.
- ✓ Accidental disclosure of confidential information to a third party that resulted in a loss to your client.
- ✓ An application rejected by the FCC for inaccurate information contained therein.

General Liability policies typically cover physical damages to persons or property caused by faulty equipment, facilities or products. They also cover negligent acts that cause third-party injury or property damage — for example, dropping a part or tool, causing damage, destruction or personal injury.

Homeowners' policies do not cover any of the above.

A contract engineer may have a sizeable investment in equipment that is specific to the trade. Field intensity meters, impedance bridges, audio generators and

analyzers, spectrum analyzers, network analyzers and other instrumentation would not be insured under a homeowners' policy.

### Claims made

Professional Liability insurance policyholders must consider the "claims made" provision in most policies. This states that the policy must be in effect at the time the claim of liability is made, not when the negligent event occurred.

Let's say a contract engineer adjusted an ATU and claimed the input impedance was "broadbanded." While this definition may have been true for standard mono +/- 10 kHz audio, the load may not be

satisfactory for the more stringent requirements necessary for AM IBOC operation. Let's say further that the problem is discovered while the policy was in effect but the lawsuit is filed after coverage expires. This lawsuit would not be covered even though it was in effect while the work was considered complete and the deficiency discovered.

To guard against such claims, many policies offer an extension for the "tail" of the policy at a prorated premium after the original term of the policy.

Many clients now insist on insurance coverage, and proof thereof must accompany bids or be presented in advance of commencing work. Typical coverage

amounts start at \$1 million. If you have subcontractors or employees, your insurance needs may extend to medical and workers' compensation policies. If you have employees, discuss your needs with an agent who is familiar with policies and underwriters that can address all your needs, given the services you offer and provide.

Acts of negligence, errors or omissions can cause a client to lose a considerable amount of income. Insure yourself and your company against such claims.

Information in this article was obtained from MIMS International, [www.mimsintl.com](http://www.mimsintl.com), which offers PROINSURE E&O and PROBOP Business Owners Package insurance policies and SBE-sponsored plans for members. Members are underwritten individually. For information call (800) 899-1399.

The advertisement features five images of radio station logos and their corresponding hosts. Each image is labeled with 'X100-HD2' and the station's format:

- X100-HD2 news talk**: A man in a dark shirt and headphones.
- X100-HD2 latin**: A woman in a black top and skirt.
- X100-HD2 local sports**: A person in a white and black sports jersey holding a helmet.
- X100-HD2 country**: A man in a blue shirt playing a guitar.
- X100-HD2 classic rock**: A woman in a green jacket playing a guitar.

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# The Value of a Clean Windshield

## Negotiating the Road Ahead Requires A Long, Clear View

by Skip Pizzi

In a fit of spring cleaning recently, I came across several items that I had considered miscellaneous. But when I saw them all piled together, I realized they shared a common and important thread.

So like being able to buy a pizza with the coins you find in your couch, the exercise collected a surprising booty. Here's what I found:

### The other PPM

Back in the day, PPM meant Peak Program Meter — a peak-reading alternative to the VU meter used to measure audio levels — but today it refers also to Arbitron's *Personal People Meter*, the latest advance in radio audience measurement. Actually, it's about the *only* advance in audience measurement since the invention of the pencil.

It's always fascinated me how a station's fortunes can rise and fall on statistical variations that are well below the margin of error for the research, but even more amazing is how this data is still collected. As others have observed, the diary system isn't a measure of audience listening, but of the audience's *memory* of what they listened to. So fraught with error is this process that it has survived only because it was critically necessary and there was no practical alternative.

In the digital age, measuring audiences via paper diary reminds me of the old Saturday Night Live routine "Amish in Space." The PPM is a welcome change, and long overdue.

What we will all watch with interest soon is how much the data changes when actual listening is more accurately reported, how business practice adapts to these shifts, and whether the industry is ultimately helped or hurt in the process. (Overall, I think the PPM will reward stations that are working hard to serve their audiences well, and hurt those that are coasting on momentum from their glory days — but that's just a guess.)

### DAB vs. IBOC

International digital radio format wars are also heating up. DAB (formerly known as "Eureka -47") has languished in most of the countries that have introduced it, except for the U.K., where it has taken off strongly in the last two years or so. Meanwhile, IBOC has begun its launch in the United States.

Both formats are potentially viable worldwide (HD Radio has been approved as an ITU standard), and there are many countries that have not yet decided on a digital radio format. There are even some who *had* made a choice that are now reconsidering.

Witness Canada, one of the earliest and staunchest supporters of Eureka 147. After broadcasters' investment of much time and effort in DAB deployment and evangelism, the format has had no popular uptake — primarily due to lack of receivers, but also because no new content was offered. (Canadian DAB was always envisioned as replacement, not enhancement, to AM and FM broadcasting there.)

Now Canada has announced the start

of official government and industry testing of IBOC digital radio, as a likely prelude to rulemaking procedures. Expect to see other countries follow the Canadian example.

But DAB is not dead yet. The format is undergoing its own revisions, with numerous enhancements under development by the WorldDAB Forum, its caretaker body. Meanwhile, its success in the

## In the digital age, measuring audiences via paper diary reminds me of the old Saturday Night Live routine 'Amish in Space.'

U.K. continues to grow, with new spectrum allocations for more stations and high receiver sales volume indicating ongoing consumer demand.

The next few years will be interesting to watch on the international terrestrial digital radio battlefield.

### Copyright's crazy quilt

We've spent a lot of ink lately on copyright issues as they apply to radio and the music industry, and how law is constantly chasing technology there. At the fringe of this debate is perhaps the most telling issue on the depth of change underway.

For lack of a better term, call this area "reuse" (or "republishing"). It involves the incorporation of one person's published work into the published work of another. While this is in itself not new, past instances have generally involved some sort of "adaptation" of the original work, usually with credit given to the original's creator, and almost always with the per-

mission of — and perhaps even a negotiated arrangement with — the originator.

On the other hand, today's technology allows *everyone* to do this, by making *exact* copies of such extracts, reusing and republishing them on a massive scale, and without necessarily obtaining permission of the originator. While the most egregious cases of this would be likely found illegal, there is a growing gray area

that affects many legitimate artists who sample the works of others frequently in their product. In music, this occurs most notably in the hip-hop environment, but it also appears in the work of visual artists and writers.

One recent example has been dubbed "reblogging," where a weblogger takes content from another blog to include in his/her blog. This is generally not done with a purely plagiaristic motivation, but in a creative sample-and-remix fashion, much like one might make a mix tape. But rather than keeping that tape for personal use, the reblog is itself a published work.

Taken to its extreme, the level of impact that this new activity has on copyright is staggering. It also blurs the line between so-called "user-generated content" and "regular" (professional?) content.

This examination shows how copyright itself has almost become an anachronism. It was developed at a time where all content was centrally con-

## The Big Picture



Photo: Gary Hayes, BBC

by Skip Pizzi

trolled and distributed, and today we live in an increasingly disintermediated world. Copyright laws obviously need to change with the times, but in fundamental ways, not with the Band-Aids and highly granular prop-ups that a lot of current legal actions propose.

To this end there are a number of projects in play, such as the licenses developed by Creative Commons, and the efforts of the Future of Music Coalition to standardize sampling rights for musicians. But in general, this area remains unsettled.

### Temporary ingravty

That's when it hit me. These are just a few examples of many important issues affecting radio broadcasting that are all in flux right now. It's as if the digital era somehow shorted out radio's gravity generator, and things started floating away. We're all waiting for the gravity to come back on, but when it does, all these things could land in different places and with changed orientation.

At that point, the radio industry will likely have a new landscape under its wheels — one that may require some retooling to successfully navigate, along with an up-to-date map, and a keen view of the road.

Skip Pizzi is contributing editor of *Radio World*. 🌐

### MARKET PLACE

## Harris HT-HD+ Are Expected To Ship in June

Harris announced the first sales of its new HT-HD+ tube-type HD Radio transmitter. They were sold to Clear Channel's FM stations WCOL in Columbus, Ohio, and KRFX in Denver.

The HT-HD+ was introduced at NAB2006. The company said the product marks its foray into the HD Radio market with high-power tube-type transmitters; Harris had offered only solid-state transmitters for the high-power market until now. The unit starts to ship in July.

The company said its Real-Time Adaptive Correction is a non-linear, digital adaptive precorrection technique developed to correct non-linearity in the Inductive Output Tube stage of the Harris SigmaCD DTV transmitter. RTACT precorrection is now implemented in the Flexstar HDX-FM HD Radio exciter, which is "ideally suited to correct the tetrode tube used in the Harris HT Series of FM transmitters," the company stated.

Harris' Geoff Mendenhall said RTACT will permit these transmitters "to achieve

higher output power with greater efficiency than any other vacuum-tube HD Radio transmitter on the market. Initial tests indicate the HT-HD+ transmitter will produce well over 20 kW of common amplification FM + HD power output, with a significant margin on the required RF mask." Mendenhall is overseeing the design and led a team that modified a Harris HT Series transmitter to operate in a more linear mode.

"We linearized the IPA and re-biased the final tube before verifying the amplifier's stability while operating in linear mode," said Mendenhall.

For information call Harris in Ohio at (513) 459-3400 or visit [www.broadcast.harris.com](http://www.broadcast.harris.com).

## QuickTest Is for Play-Only Devices

Audio Precision has released an application for testing MP3 players and other devices lacking inputs with the company's audio analyzers.

It's intended for production-line quality assurance or for labs that need quick, accurate audio testing. The application measures DC off-

set, output level, distortion, frequency response, phase deviation, noise and crosstalk. The software "allows anyone to operate world-class audio analyzers when testing MP3 players, CD players and other personal audio equipment," AP stated.

Announcing its QuickTest application, the firm said: "With sales of personal audio devices forecast to double or even quadruple in the next five years, fast, accurate testing is a crucial competitive differentiator in the consumer electronics industry."

For information call the company in Oregon at (800) 231-7350 or visit [www.ap.com](http://www.ap.com).

Test Description	Measurement	Pass/Fail
Left DC Offset (V)	0.0001655793	Pass
Right DC Offset (V)	0.0002955784	Pass
Left Output Level (dBV)	-18.0198226217	Fail
Right Output Level (dBV)	-18.0003140132	Fail
Left Frequency Response Deviation (dB)	2.5917539614	Pass
Right Frequency Response Deviation (dB)	2.5908080938	Pass
Phase Deviation (deg)	0.0878906250	Pass
Left Distortion and Noise (dB)	-75.7491754611	Pass
Right Distortion and Noise (dB)	-75.6339046224	Pass
Left Noise in the Presence of Signal Ratio (dB)	77.2884195647	Fail
Right Noise in the Presence of Signal Ratio (dB)	77.1554503891	Pass
Left Crosstalk (dB)	-77.1819294765	Fail
Right Crosstalk (dB)	-78.7275893180	Pass

## Audioarts D-16 Digital Console

Save like never before on your new digital console!! Now only \$7,399 at BSW!!! The Audioarts D-16 16-channel console combines the benefits of a router and audio console into one cost-effective digital package, letting you route any analog or digital input to any fader or monitor feed with inputs clearly shown in bright LED dot matrix displays right above the faders and monitor controls. With 24-bit A/D-D/A I/O and sample rate converters on every AES digital input, the D-16 will work with virtually any digital source gear. Its DSP digital metering simultaneously displays VU columns and peak hold. Powerful caller tools generate mix-minuses automatically. Dim: 30"W x 20"D x 7"H.

### FEATURES:

- Bright LED dot matrix displays show inputs
- Analog/digital Program and Audition stereo outs
- 2 mono analog outs and 4 generated mix-minus outputs
- 4 mic preamps, 8 stereo analog & 8 stereo digital ins
- 14 input faders plus two caller faders
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- ESE-compatible clock and programmable timer

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### Accessories:

- D16FSD Dual fail safe power supply List \$1,683.00  
D16CPSD Sliding copy stand List \$383.00

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# BSW Brings You The Coolest Stuff

## Winners of the Radio World Cool Stuff Awards



## Henry Engineering USB Match Plus

For use with your computer, the new USB Matchbox Plus gives you pristine audiophile performance without the noise, hum and interface problems that you can get with built-in sound cards. It provides XLR input and output, as well as an RCA Aux input and converts them to a digital signal to send via USB to your computer, or vice versa. It also adds level meters and a headphone monitor amp/jack so you can quickly evaluate your audio quality.

USBMATCHPLUS List \$695.00

**LowestPrice** only \$659!

## HHB FlashMic - Portable Flash Recording Microphone

The world's first professional digital recording microphone! Perfect for all voice recording applications, especially broadcast and press interviews, the FlashMic combines a high-quality Sennheiser omni-directional condenser capsule with 1GB of flash recording memory to create a durable device that's a cinch to use. Stores up to 18 hours of audio. Transfer via USB port.

DRM85 List \$1,399.00

**LowestPrice** only \$1,299!



## Orban Optimod 9400 AM Processor

The new Orban Optimod-AM Model 9400 combines processors for both AM Analog and AM HD into one inexpensive 2 RU box. The AM analog section is stereo and can be used to replace the 9100B (the 9400 fully protects CQUAM transmissions). Both the AM analog and HD processors can be set up independently - the only common processing elements are the AGC and stereo enhancement. The 9400 uses Orban's new PC remote control GUI and features a built-in Ethernet connection, and multiple I/Os. Call BSW for the lowest price today!

9400 List \$7,990.00

**LowestPrice@bswusa.com**  
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# HD Radio News

Radio World

Covering Radio's Digital Transition

June 7, 2006

## Can AM Analog and Digital Co-Exist?

Calculating Actual (True) Digital Power  
In the AM Hybrid IBOC System

by Steve Davis

The author is senior vice president of engineering, Clear Channel Radio.

With recent industry discussion regarding the true Root Mean Square, or the average power, as opposed to instantaneous "peak" power in the digital sidebands for the Ibiqity AM IBOC system, I decided I needed to conduct some research. It has taken me a while to do this because I needed to consult with some experts and run some tests to verify our findings.

To me this is basically an academic exercise, albeit a valuable one: the AM IBOC system will work, or not, regardless of our calculations or discoveries here.

### Total true RMS digital power

Calculating the "total true RMS digital power" in the AM sidebands using the Ibiqity IBOC digital transmission scheme is more complex than it first appears due to the presence of the multiple OFDM carriers within the

measured passband.

Typically we work with a single carrier, or compare a single signal to another single signal and express that as a ratio in dB. A spectrum analyzer will conveniently display the relationship between signals in dB, making this a fairly simple matter.

However for the purposes of calculating the total true RMS digital power, given the multiple individual OFDM carriers involved, it is necessary to calculate the aggregate power of the multiple carriers, integrated across their full passband. This is *not* the power you will observe directly on a spectrum analyzer display when setting up the system, or measure directly in the field with a field intensity meter, which is a voltage device, not a power meter.

### Ibiqity digital power level specs

The National Radio Systems Committee and Ibiqity standards give the maximum AM digital sideband power as 27.8 dB below unmodulated carrier (dBc). When we set up our AM HD transmitters we adjust the digital sidebands so that they fall at least 27.8 dB below the carrier as measured on a spectrum analyzer with 300 Hz resolution bandwidth, as per the Ibiqity spec.

This is the figure we have been concerned with in the "real world" when deploying these systems, since this is the spec we need to meet. Clear Channel always certifies that with a spectrum analyzer each time we launch an AM IBOC system.

We have purchased quite a few spectrum analyzers

Based on the Ibiqity Hybrid AM specification, the theoretical digital carriers power can be calculated as:

$$\text{Bandwidth\_Correction\_Factor} = 10 \log \left( \frac{4360.5 \text{ Hz}}{300 \text{ Hz}} \right) = +11.6 \text{ dB}$$

Where the Bandwidth Correction Factor compensates for the difference in the measurement bandwidth used for spectrum analysis versus the total bandwidth occupied by either the upper or lower digital sidebands.

Therefore the total digital sideband power for both groups of digital sidebands is:

$$P_{\text{Digital Total}} = \text{Bandwidth\_Correction\_Factor} - 27.8 \text{ dB (per\_sideband)} + 3 \text{ dB (both\_sidebands)} = -13.2 \text{ dB}$$

For 50kW of un-modulated, carrier power, each digital sideband power will be approximately -16.2dBc or equivalent to 1199 Watts.

As a cross check, an RF output power measurement was made using a true RMS power meter (waveform independent) to measure a sample of the transmitter output power while switching the digital carriers ON and OFF.

- > Digital carriers turned off: Un-modulated carrier power only = 384.8mW (Relative power reference)
- > Digital carriers turned on: Carrier power + digital carriers' power = 403.5mW
- > Therefore, the measured, RMS, total digital carrier power only of both sideband groups, is equal to 13.2dB below the un-modulated carrier power.
- > Upper or lower sideband group is 16.2 dB below the unmodulated carrier power.

$$P_{\text{Digital Total}} = \frac{403.5 \text{ mW} - 384.8 \text{ mW}}{384.8 \text{ mW}} = +4.8\% \text{ or } -13.2 \text{ dBc}$$

Analysis of the digital sideband power levels for the Ibiqity Hybrid AM system



The measured spectrum of a typical hybrid IBOC AM operation — in this case, Clear Channel Radio's WGRB(AM), Chicago. The white line is the Ibiqity/NRSC spectrum mask, while the yellow is the actual RF spectrum plot for that station.

for the purpose of setting up AM and FM digital systems. They are also helpful of course for verifying occupied bandwidth and looking at spurious emissions.

### Bandwidth correction factor

But in the case of total true digital RMS power, these numbers, and the spectrum analyzer display, don't tell the whole story. To compensate for the difference in the 300 Hz measurement bandwidth used for spectrum analysis vs. the total bandwidth occupied by all the digital carriers in the sidebands, a so-called "Bandwidth Correction Factor" must be employed to integrate the power across the band of interest.

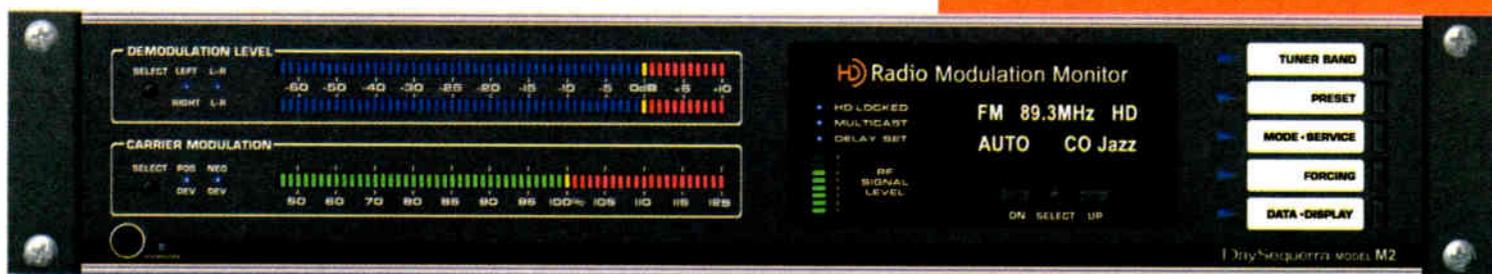
The Bandwidth Correction Factor (BWC) can be expressed as  $10 \log (4360.5 \text{ Hz} / 300 \text{ Hz})$ , or +11.6 dB. This represents integration of the power of the static, individual OFDM digital carriers across 4360.5 Hz.

So we add the BWC of 11.6 dB to the measured

See AM, page 24 ►

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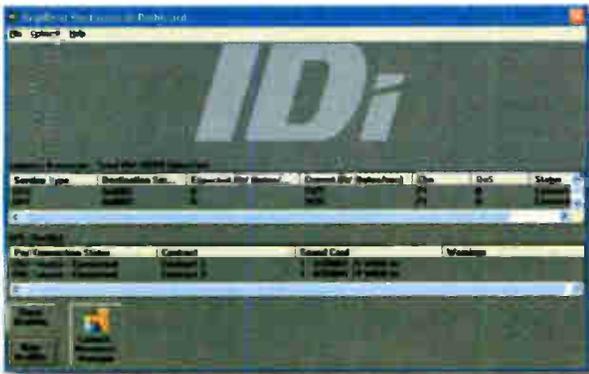


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## Radio World's HD Radio™ Scoreboard

The HD Radio Scoreboard is compiled by Radio World using information supplied by iBiquity Digital Corp. and other sources. The data shown reflect best information as of May 3. This page is sponsored by Broadcast Electronics. HD Radio is a trademark of iBiquity Digital Corp.

### MULTICASTING IN CHICAGO

HD-2 formats on the air or coming soon, according to the HD Digital Radio Alliance or iBiquity:

Station	Freq.	Licensee	Primary Format	HD-2 Format
WPWX	92.3	Crawford	Urban	Gospel
WXRT	93.1	CBS	Triple A	XRT New Music
WLIT	93.9	Clear Channel	AC	Disco
WNUA	95.5	Clear Channel	Smooth Jazz	Traditional Jazz
WBBM	96.3	CBS	Rhythmic Hits	Dance
WDRV	97.1	Bonneville	Classic Hits	Deep Tracks
WLUP	97.9	Emmis	Classic Rock	Loop Loud
WUSN	99.5	CBS	Country	Future Country
WILV	100.3	Bonneville	AC	Love Songs
WKQX	101.1	Emmis	Alternative	Punk Young Alternative
WTMX	101.9	Bonneville	Hot AC	All '80s
WVAZ	102.7	Clear Channel	Urban AC	Gospel
WKSC	103.5	Clear Channel	CHR	Kiss Dos
WJMK	104.3	CBS	Adult Hits	Oldies 60s/70s
WCKG	105.9	CBS	Talk	News
WGCI	107.5	Clear Channel	Hip Hop/R&B	Old School Hip Hop

#### The HD Radio Bottom Line



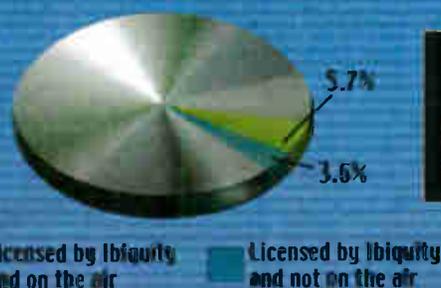
#### Last Month



#### Market Penetration United States

13,660 AM & FM Stations  
(excludes LPFMs)

Number of  
FM Stations  
Multicasting:



# AM

► Continued from page 22

(required) digital sideband signal level of -27.8 dBc, which is what we read on our spectrum analyzers, and we get a total sideband power for the upper or lower digital sidebands of -16.2 dBc. Given this fact, the interfering true RMS power/energy of the IBOC digital sideband to a first adjacent station for a 50 kW AM station is 1200 watts or -16.2 dB below the 50 kW unmodulated carrier.

Self-interference to the host analog station is 3 dB worse, since *both* sidebands are present within the host envelope. The total RMS energy in the two digital sidebands combined, is 13.2 dB below the unmodulated carrier within the

host channel envelope, or 2,400 watts for the 50 kW AM example.

## Is Ibiquty wrong?

But Ibiquty and the NRSC mask specs each sideband at 27.8 dB below carrier. Accounting for both digital sidebands, the digital signal is still only spec'd at -24.8 dBc. What's wrong here? Are we all exceeding legal power?

No, because -27.8 dBc is the correct level observed on a spectrum analyzer for each of the primary digital sidebands when setting up the system. It's not the total true RMS power integrated across all the digital carriers, which is what is being discussed here.

It's also worthwhile to note that when we speak of a 50 kW analog station, that too, is not the power integrated across the full audio passband when modulated with

a complex waveform. Additionally, with 100 percent modulation, the analog power will actually be 75 kW, which is 150 percent of unmodulated power, but the digital power never changes.

## Results

This is a lot of theory, so to confirm these numbers, we collaborated with an equipment vendor to conduct a test. Using a waveform independent, true-RMS power meter, we measured total power in a properly adjusted IBOC AM transmitter with an unmodulated carrier and all digital carriers turned *off*, and again with all digital carriers turned *on*.

The tests confirmed the math above: RMS power on either sideband was 16.2 dB below unmodulated carrier, and RMS power within the full band was 13.2 dB below unmodulated carrier. We repeated

the exercise using a calorimeter, which is truly bandwidth agnostic, and observed the same results.

So I'm fairly confident that -13.2 dBc for on band digital to analog, and -16.2 dBc for first-adjacent digital to analog, are the right numbers for true RMS power of the digital carriers in a properly adjusted AM IBOC system. Just remember these figures refer to an unmodulated carrier for the Hybrid mode, with analog and digital co-existing on channel.

How is this supposed to work?

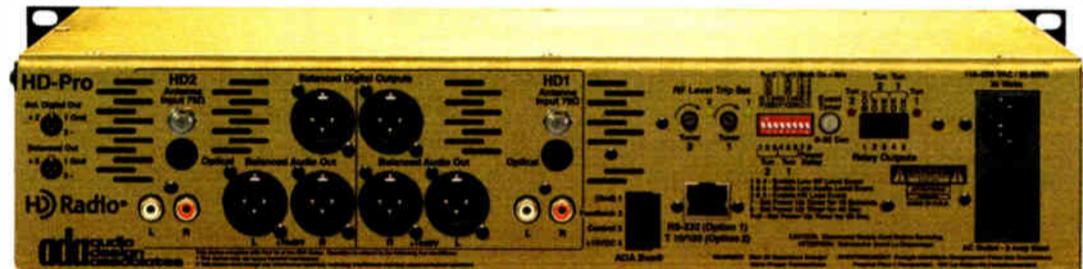
Broadcast engineers, scientists and PEs with CBS, Westinghouse, Gannett and others designed the AM IBOC system now in use with a goal of permitting digital transmission within the AM band while minimizing interference to existing analog operations. To accomplish this, each of the digital carriers within the AM IBOC signal is orthogonal to 90 degrees out of phase with its adjacent carrier, and the upper and lower sidebands are complex conjugates of one another.

The creators implemented it this way to cause the energy in the digital carriers to be nulled out in a typical AM receiver or envelope detector. The theory is similar to the way an out-of-phase power vec-

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tor is used to null out/reduce the signal in an AM pattern null in AM directional antenna theory.

Will AM analog and digital co-exist?

None of this guarantees that AM IBOC signals won't create interference to other AM analog stations in the field, nor does it guarantee that they will. While the system authorized by the FCC today has been extensively tested and verified by the system designers and the NRSC, I'll be the first to admit that those were for the most part laboratory conditions, except for some field tests.

As they say, "The proof of the pudding is in the eating." More than 750 total stations, both AM and FM, have been converted to digital as of late April. For reasons such as array and amplifier nonlinearities, pattern bandwidth, poorly adjusted or maintained arrays or phasing/branching networks, and impedance asymmetry, it is certain that there *will* be cases of interference, something we as engineers will be asked to correct.

The transmission system designers and receiver manufacturers will also continue to work to improve the system. As the owner of more AM radio stations, in markets large and small, than any other broadcaster, you can rest assured that Clear Channel is very concerned about the potential for interference in the AM band.

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# Pubcasters Delve Into Tech Issues

Digital Coverage, Extended Hybrid Carriers Garner Interest at NPR PREC

by Leslie Stimson

**LAS VEGAS** Six years ago, the first NPR Radio Engineering Conference focused on early designs for the "next-generation" Satellite Operating Support System and "kicking the tires of the proposed IBOC system." Now, implementation of both initiatives is taking place, as stations digitize their air chains and NPR Distribution's Public Radio Satellite System rolls out ContentDepot.

Here are highlights from this year's PREC, with more on ContentDepot and accessible radio coming in our next issue.

## EXTENDED HYBRID CARRIERS PIQUE INTEREST

Using the extended hybrid carriers for IBOC — or what Ibiqity Digital calls "MP3 mode" — is of interest to some pubcasters.

Mike Starling, vice president and chief technical officer for NPR and the executive director of NPR Labs, said WAMU (FM) in Washington has tested a third

supplemental channel on-air, a BBC voice channel at 24 kilobits per second. He said at least a couple of other stations have received experimental authorization from the FCC to turn on the extra carriers. Current HD Radios can receive the extended hybrid mode, he said.

The director of engineering and information technology for WFAE(FM) in Charlotte, N.C., Jobie Sprinkle, said his station plans to experiment with the extended hybrid mode.

## IT'S THAT DARN 'RF TRASH'

More than 30 public radio stations have gathered field test data on their FM IBOC coverage.

Senior Technologist John Kean said NPR Labs put the measurements into a statistical model for field strength and concluded, "For most stations, 97 percent coverage requires a 73 dBu field strength; 90 percent coverage requires 65 dBu." While the availabilities of 97 percent and 90 percent were picked as convenient benchmarks and have no special signifi-

cance, said Kean, for the first time, FM broadcasters have a set of values to describe the practical coverage of HD Radio; this is based on a combination of field strength (in dBuV) and statistical availability of reception (in percent). Kean will write here in more detail on this topic in a future article.

Engineers at the 30 stations drove around their coverage areas measuring IBOC coverage. Field measurement differences were caused by several factors, such as terrain and environmental noise. Auto noise sources such as the ignition, on-board computer and "little things that go into the cigarette lighters ... can produce real RF trash," said Kean.

Discussing indoor reception, he held up an FM dipole antenna, one like the one now included by Boston Acoustics with its tabletop Receiver HD. Studies by NPR Labs found the shorter "rat tail" FM antenna "may get the job done for analog," but not in all cases for digital, said Kean, as reported here earlier.

He urged stations to share their experiences with indoor coverage for HD Radios.



NPR Labs John Kean holds up an FM dipole antenna.

ing a premium pledge amount for which the listener would earn an HD Radio, perhaps at \$1,000 or more.

## U.S. HAS BIG CHUNK OF RECEIVER SALES

The HD Radio rollout is approaching 10 percent of U.S. radio licensees, said Joe D'Angelo, vice president, Advanced Services, Ibiqity. Overall some 3,800 U.S. radio stations, or roughly 30 percent, have expressed a commitment to the

Comments from the last pledge drive included, 'Since you've added HD2, I feel compelled to pledge.'

— Tom Dollenmayer, WUSF(FM)

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NPR Labs is investigating methods to supplement digital coverage, including digital signal boosters and single frequency networks to fill coverage holes, he said.

## 'COMPELLED TO PLEDGE'

NPR employees working on multicast receiver issues are hoping to finalize a program to help stations buy HD Radios at reduced prices, in return for marketing of the radios.

Starling said the group is focused on a program, still in draft stage, that would give NPR member stations some sort of credit or "bounty" for every receiver sold.

NPR had tried to get such a program going a year ago but lack of HD Radios hampered the effort, as RW has reported.

The network helped stations make a group buy of the BA Receivers in November worth approximately a quarter of a million dollars, Starling said.

Meanwhile, since classical- and jazz-formatted WUSF(FM) in Tampa, Fla. started cross-promoting its HD2 channel, "We've been getting phone calls if we drop in mentions of the talk programs," said Tom Dollenmayer, the station manager. Station Web sites promoting HD Radio are getting hits, as well, he said. "People are asking the station about (receiver) brands and availability." The station sent HD Radios to board members and community leaders and is doing a trade with a local car dealer with a Kenwood HD-R in the car as a demo vehicle.

One comment from the last pledge drive was, "Since you've added HD2, I feel compelled to pledge," he said.

The station is thinking about establish-

rollout, according to Ibiqity.

Ibiqity has about 92 percent of the receiver market licensed for HD Radios, he said "It has taken some time, but ... plants in China that produce (radios) are now ready to turn out tens of thousands of receivers a month."

About 40 percent of receivers sold in the world are sold in this country, he said.

OEM brands of receivers are committed to install HD Radios on 45 vehicle platforms. GM, Ford and Volvo were said to be among them, sources told RW.

## 'EASY HD-R', DICE INTEGRATOR COMING

Two products Ibiqity in which is especially interested would allow current in-dash radios to decode IBOC signals.

One product in development, which Ibiqity calls "Easy HD Radio," would allow a satellite radio to be "daisy-chained" to add HD-R. "We're not going to force people to choose between us and satellite. If you have satellite, you can add us, too," said Ibiqity's D'Angelo.

Dice Electronics plans to release an integration kit for an OEM car radio system in the third quarter of this year. It works through the CD changer bus to convert most in-dash radios to HD-R, as reported previously.

There were some nine new HD-R receiver products shown at CES this year; next year by NAB he predicts that number will surpass 65.

"All of it will be multicast-capable," according to D'Angelo.

Ibiqity is working on a single-chip tuner that could reduce power consumption by about 60 percent.

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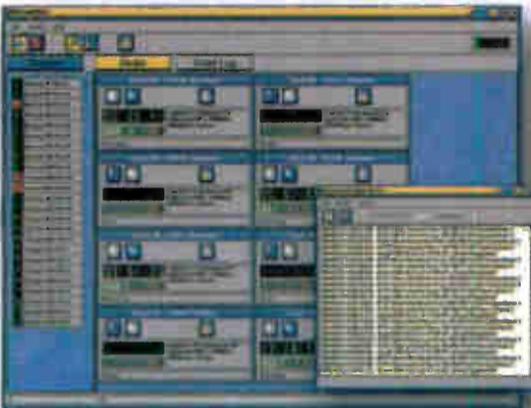
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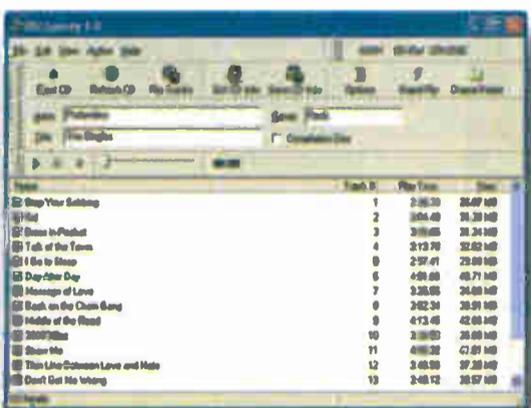
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# HD2 Channels Top Spring Show

*More Receivers Soon, Supporters Say, With 'Nine Automakers, 38 Models by 2008'*

by Leslie Stimson

Multicasting is now the darling of HD Radio supporters, and much of the IBOC news at the spring NAB convention was about efforts of broadcasters in the HD Digital Radio Alliance to further the rollout — in part, using their additional channels.

At conventions past, industry observers asked when IBOC would arrive. Now it's here, and we're asking when more receivers will be available. The short answer: this summer.

Here are highlights of HD Radio news at NAB2006, with more about HD-R surround and data demos next issue.

## STRUBLE: ALLIANCE HAVING TREMENDOUS EFFECT

"It's all coming." So says Ibiquity Digital President/CEO Robert Struble.

The efforts of the HD Digital Radio Alliance are having a tremendous effect on the digital radio rollout, the head of the technology developer believes. In an interview with Radio World, Struble pointed to recent news of additional HD2 channels coming on alliance stations and the launch or expansion of HD Radio offerings by Tweeter and Crutchfield.

"The alliance has fundamentally changed the speed at which all the players on the consumer side are acting — manufacturers, chipmakers, car guys and retailers," said Struble. Alliance efforts "are having a major effect. We've never been as busy on the consumer side as we are now."

But he sought to remind the industry that speed is relative. Focusing on the new receiver reference design that Ibiquity released to manufacturers recently to speed production of receivers, Struble said: "If we're talking radio, where we can change a format overnight or sell an ad and have it on the air that

afternoon, 'faster' is like in a couple to three hours. In consumer electronics, 'faster' might mean taking 18 months down to nine or 12 months."

RW published a story in the May 10 issue by an engineer in San Jose, Calif., who visited electronics stores and had a tough time finding an HD Radio connected to an antenna so that it could be demonstrated.

Struble said, "That's going to take some time. Demonstrability is an important issue. We're working on it." The CE industry presents obstacles, he said, including frequent turnover in sales personnel at big "box stores," where most people buy their electronics.

## HD RADIOS IN DOMESTIC CARS?

Speaking of slow, when can the U.S. radio industry expect to see HD Radios in domestic cars?

Ibiquity representatives repeated a mantra of "nine automakers, 38 models by 2008" in several sessions.

"There's a lot in the pipeline," Struble said. However, "No one wants to announce in advance of those radios being in their cars for competitive reasons. But we're feeling quite good about what's going on."

## PRIORITIES: RADIOS, PORTABLES, GLOBAL

Helping its partners sell more HD Radios in the United States remains an overriding priority for Ibiquity, Struble said, and the company is working with the alliance, receiver manufacturers, retailers and broadcasters to make that happen.

Looking beyond that, long-term goals for Ibiquity focus on portables and international markets.

"Portable" HD Radios, Struble says,



Beasley morning show host and Program Director Mike O'Brian, right, of KSTJ(FM) in Las Vegas, shows off the company's HD-R demo van to NAB Radio Executive Vice President John David, center, and other attendees.

doesn't just mean Walkmans, but also MP3 players, PDAs and cell phones.

"Getting the HD Radio technology to a state where it can function in those types of devices is a high priority, and we're making progress on that," he said. Manufacturers could work on incorporating IBOC on such devices next year.

HD Radio is on the air in various forms in Brazil, the Philippines and Thailand. Ibiquity RF manufacturing partners are testing HD Radio in several countries, including Switzerland, France and Poland; Canada and Mexico are assessing it. Struble said international testing "is a direct function of the success the technology is enjoying here in the States. That serves as an important filter for other markets." Ibiquity also has been beefing up its international team.

## INTERFERENCE CONCERNS TO BE STUDIED BY CPB

Not many people at the NAB show were talking about problems with IBOC, but the rollout has taken place against a backdrop of anecdotal complaints about reduced coverage in some cases and others about interference to the host analog station or to neighboring channels.

Struble and other Ibiquity employees said the company is working through those instances on a case-by-case basis.

"If a station were to have issues, we've got folks set up to help," said Struble, but he added that equipment manufacturers would be the likely ones to hear those complaints now that the technology has matured. Manufacturers contacted by Radio World said they've not had complaints.

Public radio, meanwhile, is seeking to quantify HD-R interference. The Corporation for Public Broadcasting plans a study to determine the extent of coverage problems and the loss of analog and digital coverage due to interference. Its long-term goal is to determine how such coverage loss might affect pubcasters audience long-term.

"CPB is concerned with the disenfranchisement of listeners due to the loss of services public radio currently provides

to them and the underperformance or lack of HD service (i.e., technical availability) when the conversion of public radio stations to HD is complete," it said in the announcement.

Listener loss is crucial because after years of growth, the audience for public radio is now static, experts agree; the medium is subject to the same siphoning of listenership experienced by commercial radio from the Internet, iPods, MP3s, and other new personal technologies for content delivery.

CPB seeks applicants for a study of at least 75 markets; it thinks the study will take about a year. See [www.cpb.org/grants/radiointerferenceanalysis/](http://www.cpb.org/grants/radiointerferenceanalysis/)

## WE DON'T NEED NO STINKIN' BOOTH

At least 20 companies displayed HD Radio-related equipment on the show floor, many with live broadcasts from Las Vegas HD Radio stations. It was for that reason, said Struble, that the technology developer didn't have its own booth at the show.

One listserv rumor held that the company is facing an impending financial crisis and pointed to the lack of an Ibiquity booth as a symptom. Struble termed the rumor "ridiculous."

"The issue is not the booth. It's the 15 to 20 engineers I've got to send here to get the booth up and operating, including the demos," said Struble. He said most of Ibiquity's partners were clear on where its priorities should be — helping to get more HD Radio receivers in the marketplace.

He said the \$100,000 or so the company has spent on NAB booths each year was a reasonable expense, "not a major budget item for us."

## MORE HD2 CHANNELS HERE

In the next few months, member stations of the HD Digital Radio Alliance are rolling out HD2 channels in an additional 22 markets.

The group announced not just the markets, but the coordinated formats in each, the second wave of formats to be announced. The first 25 markets were unveiled earlier this year. HD2 multicasts will be available in 50 markets, including 42 of the top 50. Officials said this step came more than six months earlier than they originally thought it would.

The number of new radio channels announced under the initiative now tops 450, of which 227 were on the air as of early May, according to RW's HD Radio Scoreboard, page 23.

Alliance members select the formats in an organized process for each market. The supplemental channels initially are commercial-free.

Alliance members have created more formats to add to the HD2 lineup, with names like Eclectic Chill-Out, Christian Contemporary, Café Jazz & Blues, Mash-Up and Outlaw Country.

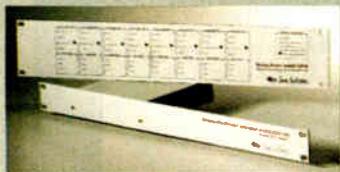
"One of the most exciting things about HD Radio is the ability to offer innovative new content customized for each individual local market," said Peter Ferrara, president and CEO of the alliance. "Unlike any other audio entertainment source, radio is all about serving the local community and these new HD2 channels will do just that."

The rollouts are in markets ranging from number 15 to 40, including See SHOW HD-R, page 30 ►

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Making Digital Radio Work.  
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## Show HD-R

► Continued from page 28

Phoenix, Minneapolis, San Diego, Nassau-Suffolk, N.Y., St. Louis and Tampa, Fla.

Broadcast groups formed the alliance late last year to accelerate the digital radio rollout. Members include major groups and independent station owners: ABC Radio stations in Los Angeles and Minneapolis, Beasley Broadcast Group, Bonneville International, CBS Radio, Citadel Broadcasting, Clear Channel Radio, Cumulus, Emmis Communications, Entercom, Greater Media, Susquehanna and WBEB(FM) Philadelphia.

### RADIOSOPHY TO SHIP IN SUMMER ...

Radiosophy says it has worked through the receiver sensitivity issues on its MultiStream HD tabletop IBOC Radio.

"We're confident we've met, and exceeded, Ibiquity's guidelines for sensitivity on AM and FM receivers and will go into production soon," said Tim Tushla, sales and marketing representative for the receiver maker. The unit will list for \$269.

The company expects to begin shipping back-orders in early July. "We've got the parts on-hand, we've done the tooling for the speakers, the plastics.

We're ready to get the internal electronics done, get them mass-produced and into production," he said.

Radiosophy demoed its radio in the Broadcast Electronics booth, with the main FM signal at 48 kilobits per second, the first supplemental channel at 32 kbps and the second supplemental at 24 kbps. Since the fall NAB Radio Show, the company has added a light that glows when the unit acquires the HD-R signal.

The company also added a USB port to enable later download changes to the firmware, said Tushla. The company also can pre-set a station's frequency into the unit so when the box arrives, the radio would be pre-tuned to that particular station. This feature is intended to make the model attractive to stations as a promotional item.

The company is seeking a new chief technology officer, Tushla also confirmed. Former Gateway engineer Bruce Young, hired for the CTO job last August, recently left the firm.

Radiosophy founder and former CTO Bill Billings is again filling the CTO role; he is the company's vice president of technology and represents the company before the NRSC.

### ... AS WILL POLK HD-R UNIT

Another tabletop HD Radio unit is due on store shelves soon.

Polk Audio says it has resolved its remaining engineering issues and is going into production for its I-Sonic

entertainment system, a stereo system that includes an AM/FM, HD Radio tuner, a DVD/CD player and XM Satellite Radio capability.

The unit includes auxiliary inputs for external iPod, MP3 and other personal portable players.

Audio Marketing Manager Paul DiComo told Radio World the company estimates that I-Sonics will be on store shelves and available for sale on the company Web site by Aug. 1. The unit will list for \$599.

### CLEAR CHANNEL MULTICASTS TO REACH 196

Individual members of the HD Digital Radio Alliance are publicizing their additional HD2 formats.

Clear Channel planned to add multicasts in 20 markets, for a total of 196 Clear Channel stations in 48 markets with digital multicasts. Cities include Phoenix, Minneapolis, San Diego, Denver, Pittsburgh, Orlando and Las Vegas.

"In some cases, local programmers will draw from programming created by the Format Lab within the company's Content Research & Development Group," it stated. "In other cases, the channels are programmed fully locally, as is the case with New York station Z100."

Clear Channel is mixing up various flavors of country, AC, Spanish and urban formats; additionally, three markets are getting AAA format HD2 channels. Comedy, All-Acoustic and Disco are some of the less familiar formats.

Clear Channel has approximately 210 stations transmitting HD Radio signals.

### COX ADDS HD2 STATIONS

Cox Radio announced the launch of seven HD2 formats in the Atlanta and Tampa markets.

Those "HD2 sub-channels represent the company's initial digital-tier radio programming feeds and will serve as test markets for its HD2 initiative," said the company.

Cox Radio President/CEO Robert Neil said the company would "aggressively test" the platforms with the goal of further developing the product to best position Cox in the digital marketplace.

In Atlanta, WSB(FM) will air Soft Standards; WBTS(FM) will go with Pop Top 40; WALR(FM), has chosen Adult Hip Hop and WSRV(FM) will simulcast Cox Radio's AM750 News/Talk format.

In Tampa, WSUN(FM), will broadcast All Grunge Rock; WPOI(FM), is going with a Modern Adult format; and WWRM(FM), will air Contemporary Christian programming.

### EMMIS EXPANDS HD2 TO PHOENIX, ST. LOUIS

Emmis Communications unveiled its next wave of supplemental digital channels in Phoenix and St. Louis. It will roll out these multicast channels in coming months.

In Phoenix, KKFR(FM) will broadcast Power Dos, produced by sister station KPWR(FM) in Los Angeles. Power Dos is a bilingual and musically extended version of Power 106 and should launch in Phoenix in August.

In St. Louis, KFTK(FM) will air Fox News, KIHT(FM) will broadcast Classic Hit Spice, KPNT(FM) will air Current

Alternative and KSHE(FM) HD2 listeners will hear Country Variety.

All HD channels for Emmis' St. Louis stations will be up by September. In January, Emmis announced formats for its supplemental HD channels in New York, Los Angeles, Chicago and Indianapolis.

### GREATER MEDIA SPECIFIES N.J. PLANS

Greater Media publicized specifics of its HD2 plans in New Jersey. WDHA(FM) will air a rock format of live performances called WDHA Live. WMGQ(FM) will go with a triple A format called Over Easy.

The company said HD2 formats for its other New Jersey-based stations would follow soon. The company has multicasts on the air in Boston, Detroit and Philadelphia.

### KSTJ HD-R DEMO VAN ROCKS LVCC

KSTJ(FM)'s mobile HD-R party van rolled up to the Las Vegas Convention Center and parked in the Silver Lot so attendees could get inside.

Beasley Broadcast Group promoted the supplemental services on the Las Vegas station.

Using the slogan Star Party 102.7-HD2, the station was Beasley's first supplemental channel in the city. It airs an all-music channel that features an upbeat club mix of dance and urban '80s music.

The mobile van, outfitted with a HD receiver and sound system, provided visitors a chance to hear HD Radio. KSTJ was multicasting three HD Radio channels — the main and two additional — at the convention. Star broadcast real-time weather information on HD3. Both Star 102.7 KSTJ(FM) and the format on HD2 are synchronized with data streams containing program-associated data.

### HARRIS-CUMULUS SIGN 'MULTIMILLION' HD-R DEAL

The country's second-largest radio group by station count will convert at least 80 percent of its stations to HD Radio by 2012 using Harris transmission platforms. The agreement signed by the companies is a multimillion-dollar deal, they said.

Cumulus Broadcasting has 345 stations now that it has closed on its acquisition of Susquehanna Radio (see page 2), making it the fourth-largest U.S. radio owner when measured by annual revenue, according to the company.

Harris will provide HD transmitters and Flexstar HD products. It will also provide analog transmitters to Cumulus stations.

Each site will feature an HD Radio-ready Harris transmitter with the new DSP-based Flexstar HDX-FM exciter. Cumulus will install Flexstar HDI-100 Importers and HDE-100 Exporters implement supplementary audio for multicasting. The integration of the Flexstar units will allow Cumulus to integrate the IT-oriented Importer and Exporter at the studios instead of transmission sites.

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# Studio Sessions

Product Guide



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Radio World

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June 7, 2006

## Lufthansa Jet Becomes Mile-High Studio

*Comrex's Access Codec, 'Connexion By Boeing' Serve as Wingmen as Show Airs From the Sky*

by Charles Dubé

On April 22, an unusual radio first was accomplished. Peter Greenberg, host of the syndicated "Travel Today," broadcast his entire talk radio show from a moving commercial aircraft, utilizing a combination of Internet and broadcast technology.

Greenberg is a travel journalist and editor for NBC's "Today" Show, chief correspondent for the Travel Channel, travel author and host of "Travel Today," a show originating from wherever in the world he happens to end up. In the process, he logs about 400,000 miles a year.

For Greenberg, the phrase "air miles" now has a new meaning.

### Sky-high Access

Greenberg said in the show's opening: "Every week when I say 'welcome aboard,' we're at a different location on the ground. Today, 'welcome aboard' means something else, and if you haven't guessed it already, we're talking to you from about 37,000 feet in the air."

Although codecs and the Internet have been employed in the broadcast environment for some time, their successful marriage allows for non-terrestrial broadcasting with a reliability and audio quality hitherto unprecedented.

As ISDN resources become harder to find, and the older traditional methods of remote broadcasting all but extinct, broadcasters have once again had to become creative in methods of transporting high-quality — and, ideally, minimally latent — audio from point-to-point.

With the widening of the long-distance telecommunications infrastructure in the 1980s and '90s, the world shrank. But as the availability of various telecom products

followed paths created by market demand, the various methods of shipping audio around the globe changed, as such services like Switched 56 morphed into ISDN.

Now the IT world is jumping ship to means that are less expensive and more

flexible. This has left broadcasters and video conferencing alone as the primary ISDN patrons. Major telecommunications providers are left to rethink their support of ISDN, and broadcasters are starting to look elsewhere for their remote broadcasting connectivity.

In March 2005, engineers from Comrex began field-testing a new technology they labeled BRIC, which stands

for Broadcast Reliant Internet Codec. As we have all experienced, the Internet can be a precarious terrain for the demands of broadcast audio, with its intolerance to interruption and self-centered requirement of audio quality. Unlike other data-transmission consumers, the broadcast world doesn't take too kindly to frequently retransmitted packets and network congestion.

What was needed was a means of expanding the reliability of the Internet as a ubiquitously accessible vehicle, being flexible and friendly to entrance ramps that are DSL, Wi-Fi, cable modems and even high-speed cellular. Comrex said its testing of BRIC proved that, with a careful balancing of buffering suited to the characteristics of a given network, it could be done.



Mike Worrall and the Comrex Access (under laptop)

BRIC was soon incorporated into the manufacturer's appropriately named Access, a codec designed to work in digital and POTS neighborhoods.

According to the company, the Access operates on several levels depending on the job and the digital resources available from the network. BRIC HQ-1 results in a 15 kHz audio bandwidth, operating at 28 kbps, and allows for mono or stereo transmission. A dual-mono capability is featured and the inherent delay is kept to a minimum. BRIC HQ-2 is the next level, featuring a 12-15 kHz frequency response resulting from a 24 kbps bitstream.

If ramped up to 24-30 kbps, stereo is achievable with a delay comparable to ISDN. Scaling the frequency response down to 12 kHz lessens artifacts and is allowable. A "speech-friendly" setting of BRIC HQ-3 provides quality voice transmission at challengingly low bit rates (i.e., 10 kbps). The result is similar to G.722 in sound, but utilizes one-sixth the amount of data. Hence, stability is enhanced without a submersion into the swimming pool of artifacts. An MPEG-4 AAC algorithm is available as an option to this mode.

Finally, Access is backward-compatible to previous POTS codecs. About the size of a paperback book, the Access connects to the Internet via Ethernet port, 3G Cellular, Wi-Fi or Wi-Max card, or modem. Its battery pack provides about seven hours of broadcast time per charge.

The Comrex Access was employed for this flight, the world's first full-length broadcast from a moving trans-Atlantic flight. Using "Connexion by Boeing" high-speed in-air internet service — which, using an aircraft to satellite link, allows any Windows 95 + or Apple OS-9/OS-X laptop with a Wi-Fi card to connect to the internet — Peter Greenberg broadcast while en-route from Frankfurt to New York.

See MILE-HIGH, page 34 ▶

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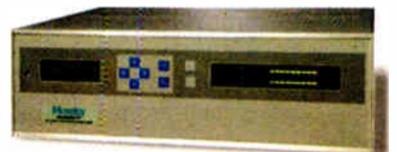
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# Mile-High

► Continued from page 32

Engineer Mike Worrall performed his first test of the BRIC package while on a Lufthansa flight to Germany on Friday, April 14, and reported that it was "completely successful." During the 20-minute glitch-free test, Worrall observed a 1.25 second delay in the recovered audio, which he felt was quite "workable," considering delays inherent in the buffering, network congestion and coding.

Comrex's BRIQ HQ-1 setting provided an audio bandwidth of 15 kHz of duplex mono.

But as Worrall explains, the technology worked perfectly; the human element did not.

"Though we had coordinated our 'test flight' with both the Lufthansa Public Relations and Engineering departments, somehow the Los Angeles ground crew failed to get word to the pilot and purser that Lars [Hansen from Boeing] and I would be on board," said Worrall. "We were about 20 minutes into our test, when apparently one or two other passengers inquired of the stewardesses what we were up to, wearing 'sports' headsets and talking animatedly to an obvious third party. A few minutes later the captain appeared, clearly upset — and understandably so — about what must have appeared to be a clandestine communications system.

"He forcefully 'asked' us to turn our equipment off — immediately — and of course we complied. So, while we were able to make a brief connection, our 'test flight' was far from the conclusive test we had hoped for," he said.

## Line-of-sight at 37,000 feet

On April 22, Greenberg took the show into the air aboard an Airbus A330 Lufthansa flight from Germany to New York. The two-hour broadcast, could be heard on radio, podcast and — appropriately enough — the Internet. It went



Peter Greenberg interviews Capt. Raimund Müller, chief pilot, vice president, Airbus Long Range Fleet.

flawlessly, said Worrall, an effort involving engineers at Boeing Connexion, Lufthansa and Comrex.

As Lars Hansen from Boeing explained near the beginning of the show, the link was provided by connecting Greenberg's Comrex Access equipment to a server aboard the aircraft, in the same fashion that any traveler may now gain Internet access via their laptop when using Boeing's Connexion service.

The data was transmitted from the aircraft to satellite, where it was downlinked at the Connexion site in Littleton, Colo., to be interfaced with the Internet. The IP connection to KABC — home studio of "Travel Today" in Los Angeles — then sent the audio to New York via linear TI for network distribution. Callers participating on the show on mix-minus were linked from New York via ISDN to KABC, back to Littleton as packets, up into space and back to the aircraft. The KABC midpoint served as a backup in case of trouble in New York.

This cross-connection of terrestrial and Earth-bound bit streams became

particularly interesting when at one point in the show a friend of Greenberg's called in from yet another Lufthansa aircraft in flight utilizing a similar satellite/data connection.

To the user, logging into Boeing's Connexion is the same as logging into a WiFi or Ethernet connection, such as those found at a hotel where a "fee-based service" is found (other airlines now offer similar services such as Tenzing and Sky Way Aircraft).

"If you've not experienced this, one simply opens Internet Explorer and is presented with a 'Welcome to This Fee-Based Internet Portal' screen. [You] then provide credit card details and [are then] connected to the Internet," Worrall said.

To get an idea of the cost, with Lufthansa for instance, you can purchase an entire flight's worth of service for about \$30. Airlines offering this service post the rates on their Web sites. An option to pay by minute also is avail-

able. The cost is scaled by usage, so the cost per minute increases as the total amount of time is decreased.

Worrall also notes that for overseas flights between Europe and North America, there is a transition that occurs between the between satellites serving the two continents. This creates a "downtime" of about 90 seconds where the connection is broken. In the meantime, the two Access units continuously call for each other and automatically reconnect. For this particular broadcast, Boeing was able to force the switch about 15 minutes prior to airtime.

The actual connection time, Worrall reports, was "amazingly fast; I'd guess less than a second," he said. Because the Comrex Access didn't "dial out" in the conventional sense, simply connect to the IP address of the Access you wish to "converse" with.

Worrall reports that data latency created only about a 1.5 second delay for most of the transmission, and in listening to the show the audience would have little to clue them in on the complexity of the signal path. There was no awkward hesitation between host and caller, and the flow of the conversation was as natural as a call across the street for pizza. The BRIC HQ-1 algorithm inherently possesses a 60 ms delay. Switching to HQ-2 would have increased this figure to 360 ms, making interviews a little awkward, but would have reduced artifacts if these become noticeable.

Curiously enough, the FCC has not authorized any on-board Internet service on aircraft flying between domestic destinations thus far. One can utilize Connexion By Boeing while over U.S. airspace during an international flight, but only once en-route or returning from an overseas airport. If you are en route to another U.S. city for transfer, you cannot utilize the service.

*Charles Dubé is the chief engineer for WFCR(FM) at the University of Massachusetts in Amherst, Mass.*

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### AEQ Replaces DR-100 Handheld With PAW-120

AEQ's PAW-120 handheld digital field recorder offers microphone cells and optional external stereo microphones, in addition to a speaker and 512 MB of flash memory. The Palm Audio Workstation lets the user record, playback and cut Musicam, BWF and WAV formats, and also can connect to a PC via USB interface to upload or download audio files.

The company says it is suitable for journalism and broadcast applications, as its portability allows the user to view the information on its dual color screen with one hand.

The USB port serves two purposes: file download or external DC powering. Direct audio files download from the PAW-120 to Windows and Mac OS. The 512 MB memory holds roughly nine hours of voice recording at 128 kbps of MPEG I Layer II in mono in FM quality, and about five hours of music recording at 256 kbps of MPEG I Layer II in stereo in FM quality.

The PAW-120 includes an audio editor, and the OLED display eases sound editing for journalists. Additionally, the PAW-120 allows sections of unwanted audio to be removed, and offers a Zoom-In option.

The PAW-120 retails for \$699. It runs on two AA batteries, and comes with a carrying case and accessories for a professional XLR microphone. The PAW-120 replaces the company's DR-100 portable recorder.

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



PRODUCT EVALUATION

# Arrakis Has 10-, 14-Channel X-Mixers

by Greg M. Savoldi

I, along with staff engineers Andy Mika and Brian Longstreth, spent an afternoon with an Arrakis X-Mixer-14 in our Columbus engineering shop. The 14 — a smaller 10-channel version is also available — is packed with an array of hardware and software features. Most notably, this console plays in digital, analog and with or without a PC.

The X-Mixer is the latest of Arrakis' digital consoles, actually the company's third. The Revolution series was introduced in the late 1990s and the Nova-10C — little brother to the X-Mixer — in 2002.

The base console supports 14 audio source inputs: two mic, 10 stereo analog line and two AES3 digital. The option board, standard on the X-Mixer-14, gives the user eight more digital in and two more mic preamp patch points, for a total of two to four mic, eight to 10 analog line and 10 AES inputs. Each input can be assigned to any of the 14 faders or the 12 source selects.

In most applications, S/PDIF sources can interface with the AES inputs of the console by simple transformer matching, or impedance matching by adding a load-impedance resistor.

In our tests, we drove an AES input with a 44.1 kHz AES output from a Denon CD player. Although the console bus operates at an internal sample rate of 48 kHz, the digital inputs' sample rate converters lock everything together. Analog inputs get A/D'd in 24-bit Delta-Sigma with low latency.

Arrakis has done a nice job silkscreening inputs and outputs on the motherboard while still using its AMP MR series receptacles/connectors. Crimping tool and pins are supplied; just add wires. Installation is straightforward.

The console weighs less than 35 pounds, and fits into spaces where other gear won't. When we pulled the console from the shipping box, I thought they forgot to ship the power supply, the rather large "black box" that typically attaches to the cabinetry underside with the interconnect cable. Instead I saw a "line lump," a fully encapsulated power pack; AC plug on one end, DIN plug on the other.

Seeing this made us laugh, realizing how far technology has come and how efficient this console operates. All DC power rails are derived from 'the lump' and it's the easiest supply you'll install.

### On the bus

Without the use of a PC, you can operate in a conventional sense; say a source inbounds on fader 4 and that source stays there. Label the pot appropriately and all is well. With the supplied Windows-based software and a serial connection to the motherboard, you open a whole new world of "soft control."

Take that same source coming in on fader 4, and reassign it to fader 10, 3, 7, or 3 and 4 at the same time. Adjust fader trim (in-hand operator gain), source logic, off-line mix and count-up timer control. You can enable/disable Autocue and Autocue attenuation.

Sources can be 'moved' without touching a wire or connector. If one operator likes their CD players on faders 3 and 4, but another prefers the automation server



elsewhere, it's no problem. You can restore defaults with a mouse click. Once you save those settings, non-volatile RAM retains the setup, even after removing the PC and power cycling the console.

The only issue we had with the board on a power cycle sequence was the fact that "last state" settings of the fader on/off logic are not maintained. All channels resort to "off." A UPS on the console (and you certainly wouldn't need a big one for the line-lump supply) would resolve this issue in most situations, assuming you have an emergency power generator at your location.

The PC option is wonderful, but is not necessary for most station applications. There are two banks of DIP switches on the motherboard to perform basic setup for things like Autocue, tally logic, phone

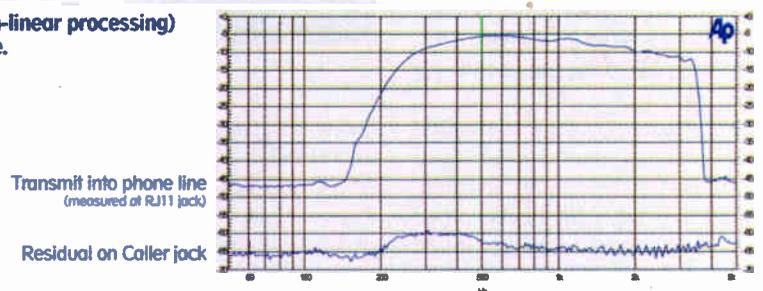
See X-MIXER, page 37 ▶



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## FACILITY PROFILE

# Greater Media Comes Home Again

*Detroit Broadcaster Moves to Bordes Broadcast Center, Just 450 Feet From Previous Facility; Converts to HD*

by Tom Vernon

When Michigan Governor Jennifer Granholm spoke at the dedication of Greater Media's Peter A. Bordes Broadcast Center in September 2005, it marked the end of a facilities move that had started five and a half years earlier.

The Detroit facility is home to WCSX(FM) "Classic Rock" 94.7, WMGC(FM) "Magic" 105.1 and WRIF(FM) "Riff Rocks" 101.1. The new building has 12 studios — one production room shared by the group, three studios for WMGC, three for WCSX and five for WRIF. The company declined to publicize the cost of the project.

Architect Paul Elia said the main idea behind the architectural and interior design of the Bordes Broadcast Center is that of a central hub. This is a large space that allows for the exchange of ideas; a place to gather for socializing and meetings. The hub has the formal aspects of a lobby and a boardroom. All spaces for the individual stations flow from it.

Windows have a special low-emittance coating that lowers heat loss; lighting fixtures are the most energy efficient on the market, designers said. Task lighting is used to focus light on the work surfaces where it is most needed. Lighting for the hub has a number of pre-set scenes that conserve energy.

## Site prep

The Bordes Center is on a 12-acre tract already owned by Greater Media, 450 feet from the old facility.

The first challenge facing Chief Engineer/Facility Manager/Building Project Manager Mike Kernen was site preparation.

The land had been used for a satellite uplink facility and had four 10-meter dishes and the support structure. In addition, there was a 30-foot high dirt berm and an 11-foot trench that had to be removed before 200 truckloads of sand could be brought in to level the site. "Site preparation took about a year," Kernen said.

As planning began, he gathered input from the staff and distilled it to basic business needs. "The hardest part was

## Major Contractors

Radio Systems - systems integrator  
Studio Technology - studio furniture  
E & L Construction - building construction

Paul Elia - Architect

Data Management - structured cabling  
Alpha Electric - electrical contracting

## Notable Hardware

Klotz Digital - consoles and routing  
Broadcast Electronics - AudioVault digital storage  
Radio Systems - StudioHub infrastructure  
Raritan Computer Inc. - KVM server  
Telos Systems - 2101 phone systems, ProFiler automatic program archiving  
Air Tools - profanity delay  
Genelec - powered speakers  
Workstations - Apple G5  
Software - ProTools



Outside views of the facility

trying to accommodate everyone's wishes." He also faced a common problem: a few key people who had been unwilling to participate in the design process complained about the finished product. Some last-minute changes and modifications were made as a result.

While Kernen focused on the project management aspect of the move, Radio Systems performed the systems integration, installing Klotz Digital consoles and routers, Radio Systems StudioHub infrastructure and Studio Technology furniture. Except for a few microphones, new equipment was used.

The Klotz gear formed the backbone of the audio infrastructure.

"These consoles and routers use fiber optic cable to eliminate about 70 percent of the wiring that would be needed for a traditional installation," Kernen said. Each console has only four connections: network, power, ground and phone. Source gear connects directly to the Klotz frame.

Another advantage Kernen cites to the Klotz system is built-in DSP capabilities, which eliminate a lot of outboard processing gear. Mic lines run directly into the Klotz frames for DSP processing. This eliminated 60 mic processors in the facility.

The Radio Systems StudioHub is a key element in the Detroit infrastructure. Through it, Cat-5 connections are made

to studios and the technical operations center. This infrastructure is used for some computer connections, contact closures and some audio connections.

StudioHub dongles, short cables that convert sources such as CD players and computer sound cards into Cat-5 connections, were another component of the simplified cabling installation. "There's no soldering, no punch block tools, they're fantastic," Kernen said.

## No traditional media

Kernen and his staff found an unorthodox application for their Telos Systems ProFilers.

"In addition to the intended archiving function, the ProFiler is great for re-creating 'best of' morning shows when staff members are on vacation," he said. The morning show segments can be edited and assembled easily from the ProFiler's MP3 files, with new commercial materials inserted.

The Detroit stations rely on an elaborate Broadcast Electronics AudioVault system for audio storage. Most studios have main/backup arrangements. The installation for WRIF and WCSX is unorthodox in that one AV system is dedicated to commercial content, while the other is used for music. WRIF has one AudioVault dedicated to the morning show and is used for sound effects, drops and other morning materials.

Kernen notes that except for a few CDs kept for emergency backup, there are no traditional media in the studios.

The computer infrastructure of the Bordes Broadcast Center relies on a KVM (Keyboard Video Mouse) server from Raritan Computer. This system allowed Kernen to locate the studio CPUs in the TOC, where they're backed up on the UPS.

Users in the studios call up a CPU via the KVM server. The system has the capacity to allow 256 CPUs to be accessed by 64 KVM connections. Studio monitors are flat-screen devices, eliminating the problems of heat, raster noise and extra studio furniture associated with traditional video monitors.

Kernen, a die-hard PC user, was partially converted to Macintosh by the stations' production staff. Apple G5 workstations with ProTools are used for most production.

"ProTools adds greatly to our production capabilities, while eliminating a lot of costly outboard processing gear," he said. "We've been able to create amazing imaging materials." A local reseller provided certified training for both Apple and ProTools to the Greater Media production staff.

There are no audio power amps in the studios. Kernen standardized on Genelec powered speakers. He added subwoofers above the ceiling in the air studios for improved bass response. "In the production rooms," he said, "the focus should be on voice quality, and subwoofers were not used. Bass should represent reality."

## Multicast

The transmitter building for WCSX and WMGC is on the same 12-acre site as the studio complex; WRIF's transmitter is four miles from the site. Audio from the studio is fed to the transmitter building via underground fiber, and connects to a Klotz frame. An AES out from the frame feeds the digital STL linking WRIF's transmitter.

Processing for all stations is handled by Orban Optimod-FM 8500s. Kernen cites the enhanced HD awareness, built-in delay and ability to maintain competitive loudness while preserving TSL as assets of the Orban gear.

Multiple layers of backup have been designed into the system. Most audio signals are distributed over two or three independent paths, eliminating a single point of failure. AES signals are routed to the transmitter building via StudioHub connections, backing up program feeds from the Klotz frame. AES routing at the transmitter allows an "evergreen" audio feed of generic music for each station to be available, along with the current commercial log, in the event of complete failure of the studio's audio feed.

Emergency power for studio and transmitter buildings is provided by an 800 kW Caterpillar generator with a 4,000-gallon tank for diesel fuel. The generator is located in the transmitter building, and feeds power to the studio complex via a 450-foot underground cable. A 120 kVA Eaton/Powerware UPS is available to run critical loads in the studios and TOC.

Work on Greater Media's Detroit facility didn't stop with the studio construction. After a brief respite, Kernen and his staff were busy once again, converting all the transmitter facilities to HD Radio. Greater Media Detroit is

See DETROIT, page 37 ►

# X-Mixer

► Continued from page 35  
channel setup, coarse channel gain set, internal mic preamps in or out, in-hand fader gain and monitor muting.

On the business side of running the board, you have three busses: Program, Audition and Mono. The Program and Audition busses are stereo, and have simultaneous analog and AES3 outputs. The Mono bus is strictly analog, but works nicely in developing a mix-minus bus for a remote location or ISDN backhaul feed.

The Cue bus does multitasking, including prefader mic send to the caller mix-minus bus and pre-fader audio to the cue system and operator headphones. The entire telco interfacing is flexible and operator-friendly.

Standard with the console is a remote line selector (RLS) in a 6x2 format. With the PC, you're soft here, too. Without the PC, the RLS defaults to the last two faders on board (not hardwired).

The Control Room Monitor and Timer are easy and functional. Monitor any bus, one external source (like an air signal) and talkback to a remote. Line level outputs for a monitor and headphone amp get you "hearing" your mix.

I still like watching VU meters. The X-Mixer has five of them, monitoring the three output busses, and a count-up timer. One feature I believe the console needs is peak-indicating LEDs. The maximum output level of the console is +24 dBu, and while this is a comfortable margin of headroom above 0 VU, once you exceed it in this console, the digital bus gets nasty at "all ones." In both the analog and digital outputs, you'll know — and so will your listeners — when the board operator is "pinning the needles."

Unlike analog consoles that typically give that distorted, over-driven grunge sound when pushed into clipping, digital clip is revealed in either a 'hole-punch' in the audio, or in this case a nasty ripping/tearing sound. With proper setup, including gain structure, in-hand fader control and operating training, you should be able to avoid this problem.

The board is a good value, and a good mix of traditional, time-proven design and digital flexibility.

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

# Detroit

► Continued from page 36  
multicasting on its HD channels. Kernan said the transition didn't add much to the construction time.

"The HD2 stations are completely automated, so all that was needed to accommodate them was the purchase and installation of three new AudioVault systems and the transmitting equipment," he said.

Reflecting on the new digital technology, he adds, "The feeling around the cluster is that we're inventing the playbook as we go. We are realistic about the limited listenership, but proud to be pioneers."

*Tom Vernon is a frequent contributor to Radio World.*



Arthur 'Big Daddy' Penhallow, WRIF's legendary 3-7 p.m. jock, on the air.



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### Product Capsule:

**Arrakis X-Mixer  
Digital Console**

#### Thumbs Up

- ✓ Line-lump power pack
- ✓ PC option expands console's capabilities
- ✓ Compact footprint

#### Thumbs Down

- ✓ "Last state" settings of fader on/off logic not maintained upon power cycle
- ✓ Lacking peak-indicating LEDs
- ✓ Digital clipping artifacts if levels and trim are not adjusted properly

PRICE: \$5,495

CONTACT: Arrakis Systems in Colorado at (970) 461-0730 or visit [www.arrakis-systems.com](http://www.arrakis-systems.com).

## PRODUCT EVALUATION

# Restoration 2.0 Rids Audio of Scratch

*TC Electronic's NR Software Tackles Crackle, Stops Pop, Offers Impulsive, Broadband NR*

by Read Burgan

Digital audio noise reduction software provides radio with the ability to give listeners an audio quality unimaginable just a few years ago. When NR software first appeared, those looking for ways to clean up long-play records tape-recorded interviews and noisy telco feeds greeted it eagerly.

The initial software left much to be desired. It often was unable to deal with certain kinds of noise and sometimes created artifacts worse than the original problems.

Great improvements have been made in the two basic types of NR tools: impulsive noise reduction, to eliminate pops and clicks; and broadband noise reduction, to eliminate continuous noise like vinyl record surface noise and air-conditioning sound. The improvements have been so great that the question is: Can a new entry into the NR software field offer any improvements?

TC Electronic thinks so. I have been using TC's Restoration Suite 2.0 for several months. Here's what I found.

## Bring in DeNoise, DeThump

Restoration Suite 2.0 is part of a growing number of software programs that require an add-on plug-in PCI card or an external USB external hardware box. This provides a DSP processor that transfers a portion of the software's processing from the host computer's CPU to the add-on processor. In this case the processor is the TC Electronic PCI MKII (retail cost \$1,495).

The PCI MKII card supports various software plug-ins available from TC Electronic or third-party providers. The software should run on any MAC or PC computer with an audio editor that supports VST or RTAS plug-ins. PC computers require Windows XP; Mac computers require OS X 10.3 or higher.

TC Electronic supplied me with a loaner card for my computer that comes with a number of useful, high-quality digital audio tools including compressors, equalizers and reverbs.

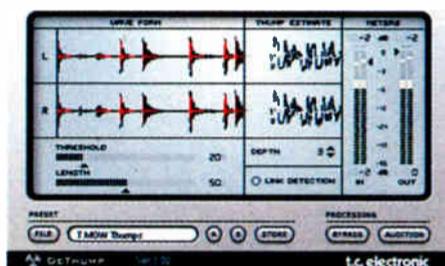
Restoration Suite 2.0 contains more tools than the typical digital audio NR package, featuring DeScratch, DeClick, DeNoise, DeCrackle and DeThump, new with this version of the software.

There is some overlap in the tools' functions. For example, both DeScratch and DeClick remove pops and clicks, and both DeClick and DeCrackle remove crackle.

DeScratch helps to set Restoration Suite 2.0 apart from other NR software. Until now, NR software has had problems removing large pops, clicks and scratches. Most impulsive noise filters do an adequate job of removing small to moderately large pops and clicks.

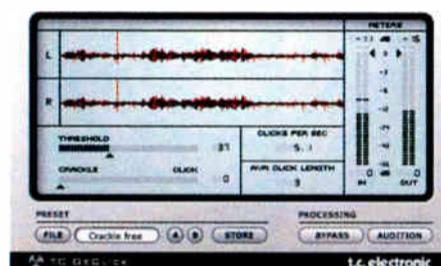
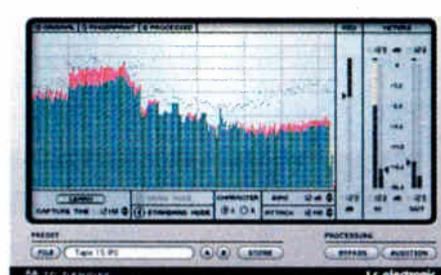
DeScratch is the first automatic digital

plug-in I have found that is capable of removing large pops and clicks without leaving artifacts in their place. It took me a while to set the various parameters properly, but once I did I was favorably impressed with its ability to remove many of the large pops and clicks that



remove the noise. There is a Time setting the user can adjust that affects how quickly the automatic noise print will change in relation to changes in the audio signal. I found that for most average situations in which there is a moderate amount of surface noise, Automatic mode performed well.

When it comes to the several seconds of silence between record cuts, lacking any audio to compare against the noise,



Clockwise from left: Restoration 2.0's DeScratch, DeNoise, DeClick and DeThump plug-ins offer waveform displays.

had eluded digital tools in the past.

DeScratch has three basic controls: Threshold, Scratch Size and Quality, plus an additional control for linking the channels. If you have a badly degraded recording with many pops and clicks, this plug-in can consume a lot of your computer's CPU — even with the add-on card's DSP taking on some of the processing load.

The Quality setting helps in situations where the CPU load is excessively high. You can lower the CPU load by selecting the lowest-quality setting. When you're satisfied with what you're hearing during the preview, you can reset the Quality control to the highest setting and run the process.

**A Ceiling slider allows the user to limit just how high the noise print will be applied. It recognizes that at high levels, the sound itself is often sufficient to mask the noise.**

Of the remaining tools in Restoration Suite, DeNoise offers features better than many similar offerings by other companies. It is designed to remove continuous noise such as record surface noise or tape hiss, and provides three different modes for noise removal.

The default setting is Automatic. In this mode, the software automatically evaluates the audio, determines what is noise and what is legitimate sound, creates its own noise print and removes the noise based on that. The only control the user needs to concern himself with is the Reduction slider, which determines how much noise will be removed by the noise print.

In Automatic mode, the software continuously evaluates the sound and changes the noise print as necessary to

Automatic mode may accept the surface noise as audio and not provide noise reduction. But as soon as the next cut begins, it is again able to distinguish between the sound and noise.

## Acting on impulse

Like traditional broadband noise reduction software, DeNoise has a Fingerprint mode that allows you to select a noise-only portion of the sound and create your own noise print, which the software will then use in removing the noise. You can set the capture time anywhere from 10 to 3000 ms.

Finally, DeNoise has Draw mode,

essentially a graphical editor that allows you to adjust an existing noise print created by the Automatic or Fingerprint modes, or create an entirely new noise print. In Draw mode, the noise print has a series of handles along the points of the noise print that can be dragged up or down to modify the shape of the noise print. New handles can be added or existing ones removed and the left and right noise prints can be independently adjusted if desired.

A Ceiling slider allows the user to limit just how high the noise print will be applied. A Bias parameter allows the user to move the entire noise print up or down by as much as 20 dB. This makes it easy to fine-tune the noise print.

DeClick performs the kind of impulse

## Product Capsule:

TC Electronic Restoration Suite 2.0 Noise Reduction Software

### Thumbs Up

- ✓ More tools than most NR packages
- ✓ New DeThump feature
- ✓ DeScratch plug-in removes large pops and clicks without leaving artifacts
- ✓ Plug-ins offer waveform displays

### Thumbs Down

- ✓ Some plug-in function overlap
- ✓ Automatic mode may accept surface noise as audio and not provide noise reduction

PRICE: \$1495

CONTACT: TC Electronic in California at (818) 665-4900 or visit [www.tcelectronic.com](http://www.tcelectronic.com).

noise removal associated with most traditional pop/click filters. It has only two slider controls: Threshold determines how much impulsive noise is removed, while Crackle determines what kind of impulsive noise is removed. If set all the way to the left, Crackle removes only crackle; if set to the right, it removes only clicks. I found that DeClick was effective in removing much of the smaller impulsive noise that remained after DeScratch had removed the larger pops and clicks.

DeCrackle is designed to deal with three different but related kinds of noise: Crackle, which often sounds like bacon frying; Buzz, the kind of noise that can be created by some lighting equipment; and Corrupt, where the signal has actually been damaged.

DeCrackle has three sliders plus a Type control. The Threshold slider determines how much of the signal will be affected. The Reduction slider determines how much the noise will be reduced. And the Crackle Size determines the size of the noise to be reduced. The Type parameter lets the user select the algorithm that will be applied: Crackle, Buzz or Corrupt.

Many applications won't even require the use of this plug-in. But when you need it, this particular plug-in can provide some necessary relief from noise that would otherwise escape removal.

DeThump is particularly designed to deal with low-frequency thumps and bumps. DeThump anticipates pops and clicks that might create low-frequency bumps, and removes them through a subtraction process that substitutes a replacement low-frequency content based on an analysis of the audio material immediately surrounding the problem area.

Each of the Restoration Suite's plug-ins have a waveform display that varies according to the kind of process the plug-in is applying to the audio. Some offer options that vary the display from Normal to Intensity to Outline. The displays provide a good indication of the problems being addressed and the process the software is applying to correct the problems. In particular, DeCrackle has a colorful sonograph display that is particularly useful in determining how much of the material is being removed by that plug-in.

Read Burgan is a former public radio station manager specializing digital audio restoration. He can be reached at [rgb@chartermi.net](mailto:rgb@chartermi.net).

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PRODUCT GUIDE

## MXL Shipping V67i Dual-Capsule Mic

MXL Microphones, the professional audio division of Marshall Electronics, debuted the V67i dual-capsule microphone, which the company says gives recording engineers two mics in one.

The V67i's front capsule incorporates dual, large one-inch gold-sputtered capsules, and is the same 6-micron capsule used in MXL's V67g cardioid condenser mic. The back capsule uses a proprietary material that simulates vintage capsules characteristic of early 1960s tube mics. A red LED on both sides of the mic, behind the grille, indicates which side is active, particularly useful in low-light conditions. A Warm/Bright switch resides on the mic's front.

The V67i has a gold grille and a dark green body like the V67g. Unlike the V67g, the V67i features an improved solid-state preamp with balanced transformer output.

The V67i retails for \$199.

For more information, contact Marshall Electronics in California at (310) 333-0606 or visit [www.mxlmics.com](http://www.mxlmics.com).

## AKG Headsets Mix Headphones, Mics

AKG Acoustics added high-directivity dynamic and condenser microphones to its circumaural K 271 and supra-aural K 171 studio headphones in developing a line of professional headsets. Five headset models are available.

The HSC 271 combines the K 271 headphones with a shock-mounted cardioid condenser mic. The HSD 271 has a hypercardioid dynamic mic with high off-axis rejection. The HSD 271 Single has a single earpiece, which lets the user hear the ambient sounds of the environment while wearing the headset.

The HSC 271 and HSD 271 models have an auto-mute function that silences the headphones as the headset is taken off.

The HSC 171 included the K 171 headphones and a cardioid condenser mic. The HSD 171 uses the same headphone with a hypercardioid dynamic mic.

Features are included for on-air broadcast, post-production, intercom, recording and monitoring, such as microphone boom arms that swivel 270 degrees to allow the user to quickly place the mic on the right or left, and have gooseneck arms that pivot horizontally to ease positioning.

Intelligent muting control silences the mic when the boom arm is moved away from the user's mouth. The company says a detachable cable with locking six-pin mini-XLR connection eases transportation and storage, and self-adjusting headbands and gimbals-suspended ear cups lets users customize fit.

The HSC 271 and HSD 271 retail for \$549. The 171 versions, either condenser or dynamic, retail for \$479.

For more information, contact AKG Acoustics in Nashville at (615) 620-3823 or visit [www.akgusa.com](http://www.akgusa.com).



## ADA Releases HD Pro Dual-Tuner Receiver

Audio Design Associates has debuted the HD Pro dual-tuner HD Radio receiver.

Main features include two HD Radio tuners, split-mode capacity for simultaneous analog/digital comparison and 2 RU size.

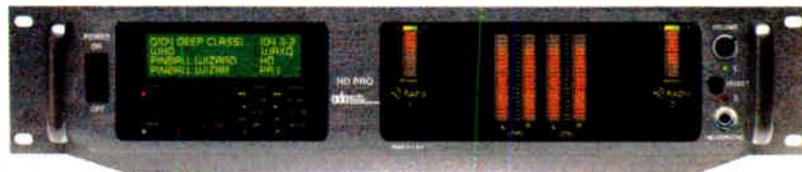
Front-panel features include four-line LCD data storage display; tuning control; dual stereo 20-step VU meters with peak-hold indicator; and 15-watt stereo headphone amplifier with A/B switch and volume control.

Rear-panel features include dual F-type 75-ohm antenna inputs; stereo analog audio outputs; TOS-link optical audio outputs; +10 dBV balanced analog audio outputs; balanced digital audio outputs; ADA Bus data port; and Ethernet T 10/100 or RS-232 control port for PC control of the HD Pro.

Additional highlights include a 2 RU option, relay contact warning outputs for signal loss, HD loss and audio loss; force-air fan cooling; and switched AC (EIC female) outlet.

The ADA HD Pro tuner retails for \$3500. It is sold factory direct from Audio Design Associates or through Broadcasters General Store in Florida at (352) 622-7700, or [www.bgs.cc](http://www.bgs.cc).

For more information, contact Audio Design Associates in New York at (800) HD-AUDIO (432-8346) or visit [www.ada-usa.com](http://www.ada-usa.com).



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**Eagle**  
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**Course**  
The COURSE, a 4-unit chassis, with control software and dual power supplies accommodates up to 10 communication boards: dual channel ISDN codec, Digital Hybrid (analog line) or V35/X21, and soon to be released IP codec.



**TH 02**  
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# Buyer's Guide

Tech Updates



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Radio World

Audio Processing

June 7, 2006

USER REPORT

## WGUC Taps NeuStar Plus to Jazz Audio

*The Pubcaster Utilizes the Codec Preconditioning Tools of Neural Audio's System for Its HD-2 Channel*

by Don Danko  
Vice President of Engineering  
and Operations  
Cincinnati Public Radio

and by Alex Kosiorek  
Audio Recording and Mastering  
Engineer  
WGUC(FM)

**CINCINNATI** When we first heard about digital radio and its promised features and benefits, we got excited about the possibilities it offered in delivering high-quality digital transmission for our listeners at WGUC(FM) in Cincinnati. Our optimism was tempered somewhat by the restrictions imposed by the bit rates of the HD Radio codec.

WGUC classical and jazz listeners tend to expect a higher degree of broadcast quality of the audio they listen to than those of other music genres. We wanted to ensure we delivered a product that our listeners expect, given the bit rate restrictions as well as the competitive nature of radio.

By correcting anomalies in audio content before they are encoded through the HDC codec, NeuStar Plus enables quality audio at low bit rates. Once bit-intensive audio anomalies have been reduced, NeuStar's parametric architecture adjusts dynamics and spectral shape without one setting affecting the other.

Setup for the NeuStar system was easy. We connected the NeuStar box to the Harris Importer with an AES connector. Help from the Neural service staff was unnecessary, but our experience has always been positive when dealing with the Neural tech support.

It has been installed for approximately three months and has exceeded our expectations in improving the audio quality of the lower bit rate second channel. At first the second channel was set up for 48 kbps but after a week of testing we decided to test the quality at 32 kbps. After listening to that, we were so impressed with the quality we left it at that rate.

The decision to broadcast at 32 kbps has been confirmed by feedback from some of our listeners who have pur-

chased a new HD Radio to listen to our second-channel jazz format. They have all been impressed with the audio and the channel.



Alex Kosiorek and Don Danko with WGUC's NeuStar Plus

Looking forward to WGUC's plans for HD Radio, we think that the potential for surround sound and datacasting is enormous. We are likely the only station that is extensively testing all the surround sound tools available like Dolby PLII, SRS Circle Surround, Lexicon/Harmon Logic 7 and Neural Surround 5225 for both HD Radio and standard analog FM.

We have found a great deal of promise

neers. Preconditioning has proven itself indispensable for HD Radio as well as other codecs. We are looking forward to testing the latest version of the NeuStar software and hardware.

For more information, including pricing, contact Harris Corp. in Ohio at (513) 459-3597 or visit [www.broadcast.harris.com](http://www.broadcast.harris.com); or Neural Audio in Washington state at (425) 814-3200 or visit [www.neuralaudio.com](http://www.neuralaudio.com).

**The decision to broadcast at 32 kbps has been confirmed by feedback from some of our listeners who have purchased a new HD Radio to listen to our second-channel jazz format.**

**They have all been impressed with the audio and the channel.**

After looking at the data that had been produced, we realized in order to maximize the quality of an already limited system, we needed to use coded preprocessing. After evaluating Neural Audio's codec preconditioning tools, we heard the difference those tools had on improving the performance quality of the digital codec, and we decided to go with Neural's NeuStar system for our HD-2 channel, which is a 24/7 jazz format.

### Preconditioning process

The NeuStar system combined with our Harris Z16HD transmitter, a Dexstar exciter, a FlexStar Exporter and an EI Intraplex STL on our privately owned fiber optic cable (approximately two miles between studio and transmitter sites) helps us achieve the sound quality we were looking for through its approach to codec preconditioning.

chased a new HD Radio to listen to our second-channel jazz format. They have all been impressed with the audio and the channel.

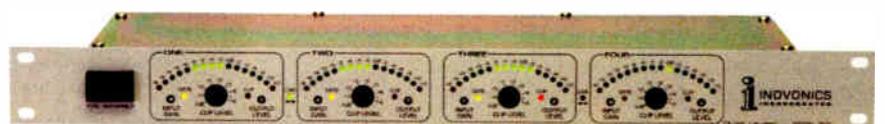
If we had one criticism of the NeuStar Plus system it is a lack of ability to visually monitor and fine-tune the preconditioning process and dynamic range controls, but that seems to be changing. Neural says it has been in correspondence with several engineers (including Alex Kosiorek) who are not only concerned with the quality of the audio, but also with the user interface and tailorability of the tools to be utilized.

Alex was able to get some hands on experience with the beta version of the NeuStar SW4.0 software that was introduced at NAB2006. He was impressed with the cutting-edge methodology and the focus on detail to overall quality of the product. The NeuStar SW4.0 has a

TECH UPDATE

## Inovonics 264 Has Four Channels Of AGC, Peak Control

Inovonics debuted its Model 264 quad leveler, which contains four separate and independent channels of audio AGC and peak control. The channels may be used separately for microphone leveling and other monaural applications, or selectively linked for dual stereo or split mono/stereo program control.



The 1 RU Model 264 operates within the analog domain and uses Class-D (PWM) technology to stabilize operation. A combination of peak and average response to program dynamics allows the 264 to normalize the average-to-peak ratios from diverse audio sources to a common value. The company says the 264 maintains a consistent level of subjective loudness without compression of program dynamics that can fatigue listeners.

Inovonics' Model 264 retails for \$1200.

For more information, contact Inovonics in California at (831) 458-0552 or visit [www.inovon.com](http://www.inovon.com).

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## USER REPORTS

# PodSqod.com Demos 6200 in Real Time

*Studio1A Uses AirTools' Two-Channel Voice Processor in Syndicating Apple iTunes Podcasts*

by **Mark Jensen**  
**Managing Partner**  
**Studio1A Productions**  
**PodSqod.com**

**ORLANDO, Fla.** The AirTools line, including the 6200, has a brushed aluminum front panel that is sparse on traditional controls. Fit and finish is good and the one-knob/six-button front panel feels sturdy enough for the "on-air" guys. A downstream, type-B USB adapter is provided on the front panel for direct connection to a PC. The blue-on-black LCD matrix display lends a nice look, although I mainly used this to monitor whether the unit was in bypass or online mode at a glance.

As a long-time user of many analog Symetrix 528Es in the studio, I thought it was time to bring Studio1A Productions into the 21st century with digital studio processing. Although the analog 528Es have served me well, the 6200 brings pragmatic advancements to studio voice processing.

save yourself a lot of time and program the 6200 with the Designer software.

The processing modules include high-pass/low-pass and shelving filters, a de-esser, downward expander, compressor-limiter/AGC leveler, four-band parametric EQ and symmetry control. As I talked with a station engineer who needed to tame the morning guy's aggressive audio style, I was reminded of the 6200's ability to access any of its 256 voice profiles based on time-of-day, ESE time-code or MIDI.

For large installations, arrays of 6200s can be remotely controlled via Ethernet right at the engineer's desktop, on the fly.

Using the AirTools Designer software, you first connect locally or remotely to the 6200. After a connection is made, you are shown the recent log entries for the device to monitor any resets, power on/offs and the current device time. The 6200 has security features that keep prying talent from making "adjustments." The bottom portion of the Designer follows a simple modular drag-and-drop



Mark Jensen at Studio1A Productions

The advantage of a 6200 is the ability to use its two channels of processing discretely, or tie them together for stereo processing. Where I needed eight 528Es, four 6200s will get me the same processing horsepower. The analog inputs are continuously adjustable from direct line to mic-level input. Input connectors are XLR with your choice of analog or AES. If you're using analog, the signal goes A/D at 24-bit, 48 kHz.

#### Core controls

The front-panel USB connection provides a quick way to take control of the processor locally. After installing the freely downloadable 6200 Designer software on my PC, Windows found the processor. You also can control/configure the processor via Ethernet with the RJ-45 connector on the back panel. Although you can access the 6200's configuration settings from the front-panel buttons,

philosophy that takes a few clicks to master. You also can change the order of modules in the chain. Say you want to put the de-esser module in front or back of the compressor, it's your choice.

Latency is a critical issue. The 6200 specifications quote 0.5 ms, and I can say from experience that the delay is not perceptible in the headphones. The compression is smooth and the AGC tames your overall levels well.

The downward expander was a too touchy and wasn't quite as smooth as that of the venerable analog 528E. To my ears, evening out the waveform symmetry actually took away from the body of the sound, so I just turned it off. To the 6200's credit, off-symmetry issues were almost non-existent after processing and I wasn't dealing with any DC offset issues.

The ease and visual feedback of the

See AIR TOOLS, page 43 ▶

# Easyrider Drives Model 230 for Salem

*Stations Trade Previous Unit With Audible Artifacts For Aphex Voice Processor With Tube Preamp*

by **Mark Pallock**  
**Director of Engineering**  
**Salem Communications**

**LOS ANGELES** We have five stations located in our Glendale, Calif., facility — three AMs: KRLA, KXMX, KTIE, and two FMs: KKLA and KFSH. Programming for all five is more or less built around our on-air personalities. Getting each voice "right" is a difficult job, regardless of whose it is and the individual's mood that particular day. Having acoustical environments that are less than perfect adds another hurdle to overcome.

the output level was the same as when he was talking softly.

Some of our studios are not completely soundproof. Some of them have a reflective large glass window. And all the studios are wired for several mics. The 230's gate effectively cut the leakage and the slapback. It also eliminated the phasing problems when more than one mic is open in a studio. The gate's operation is smooth and accurate, so it does not "feel" like there is a gate.

The Big Bottom adds a nice richness and warmth to voices. It does not cause muddiness, but rather a more intimate sound. The Aural Exciter adds presence



Mark Pallock and Frank Pastore

We had been using what was considered the industry-standard mic processor, but I was not satisfied with its performance, finding it noisy with audible artifacts from the dynamics processing.

I am a big fan of vacuum tube technology. So when I heard that Aphex had introduced a voice processor with a tube preamp section I called to get a demo. The Model 230 Master Voice Channel is a single-channel combination of preamplifier, Easyrider compressor, Logic Assisted Gate, split band de-esser, Big Bottom, EQ and Aural Exciter. It also has a 24/96 A/D in addition to analog line-level output.

As soon as I got one, I put it into a studio and found it to be clean, open and detailed. And that was before I started playing with the processing.

#### Voices carry

We use Neumann TLM 103s throughout the facility, and the 230 can handle high-level inputs without breaking up. And some of our hosts can start screaming, especially when a caller is not in full agreement. While our previous unit "choked" the voices, the Easyrider compressor in the 230 controlled the voice without any pumping or breathing. You could hear that the host was yelling, but

and detail. I use the single-band EQ to add just a little boost on lower mid-range.

Since it is an analog device with no presets, I was concerned that I would have to set it for each talent and each guest. I found that by being moderate, especially in the Big Bottom, Aural

**You could hear that the host was yelling, but the output level was the same as when he was talking softly.**

Exciter and EQ section, I could use the same settings for the most raucous male voice, as well as a soft-spoken female.

For example, former Cincinnati Reds pitcher Frank Pastore hosts a popular afternoon show on KKLA, and has naturally good pipes. Before we put in a 230,

See APHEX, page 43 ▶

TECH UPDATES

### Omnia ONE Has Livewire Interface

At the spring NAB show, Omnia Audio debuted the 1 RU Omnia One FM audio processor, which features a Livewire audio interface that facilitates direct integration with the user's Axia IP-Audio network.

Highlights include multiband AGC and limiting, bass management controls and a final clipper.

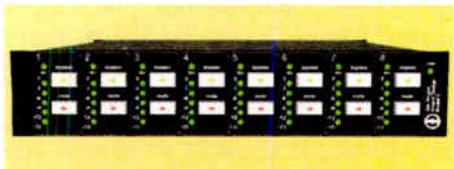


The front panel has LED input/output meters, and a headphone jack with volume control. The Omnia ONE can be adjusted from the front panel or via a Web-based remote control program. The back panel offers several inputs and outputs. Audio can be carried on analog connections, AES-3 digital, or Livewire input and output, with automatic failover available on the input.

For more information, including pricing, contact Omnia Audio in Cleveland at (216) 241-7225 or visit [www.omniaaudio.com](http://www.omniaaudio.com).

### Dan Dugan Model E Aids Mixers With Multiple Mics

Dan Dugan Sound Design says its Model E automatic mixing controller helps professional audio mixers handle multiple live mics without having to continually ride their individual faders. The eight-channel processor patches into the



input insert points of an audio mixing console.

The company says the Model E detects which mics are receiving input and makes transparent crossfades, freeing the mixer to focus on balance and sound quality instead of being chained to the faders.

The Model E's voice-controlled crossfades track unscripted dialog, and mitigate cueing mistakes and late fadeups while avoiding choppy and distracting effects common to noise gates.

Additional highlights include its half-rack size, and ability to link units for up to 64 mics. The retail price is \$2995.

For more information, contact Dan Dugan Sound Design in San Francisco at (415) 821-9776 or visit [www.dandugan.com](http://www.dandugan.com).

### AirTools

Continued from page 42

high/low and shelving filters were a pleasure to work with. I dropped the bottom end slightly and did a gradual high-end roll off, as I'm encoding voice MP3 at 128 kbps. Adding a small bump at 1.2 kHz gives a slight presence boost to my voice. This took seconds thanks to the 6200's Designer. The de-esser did a good job at taming the snakes and after repeated tinkering, I decided to leave the EQ pretty much flat. However, it's nice to know the parametric EQ is there and works well if you need it.

The 6200 offers bang for your budget; especially considering the two-channel discrete factor. It retails for \$2,099.

AirTools is a division of Symetrix Inc. For more information, contact Symetrix in Washington state at (425) 778-7728 or visit [www.symetrixaudio.com](http://www.symetrixaudio.com).

### Aphex

Continued from page 42

his on-air voice sounded flat, almost anemic in comparison to his own voice. With the 230, his voice sails through on air with a natural, open presence.



A new female personality, Cindy Dole, does a weekend show on our FM. Her natural voice is small with little projection. Through the 230, with the same settings as Frank's, her voice is punchy, warm, rich and full. She also works on another radio station in this market and

her voice on that station has nowhere near the same audio quality.

Eighty percent of our audience listen to our stations in cars. It is essential that our on-air talent be intelligible over the drone of the road noise, yet still be natural and warm when listened to on a high-quality system in a quiet environment. Since we started putting in the Model

230s that goal has been met. And the side benefit to me is that the program directors and talent are happy.

The Model 230 retails for \$799. For more information, contact Aphex in California at (818) 767-2929 or visit [www.aphex.com](http://www.aphex.com).

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## USER REPORT

# Orban V2 Has Redesigned Code

*BoomerRadio.com Uses V2 With Internet Streaming Encoders, Notes Music Definition, Cut Consistency*

by Gary Blau  
Chief Technology Officer  
Integrity Media Group Inc.,  
Owner of BoomerRadio.com

**MIAMI** Since its debut more than two years ago, Orban/CRL's 1100 has found favor with webcasters and HD/DAB radio broadcasters. It incorporates the processing functionality of the company's Optimod-DAB 6200S onto a PCI card, and offered an affordable price for a hardware-based processor.

The latest software update, V2, is a complete code redesign that runs on the current DSP hardware card, giving the user the HD/DAB processing power of Orban's 8500. Current 1100 owners can download a free upgrade to the new code. The 1100 can be installed in an HD Radio importer PC, so it's also suitable for HD2 processing.

V2 incorporates most of the processing features in an 8500 FM/HD unit, including a stereo enhancer; the new "windowed" two-band AGC; added EQ features like a defeatable phase rotator, bass shelf equalizer, adjustable high- and low-pass filters, intelligent high-frequency



Orban/CRL 1100

misbehavior of perceptual codecs when presented with highly processed audio, especially in the high-frequency area. Orban says it's doing some proprietary tricks in the five-band compressor/limiter to make the output more codec-friendly, particularly regarding the spectral energy distribution in the higher frequencies.

**The final look-ahead peak limiter is another redesign. It provides a wider and more useful gain control range than the original and delivers better sound quality.**

enhancer, and the three-band parametric equalizer; a five-band compressor/limiter; and a final look-ahead peak limiter.

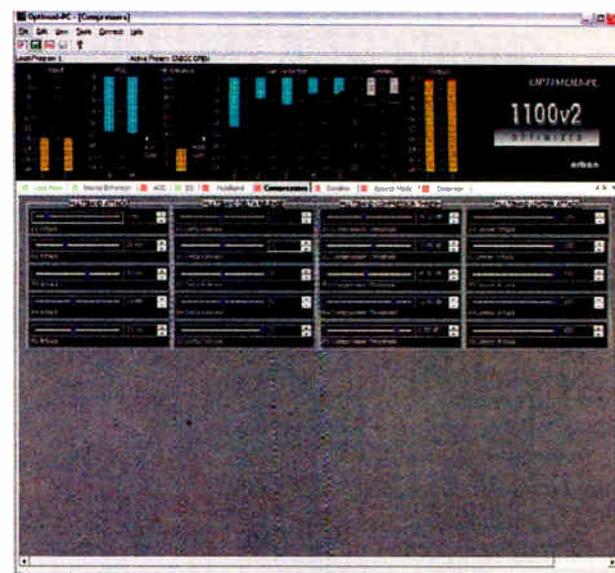
The two-band AGC improves on the original design by offering "windowed" release action, as well as ratio adjustment and matrix mode operation if desired, giving flexibility and control range capability.

The five-band compressor/limiter is a newer design than the one found in the 8500, and incorporates techniques Orban calls "Precode" to help reduce some of the

The final look-ahead peak limiter is another redesign. It provides a wider and more useful gain control range than the original and delivers better sound quality.

#### Webcasting

For webcasting purposes, where output levels from automated playout systems vary widely from cut to cut, V2 is effective in moving the processing window around to keep things in the sweet spot. The "window" action of the AGC can be adjusted to work in harmony with the



The 1100V2 Control Application's screen

five-band limiter to maintain a pleasing illusion of dynamic contrast and openness, while keeping average loudness and peak control consistent.

BoomerRadio.com's experience with V2 has so far been limited to use with our Internet streaming encoders, including Orban's Opticodec PE aacPlus encoder and Windows Media 9. Audible improvements were obvious, with a typical comment being that the V2 delivered more apparent definition and detail in the music, as well as improved cut-to-cut consistency.

The apparent reduction in codec artifacts on our low bit rate Windows Media streams was modest, but quite noticeable in side-by-side comparisons. Our aacPlus streams open up and impress. I'd expect similar results with the HD Radio codec. The original 1100 code wasn't bad, but the V2 plays louder and cleaner.

Along with the free aacPlus plug-in for Windows Media Player, the 1100V2 Optimod PC/1010 Opticodec PE package includes a webcasting system that delivers streaming audio to a Windows desktop.

1100V2 can be operated in "dual mono" mode, so some users might like to split the left and right inputs and outputs into two separate mono streams for HD2/HD3 or webcast channels. This saves expense on additional processors. Perhaps future driver updates could address this.

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

## TECH UPDATES

## Danagger Adds 'Classic' Model To Plan B Line

The Plan B Classic from Danagger Audio Works is a midrange model in the Plan B series of dead air prevention devices; it offers features for network repeater applications. It



provides automatic backup and switching for digital and analog program lines; the company says groups can standardize on a solution for program feed protection, switching and monitoring.

Plan B Classic accepts an external closure to inject local audio from the system's internal DVD drive or Compact Flash card and automatically rejoins the network after a break. Like other Plan B models, the Classic detects digital or analog program feed failures and provides continuous replacement audio while notifying station personnel via voice remote control. External closures also can trigger automatic notification, making the unit suitable as a remote control for installations like repeaters.

Each unit can have a separate ID number to identify which network site is reporting a problem. Users also can call the Plan B Classic to monitor program and backup audio, manipulate relays, monitor status inputs or make emergency phone-to-air announcements. Danagger included a monitor amplifier with stereo speakers and a headphone jack in the Plan B Classic's 2 RU aluminum rack mount chassis.

A "Plus" option allows backup audio to be injected from an alternate external digital or analog program source, like a secondary STL or off-air receiver. This option can be ordered separately and installed by the user. Plan B models now use interchangeable modules, allowing a Classic to be upgraded to the IP-equipped Plan B Deluxe at a later time.

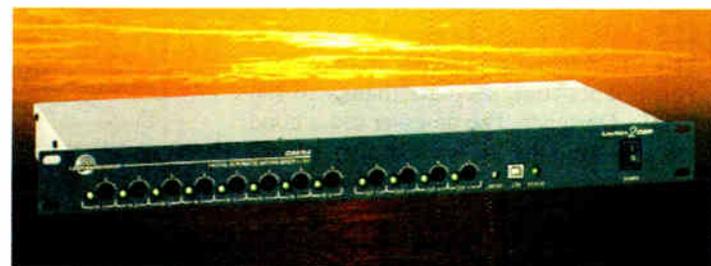
The Plan B Classic is shipping and retails for \$3,095.

For more information, contact Danagger Audio Works in Canada at (888) 892-8346 or visit [www.danagger.com](http://www.danagger.com).

## Lectrosonics: Processing, Mixing For Multiple Mics

Lectrosonics debuted the DM84 digital audio processor, which it says provides configurable processing, mixing and routing capabilities for sound reinforcement requiring multiple microphones and loudspeakers.

The DM84 routes a combination of inputs to a combination of outputs, and also offers auto mixing via a Proportional Gain algorithm; filtering on each input and output; delay on each input and output; and low throughput latency. It runs on DSP architecture and can be integrated as part of a larger system by connecting other DM units, such as the DMTH4 digital telephone hybrid, via the Digital Audio Network Interface bus.



The DM84 offers eight mic/line inputs with four outputs, switchable phantom power to handle condenser microphones; programmable front-panel gain control knobs for adjustments; and auto mic mixing with Proportional Gain and AutoSkew.

The retail price for the DM84 is \$2,295.

For more information, contact Lectrosonics in New Mexico at (800) 821-1121, or visit [www.lectrosonics.com](http://www.lectrosonics.com).

## TECH UPDATES

## Digiplexer Offers MPX Integration

Audemat-Aztec's FMX410/480 Digiplexer is a "5 in 1" composite signal generator that includes functions such as a sound processor, digital stereo generator, full FMB10/FMB80 RDS encoder, DARC encoder and digital composite clipper in a 19-inch rack.



DSP technology enables internal or external synchronization of sub-carriers. The FMX410/480 may be controlled through its 10BaseT Ethernet and has an embedded Web server. The following network protocols are supported: TCP/IP, Telnet, FTP, HTTP, SNMP, SMTP and MIB integration.

The company says the latest version of the unit integrates MPX (modulation) power limiter to enable deviation level and MPX power conformity.

The FMX410 retails for \$4,100. The FMX480 retails for \$5,600.

For more information, contact Audemat-Aztec in Miami at (305) 249-3110 or visit [www.audemat-aztec.com](http://www.audemat-aztec.com).

## Aeromax-HDFM: Processing for Main, HD Paths

The Aeromax-HDFM multichannel digital processor from Linear Acoustic uses programmable audio processing for a station's main FM and HD/digital radio signal paths, in addition to providing separate multiband processing for up to two supplementary audio channels.

The unit also provides 5.1 surround sound encoding via the company's compatible matrix system.



Processing functions such as two-band AGC, multiband compression and limiting, stereo enhancement, source noise reduction and multiband look-ahead peak limiting are provided for the FM and HD signal paths. Signals are split into two paths at this point.

The HD audio is output as an AES-format digital signal, while the FM audio is upsampled and then further processed with the standard 50- or 75-microsecond pre-emphasis, filtering and distortion-minimized clipping before being applied to the digital stereo encoder. After stereo encoding, clipping can be applied to the resulting composite signal.

The composite baseband signal is combined with externally applied SCAs and output via a high-current driver capable of interfacing with an exciter.

For more information, including pricing, contact Linear Acoustic in Pennsylvania at (888) 292-3117 or visit [www.linearacoustic.com](http://www.linearacoustic.com).

## DSPXtreme Has Touchscreen, Multipath Reducer Plug-In

BW Broadcast says the DSPXtreme six-band broadcast audio processor is the big brother to its DSPX and DSPXtra audio processors. The remote control options of the earlier processors have been extended; and the DSPXtreme supports 802.11 wireless connections in addition to hardwired traditional LAN and serial (RS-232) interfaces.

The 2 RU DSPXtreme offers a front panel with two LCD color screens, one of which is touch-sensitive; and the stereo encoder from the DSPX and DSPXtra is standard.

An option for diversity delay is available so the FM processed path can be delayed to match the HD path, valuable to stations that simulcast on FM and HD systems. Six bands of audio limiting, distortion controlled clipping and look-ahead limiting are featured.

Additional highlights include real-time clock scheduling (day-parting); A/B auditioning; sample rate converted digital I/O with sync input; 24-bit 128x oversampled A/D and D/A converters; and 28-bit DSP processing.

BW Broadcast says a range of plug-ins is available for the DSPXtreme. The Ariane Sequel RMS leveler is available as an option to replace the standard four-band AGC contained in the unit. The multipath reducer shapes the stereo subcarrier energy in an FM broadcast to suit a particular coverage area to reduce multipath effects. The DSPXtreme with "Ariane Inside" option retails for \$9,995.

For more information, including pricing, contact BW Broadcast distributor Broadcasters General Store in Florida at (352) 622-7700 or visit [www.bgs.cc](http://www.bgs.cc).



photo credit: Carol J. Forman Photography

Ben Hill  
Chief Engineer,  
WIP Radio, Infinity Broadcasting  
Bala Cynwyd, PA

## STUDIOHUB+ CASTING CALL

"WIP Sports Radio it is an aggressive, male-oriented station. Things move fast here and we're constantly moving between remotes and guests in the studios. StudioHub makes it easy for us to do this because it's simply pulling one CAT-5 connector out and plugging it in someplace else."

"Back in the old days it was solder fumes going up your nose, punching and crimping all day on your knees and lying on your back. It used to kill me, working on these projects, and I did a lot of them over 30 years. I just hated to do them."

"The whole (StudioHub) idea of CAT-5 twisted pair audio sounded like a match to me and it works great. It's really easy to use. We've put away the soldering irons and the punch tools. It's made our jobs a lot easier."

"This is a great innovative product. The past was so arduous and so laborious. It took forever to build studios and of course management never understood that. Now, with StudioHub we just get it done."

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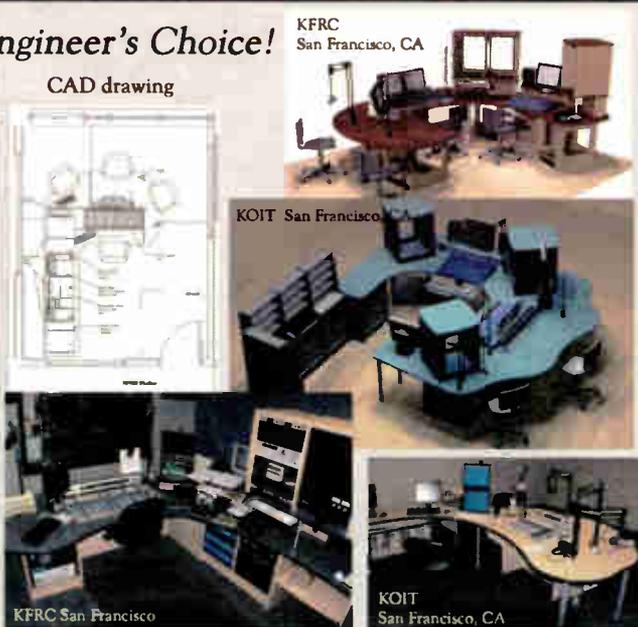


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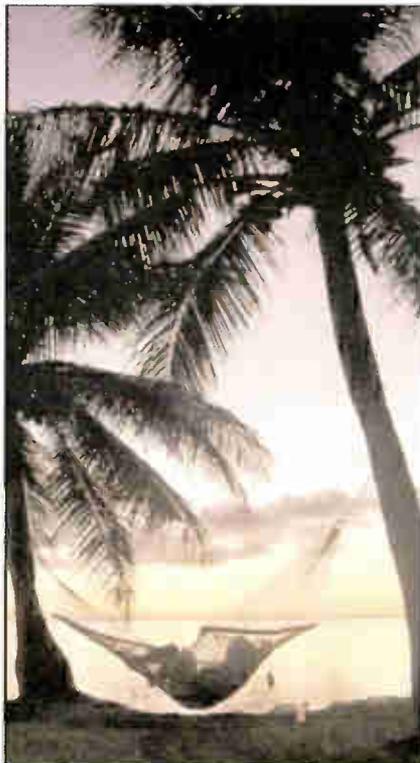
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USER REPORT

# Multicast Suitable for Low Bit Rates

*Cumulus Broadcasting Selects Omnia's Multicast Processor for Sensus Technology, 24-Bit Platform*

by Rob Chickering  
Engineering Manager  
Cumulus Broadcasting Dallas

**DALLAS** The first thing I noticed about the Omnia Multicast audio processor is the advantage of the Sensus technology. When approaching the lower HD bit rates of 48 kHz and below, the limitations of the HD codec start to become more apparent.

When operating at 32 kHz or below, we have found that Sensus is quite useful. The difference it makes can be heard particularly on voice material at these low bit rates. There are fewer odd artifacts and the voice is more pronounced.

As far as setup goes, Omnia Multicast was easy. From your input level, select a preset and then set the processor for the bit rate at which you are coding — there are selections for bit rate — and then set the output levels. Like the other Omnia processors, you can get in under the hood and make adjustments like attack and release time or various mixing levels or limiting thresholds.

An additional plus is the roll-off filter in the input section of the Multicast. This feature will be useful for processing AM HD.

**Low bit rates**

We at Cumulus have some experience with Omnia3.net, which is used for Internet processing, and it was good; it managed the audio spectrum properly and had intelligent look-ahead limiting for the benefit of coded audio streams. But a different level of audio performance is expected from FM HD Radio than is expected from the Internet, and as we're moving into broadcasting HD2 and perhaps later HD3 and HD4 streams over our FM channel, we knew we had to have something better.

That's where the Omnia Sensus technology helps, as it reduces the coding artifacts at low bit rates. While we were happy with the Omnia 3.net, when the Sensus technology was added and a few things were changed to give us the Omnia Multicast, it was exactly what we were looking for to process these low bit rate streams.

When we're talking about HD audio,

especially in the lower bit rates, the audio needs to be processed by a processor that is designed for the purpose of multicasting low bit rate audio. For instance, an AM station won't sound good with an FM processor. The Omnia Multicast was designed to do low bit rate audio.

infrastructure to compete against satellite, iPod and even WiFi audio streaming. This is the radio industry's way of offering some options to listeners. Thus we are left to do our best with limited data rates. There are limited HD radio choices out there right now and HD Multicast is not yet being driven as a revenue generator.

Right now, we as broadcasters are still in the stages of getting the stations in the HD alliance on the air and expos-



Additional features include an internal sampling rate of 384 kHz; a three-band dynamic peak limiter with feed-forward/feed-back design and intermodulation distortion reduction plus wideband AGC; Omnia's bass management EQ with up to 12 dB of bass boost; and remote control via serial, optional Ethernet or optional dial-up connections.

Ninety-six kHz HD is incredible, but the need for additional channels via multicast on HD FM is being driven by the radio industry's desire to provide an

ing listeners to more alternative formats, so that as more receivers come to market, people will realize, "Hey I can pick up 60 channels for free if I just have the right radio, and I don't have to pay a monthly satellite subscription or log on to a Web site to listen to different streams. I can be totally portable or listen in my car and have a great selection that previously I didn't have."

The Multicast retails for \$4,310.

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

TECH UPDATES

## Model 500 PH Reduces Room Noise

AIRCorp says recent clients of its Model 500PH Pro Announcer microphone processor include NextMedia Group, Greenwood Village, Colo.; Emmis Communications Chicago; Citadel Broadcasting, Las Vegas; University of Tennessee, Knoxville, Tenn.; Norfolk, Va.-based MaxMedia; and WRAL(FM), Raleigh, N.C.

The Model 500PH is for the broadcast studio or remote. Its input levels can be remotely controlled to correct levels between announcers. When levels are correct, the EQ can be established with no further adjustment. The company says the Pro Announcer's compressor/expander combination reduces room and equipment noise, while providing level control and increased loudness for the announcer.

Features include front-panel selection of input level in four ranges, +4 dB to -50 dB; three-section variable boost and cut equalization for setup without increasing low-frequency room rumble and system hiss; symmetry correction (phase rotators), which AIRCorp says offers more talk power with less compression; and Dynamic Control Coupling, to eliminate the "hollow room" flanging effect.

The 500PH Pro Announcer retails for \$799.

For more information, contact AIRCorp in Texas at (972) 304-0455 or visit [www.aircorp.biz](http://www.aircorp.biz).

## Orban 9400 Features Analog, Digital Processing Chains

Orban's Optimod-AM 9400 offers two independently adjustable processing chains: one for the analog channel and one for the digital channel. The company says the only processing common to the two channels is the AGC and stereo enhancer.

Features include an equalizer, five-band compressor/limiter and peak limiter, each optimized for its intended transmission channel. For example, the analog-chain peak



limiter uses Orban's multiband distortion-canceled clipper and overshoot compensator, while the digital chain uses a low-IM look-ahead limiter to make the most of low bitrate codecs.

Both processing chains are stereo, making the 9400 suitable for CQUAM installations. The 9400 retails for \$7,990.

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

## Eventide Anthology II Adds Parametric EQs

Eventide is shipping its Anthology II software bundle, which features 15 plug-ins and two 48-bit double precision vintage equalizers.

The E-Channel plug-in is a channel strip with a configurable signal path. It includes a gate, compressor/limiter with sidechain and five bands of 48-bit "double precision" parametric equalization.

The company says Ultra-Channel offers users a more comprehensive strip, as it features a gate, de-esser, Omnipressor compressor/limiter with sidechain, five bands of 48-bit double precision parametric equalization, stereo delays and the Harmonizer micropitch shifter. The signal path also is configurable.

EQ65 Filter Set recreates the sound and function of the vintage analog filter set, which is suitable for fixing problematic tracks. Included in EQ65 are high- and low-cut 18 dB/octave filters, and two-band reject or band-pass filters with variable depth.

Equalizing capabilities are expanded with EQ45 Parametric Equalizer, a replica of the vintage analog parametric equalizer. EQ45 includes high- and low-cut 12



Eventide Anthology II E-Channel Plug-in

dB/octave filters, plus four full bands of EQ with continuously variable bandwidth, frequency, boost and cut.

The Precision Time Align plug-in eases mic phase alignment, and is suitable for bringing overhead mics and room mics into phase alignment.

Quadravox offers a higher instance count than Octavox, one of the nine plug-ins in the original Anthology bundle; and features four voices of diatonic Harmonizer pitch shifting. Each voice has an individual delay adjustment and pan controls, so users have greater precision when crafting an effect.

The Anthology II bundle also features the nine plug-ins from the original bundle, including H910, H949, Instant Phaser, Instant Flanger, Omnipressor, Octavox, Eventide Reverb, H3000 Band Delays and H3000 Factory. It retails for \$1,195.

For more information, contact Eventide in New Jersey at (201) 641-1200 or visit [www.eventide.com](http://www.eventide.com).

## TECH UPDATES

## TC Electronic P2 Controls Loudness In Real Time

The TC Electronic P2 Level Pilot is a digital broadcast processor with a real-time loudness controller, multiband processor and limiter. The company says it features one-key operation while keeping presets and parameters available for a system installer or the station's audio engineer. Units can be cloned, facilitating maintenance of a large studio complex.

Up to eight presets can be recalled using the GPI. A PC can be used to adjust parameters using the included Icon program for presetting and remote control.

P2 comes with various international standard presets to be used out of the box or as starting points for further adjustments. Balanced and unbalanced AES/EBU I/O is standard, and TC Electronic says outputs are always active. Sample rate conversion



can be invoked when using digital inputs.

Analog I/O is standard and outputs also are active. The 24-bit converters are scaled in the analog domain, with scaling under preset control, for optimum noise and headroom under operating conditions. The P2 retails for \$3,495.

For more information, contact TC Electronic in California at (818) 665-4900 or visit [www.tcelectronic.com](http://www.tcelectronic.com).

## SRS Labs' Circle Surround Plug-In Enables Mobile 5.1

Circle Surround TDM Pro 2.0 from SRS Labs is an expanded plug-in that lets mixers encode surround music in a 5.1 composite L/R without leaving Pro Tools. Circle Surround-encoded content can be delivered over a two-channel carrier, such as HD and FM radio, and AAC and MP3 files for download or streaming. Additionally, SRS Mobile HD provides mobile listeners with surround.

The SRS Circle Surround TDM encoder plug-in features up to seven-channel input, two-channel output; and 44.1 kHz, 48 kHz and 96 kHz sampling rates are supported. It accepts project stems in LCR, LCRS, 5.0, 5.1, 6.0 and 6.1. There is a selectable high-pass filter on the main channels, and a complimentary low-pass filter on LFE channel.

The encoder plug-in provides bass management control; it is compatible with stereo compression codecs supporting bit rates as low as 32 kbps, and audio performance at 192 kbps and above. SRS says its surround positional bias generator ensures rear-channel separation when decoded.

The SRS Circle Surround TDM decoder plug-in offers two-channel input, seven-channel output; it also supports 44.1 kHz, 48 kHz and 96 kHz sampling rates. The company says the Xtract mode is suitable for repurposing legacy mono and stereo content as 5.1 or 6.1. The decoder plug-in also includes the SRS TruBass bass extension processor, and the SRS Dialog Clarity enhancement processor.

Dialog Clarity lets the mixer lift the vocals or dialog out of the mix; TruBass allows the mixer to extend the bass imaging.

For more information, including pricing, contact SRS Labs in California at (800) 243-2733 or visit [www.srslabs.com](http://www.srslabs.com).



## Wheatstone Debuts 31-Band AP-1000

Wheatstone added the AP-1000 digital spectral processor to its Vorsis line of digital audio signal processors. It is a 31-band processor that occupies three rack spaces and is equipped with AES digital and analog inputs and outputs.

The 31-band processor/limiter is at the center of the unit, with individual thresholds, clipping and filters for each band. Wheatstone says the AP-1000 can work on a subcritical band level with the intended high-definition encoders because it operates with such narrow-band filters. The multiband compressor stage is followed by a split signal path that provides separate four-band parametric EQ and final limiting for the HD and FM paths. The FM path has a delay for HD correlation.

Also included are a three-band AGC, stereo generator, SCA inputs, switchable pre-emphasis and a low latency monitor output.

Signal activity is shown via spectrum analysis graphs on a front-panel Fast-Fourier Transform flat-panel display, as well as on the matching PC software graphic interface. Nine 40-segment LED light column FSD meters monitor input level and expansion, and FM and HD output. The panel also has an Ethernet I/O connection, a headphone output jack and a USB mouse port.

Hardware control options include a front-panel trackpad in addition to the mouse port. Remote monitoring and Ethernet control is accomplished using PC graphical user interface software. Quicksave, preset menu and security buttons allow settings to be stored and recalled as password-protected presets.

The AP-1000 retails for \$13,000.

For more information, contact Wheatstone in North Carolina at (252) 638-7000 or visit [www.vorsis.com](http://www.vorsis.com).



## UAX220-Mic Interface Offers Two Preamps

The UAX220-Mic from Digigram is a USB Audio interface for broadcast and other applications featuring 2/2 balanced analog mic line inputs and line outputs. It features two mic preamps, and is suitable for use with multiple computers, such as a laptop computer and desktop PC in the newsroom or studio. When connected to a computer's USB port, the UAX220-Mic is operational without a driver or external power supply.

Additional highlights include dedicated headphone output stage with independent level control; Neutrik XLR connectors and headphone jack with lock; and zero-latency direct monitoring. It supports operating systems such as Windows XP, Mac OS X, Linux, DirectSound, Core Audio, ALSA and Virtual PCX management. ASIO management is supported via third-party interface.

For more information, including pricing, contact Digigram in Virginia at (703) 875-9100 or visit [www.digigram.com](http://www.digigram.com).

## Radio Design Labs Has RU-ADL2 Dual-Output Delay

The RU-ADL2 audio delay from Radio Design Labs is a DSP-based dual-output delay for an analog audio source. It accepts one monaural audio input and provides two separate monaural outputs.

The time delay on each output is individually adjustable from 0 to 135 ms. A three-digit LED numeric display on the front panel shows the time delay set for each of the two outputs. A locking pushbutton switch selects the output to be displayed and adjusted.

Time adjustment is made in 1-ms increments using keyboard-style pushbuttons on the front panel. If a button is held, the time will first ramp slowly, then more rapidly permitting easy course and fine adjustment of the time delay. A locking pushbutton permits the user to bypass and return to the DSP time delay section without losing the stored delay values. Time delay values are stored in a non-volatile memory so the RU-ADL2 returns to the correct settings following an interruption of power.

Rear-panel terminals provide remote control of the RU-ADL2, including a Lockout terminal to disable the operation of the front-panel time adjustment buttons. Audio connections are made through XLR connectors or on barrier block terminals provided on the rear panel.

The RU-ADL2 retails for \$538.

For more information, contact Radio Design Labs in Arizona at (928) 778-9678 or visit [www.rdlnet.com](http://www.rdlnet.com).

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## ◆ READER'S FORUM ◆

### Slew-Rate Correction

I enjoyed Steve Lampen's article on speaker wire size in Radio World ("Do You Need Bigger Connectors?," March 29).

Steve, this has been a favorite topic of mine and I have long marveled at the gullibility of some consumers to the marketing hype of the "monster" wire sellers.

However, I would like to point out an error in your article that others may have already mentioned to you. Your definition of slew rate, as I read it, is incorrect. I believe you stated that slew rate is a function of, maybe even equal to,  $Z$  (load) divided by  $Z$  (source).  $ZL/ZS$  is a dimensionless entity that has been historically categorized as "damping factor." "Factor" is the correct term here, as it is dimensionless; i.e., Ohms/Ohms cancels, yielding a dimensionless factor.

Slew rate on the other hand has the dimensions V per second (or V per  $\mu$ S). There is no way, to my knowledge, that V/s can be achieved by dividing Ohm(s) by Ohm(s).

Also, it is true the resistance of the connecting cable between amplifier and speaker degrades the damping factor. However, it has been shown by serious investigators that damping factor is a highly overrated parameter and that a DF of 10 is quite satisfactory, even to the "golden ear," for tight bass control of a speaker's woofer acoustic resonances.

George Woodard  
McKinney, Texas

Steve Lampen replies:

George, I try not to be wrong in print but you are absolutely right. I have confused damping factor with slew rate. You are correct on every detail.

Since when did it become the obligation of broadcasters to play any music at all?

Perhaps we should all switch to news and talk formats and forget about airing any music. It's time to stop giving free airtime to record companies. It's time for them to realize we are doing them a favor by airing the "musical ads" at no charge and, if some stations chose to bill them for it what's the problem? We bill our other advertisers.

Maynard Meyer  
General Manager  
KLQP(FM)  
Madison, Minn.

### Forward Thinking

I read with interest the article by Tom Vernon regarding the Gates Sta-Level and other vintage pieces of radio processing equipment ("Gates Sta-Level Offered Longevity," Feb. 15). The fact is, I see a Gates Sta-Level every time I walk into the main air studio I engineer; and it is still in service. As a matter of fact, we also employ a CBS Labs Audimax and Volumax in the processing chain today.

Of course the CBS units have been recapped and aligned, but with those exceptions, they are totally original. It's amazing to think about the many varieties of music and formats these units have witnessed over all those years.

To me, it is apparent these classic pieces of gear can still compete in this age of ultimate processors. Maybe those designs of so long ago were indeed ahead of their time.

Curtis Cleland  
Chief Engineer  
WIOO Inc.  
Carlisle, Penn.

### The Coming of the 'IBOCalypse'

Kudos to Ed De La Hunt on his keen insight to the potential destruction of the AM band with IBOC ("De La Hunt Troubled by HD Radio," Feb. 1). No kudos to his solution, however. The "marketplace decision" didn't work with AM stereo and it won't work with digital either. Manufacturers didn't want to make radios for the wrong system and so they made few AM stereo radios or none at all, and it will be the same now.

Kahn's system wasn't even a frontrunner in the AM stereo wars, though I admit it was a good one. CAM-D isn't even a digital system as much as it is an enhancement. Perhaps if he used those bits for surround sound instead of frequency extension he might be on to something, but even then, the goal is eventually 100 percent digital and his system doesn't go in that direction.

Kahn's CAM-D system won't keep us from the IBOCalypse, but perhaps his lawsuit will. As much as I want a digital future, IBOC on AM is like cramming 2X pounds of manure into an X-pound bag. Somehow I don't see it happening outside of a new band, or move most of the current stations to the new band and then there will be enough room to do digital on AM.

Scott Todd  
Cambridge, Minn.

### No Free Lunch

With all the controversy brewing around so-called "payola," perhaps it is time for commercial broadcasters to look at a whole new way of doing business when it comes to the music they play.

Each song should be considered a commercial announcement for the record company, the artist and everyone else involved in its creation. With that in mind, each song will be treated like any other commercial aired on the station. Anyone wishing to have a song played will be billed at regular commercial rates based on the length of the song.

It's time to stop  
giving free airtime to  
record companies.

— Maynard Meyer

Because the amount of "commercial songs" aired will be rather large, it may be necessary to set up specialized ad agencies with which the record companies will deal so they don't have to negotiate with thousands of individual stations.

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## INDUSTRY COMMENTS

# Rehr: Radio Not Afraid to Compete

The following is an excerpt from new NAB President/CEO David K. Rehr's address at NAB2006's All Industry Opening session in Las Vegas.

I am delighted to address my first NAB convention. And I am honored to have been selected as your president.

Today, I don't want to relive broadcasting's past glories, mourn its past defeats or wade through a list of issues facing the industry. I want to talk about one thing — and that is where the NAB needs to go in the future.

I believe the NAB must move from an organization that is perceived as being on defense, to one that is on offense. We cannot afford to be an organization that is perceived as protecting the status quo, but rather one that embraces change.

Ladies and gentlemen, my sense is that broadcasting has been defensive in its thinking for too long. We can transform that mentality — and we can start today.

Confidence, not doubt or complaint, should set the tone as we move forward. Certainly we have challenges, but broadcasting has a solid base of strength on which to support the dazzling new possibilities ahead. We should not forget those strengths.

Broadcasting still has the eyeballs and the eardrums.

## Remodeling the future

Satellite radio has supposedly 10 million subscribers total. But 260 million people listened to broadcast radio last week alone. Furthermore, satellite radio lost about a billion dollars last year. Its business model is bankrupt. And this is even before our own digital HD Radio has kicked in.

Our localism, our connection to the

the future is easier said than done. Words are cheap. Technology is expensive. Change is hard. And, yes, there are issues to be resolved: multicast carriage, compensation for content, leveling the playing field with satellite radio. But I know this: the future is always on offense, and those who play defense will be left behind.

Let me give you five areas where we can go on offense immediately.



One: Our future hinges on our ability to exploit every new technology, on every new platform.

Yes, content is still king — but distribution is key. That's why broadcasters must move quickly to increase the number of distribution channels and platforms for our content. Broadcast signals must be everywhere in the culture. Our signals must go everywhere, to everyone, through every device. Our future is a broadcast signal on every gadget — cellphones, laptops, PDAs — and of course multichannels of DTV and digital radio.

As I've been reminding my friends in new media, "TV and radio were wireless before it was cool!" And that coolness quotient is set to explode.

Apple i-Podders can now purchase video programs over the Internet, and

is our full embrace of this future.

Let's face it. Local radio is a basic necessity. New media distribution technologies — and new devices used for communication or entertainment — will need radio. Every electronic device you carry, or are in near proximity to, should have the ability to pick up local radio signals. It's a lifeline, it's a friend, it's the primary media choice of consumers in the

present and for the future.

I believe we will deliver great content to a myriad of devices in the years ahead. And what will be delivered to us in turn is our future.

## Competition means choices

Two: We must promote the benefits of digital television and digital radio.

On the radio side, we must show consumers the exciting possibilities of HD digital radio. Radio is on the verge of its greatest transformation in history. Excitement is in the air.

Seven hundred digital radio stations are bringing their communities improved quality and greater choice. Thousands more are committed to joining this effort. Many stations are rolling out digital multicast or "side channels" of new formats and creative local content.

Our radio companies are undertaking a massive consumer education campaign, shouting the benefits of digital radio to consumers, car manufacturers and advertisers.

NAB itself has undertaken two major advertising campaigns to promote the overall vibrancy of free, over-the-air radio. But now, we must promote HD digital radio — and get more digital radio receivers into the marketplace.

It is our job, and we need to get busy.

Three: We must promote greater competition among cable, satellite and telecom companies. Competition means consumers will have more choices. And it also means we will have more revenue streams from the content we provide.

NAB believes the telephone companies should be able to compete fairly with cable in offering broadcast programming. To be a competitive player, the telephone companies will have to offer local content. Local content is us. And, we will be compensated for that.

Satellite and telephone companies already recognize that they must compensate broadcasters; eventually, so must cable, especially as its own competitive position weakens. Frankly, it is only a matter of time. Broadcast programs are the biggest choice by far of the American viewing audience and compensation for that cannot be ignored or denied.

Another word about competition, this time [about] radio: We are not afraid of

competition to free over-the-air radio.

A new study from Arbitron and Edison Media Research finds that even with the availability of Internet and satellite radio, consumers are not cutting back on time spent listening to local radio.

Radio's history is one of meeting new competition head on and coming out on top. That hasn't changed. To our competitors, I say, "We will beat you!" All we seek is a level playing field.

## Personal responsibility

Four: Rather than being on defense about indecency, NAB is taking a leading role in empowering parents to control what comes into their homes.

We have joined with the cable industry, the movie industry, the TV set manufacturers, the networks and others in an unprecedented \$300 million Ad Council campaign. We intend to reach every home in America. Our purpose is to advance parental use of control mechanisms and the TV ratings system. Unfortunately, most of the attention on decency issues focuses on broadcast TV and radio.

On the radio side, the FCC needs to pay more attention to the obscenity and vulgarity that has found its home on satellite radio.

The vast totality of our broadcast media serves the American people well. And we have no objection to playing by the decency rules. But we have to know what they are. And unfortunately, the FCC's recent indecency fines did little to clarify these rules. We need clearer guidance from the FCC and Congress on where the lines are drawn.

We also cannot forget the importance of the First Amendment in this national debate. Broadcasters feel strongly about free speech, and we will defend it wholeheartedly. But no one should imply that protecting the First Amendment is tantamount to promoting the right to be obscene.

When it comes to the issue of indecency, the NAB is going to play a leading role to maximize one of America's most fundamental axioms — the need for personal responsibility. We will empower people to make good choices based upon their own tastes and values.

Finally, point number five deals with how the NAB works with the FCC and Congress. We are moving away from using the word "lobbyist," which has been defensive and reactive. Instead, we are adopting the word "advocacy," which conveys positive offense in framing the debate, and thus the future. It is only a change in wording, yes, but it reflects a larger change in attitude.

The NAB needs you to be advocates for our industry, not just in Washington, but at home. We intend to step up our grassroots activism of local broadcasters to educate members of Congress, the FCC and their staffs about the realities of our business.

Being an advocate also requires us to be more involved in electing members of Congress who oversee the future of our business. We must have more pro-broadcaster members of Congress. In fact, we must elect more broadcasters to Congress!

It is with this goal in mind that I encourage you to support the NAB Political Action committee. To be successful, we must be financially committed to those legislators who understand and support the value of broadcasting. I hope you will support us in this effort. 

**'[Satellite radio's] business model is bankrupt.**

**And this is even before our own digital**

**HD Radio has kicked in.'**

community, is also an advantage — an irreplaceable advantage. Helping the community is obviously a social good. Helping the community is also broadcasting's business plan and, frankly, it is our brand. We must continue to be evangelical about our community service and about our community content.

Now, upon the solid foundation that we have built, digital TV and digital radio are about to reinvent our industry. We are about to ride a new wave of technology that will take us places we have never been before.

There are breathtaking changes taking place in broadcasting, and across all electronic media. Broadcasters, cable, satellite — and our advertisers — are all part of a personal media revolution. This is the day of consumer convenience and consumer choice. For the first time in the history of media, the consumer is completely in charge.

Broadcasters have tremendous reason to feel excited about this future.

Now, I realize getting to a new model for

watch them on a new class of i-Pods. This is part of our future.

Motorola's iRadio is merging the cell phone, the car radio and the MP3 player, while M-Spot offers streaming music over its phones. This, too, is part of our future.

Verizon is going to pay CBS owned-and-operated stations for the right to carry its signals on Verizon's new home TV service. This is part of our future.

FM adaptors for i-Pods are in the marketplace because listeners want local content and connection. This, too, is part of our future.

Companies with new media devices on the drawing board are taking a much closer look at the value of local radio content.

Every new device is a potential user of our content. And, every new stream of programming is potentially a new source of revenue. We want to be on new devices that haven't even been brought to market yet. Yes, the copyright problems will be worked out. Yes, the technology will be worked out. Yes, the business model will be worked out. What is most immediate and important

## ◆ READER'S FORUM ◆

## License Revoked

I always enjoy the "history" articles by Buc Fitch as I did "The Demise of the First Phone" (March 29).

Buc states something to the effect that a First Phone license was required to operate all broadcast stations prior to 1963. A little research would reveal that this rule applied only to stations having a transmitter power of 10 kilowatts or more, and applied to both AM and FM stations.

On or about 1953 the commission authorized remote control of AM broadcast stations operating with transmitter powers less than 10 kW when operating with a non-directional antenna. These stations, and attended stations operating with these facilities, could be operated by persons holding a Restricted Radio Operator Permit by filling out a simple form and returning it to the FCC District Office.

Those performing maintenance and adjustments on transmitters were required to hold a First Phone License or to be under the supervision of the holder of a First Phone License. There was also a rule requiring the full-time employment of an engineer holding a First Class Phone License. Two-way radio operators of that period also required only a restricted permit. Persons adjusting or maintaining those radios, Land Mobile & Public Safety Services required a Second Class Phone License.

In 1963, the Broadcast Endorsement was added to the Third Class License and the Third Class Phone license with Broadcast Endorsement was made mandatory for operation of AM and FM broadcast stations. The requirement for formal maintenance logs also came into being at that time. These changes were in response to a review of Field Office Inspections and citations, which revealed significant and repeated violations of the rules.

The First Class license was still required for all AM stations with transmitter powers of 10 to 50 kilowatts and for all AM stations operating with directional antenna systems regardless of power. This requirement did not go away until the revision of the rules, which took place in the early 1980s when the operator requirements were dropped.

Keep up the history articles!

J. S. Sellmeyer, P. E.  
McKinney, Texas

When I got out of the Army in 1960 to return to college, I needed a job because

Congress was stalling on passing a GI bill for we who had been called in because of the Russian Sputnik launched in October 1957. An acquaintance told me I could get a job at a radio station if I had a First Phone ticket.

The chief engineer confirmed this, so I crammed for the test. Because I had been teaching electronics at the Ordnance Guided Missile School, it was not difficult to pass.

Immediately I had a job at a station with a four-tower parallelogram DA, and soon a second job at a station with a three-tower dogleg DA. Because both station chiefs were audio guys, I became assistant chief engineer in charge of RF and antennas. This was quite an ego boost.

One station was a DA2 and operated 20 hours a day, so there were five tickets hanging on the wall. After about a month, one of the other guys asked me to look at his broken five-tube superhet. Being naive, I said, "You have a First Phone, you can fix it." However, he replied, "I have an Elkins ticket. I don't know how to fix this stuff."

I was shocked and then learned that this was a cram school where you could learn to pass the test, but nothing else.

This was an unethical moneymaking racket. As an example, suppose a teenage kid wanted more than anything to be a DJ. The station manager would say, "I'd like to help you kid, but you need a license. You can go to any number of schools where you can get one. All that is needed is six weeks time and \$500." So off he goes to beg the money from his parents and then go to school for six weeks.

Stations all over the U.S. had their walls covered by these phony licenses. A rumor said that a certain large broadcasters' organization asked the FCC to look the other way because genuinely qualified people were rare and often required large salaries.

The result was the "combo," a DJ who could run the board and fill in the log during music selections. It was a genuine farce and while I did not appreciate my First Phone being diluted to a GROL, it had to be.

My father acquired a second-class license from the Federal Radio Commission in 1932 and then his First in 1938. I still have these licenses as well as my own. However, it is just as well that this era is in the past. Solid-state equipment just does not require the maintenance as the old tube gear, so let's put it to rest and go onward.

Ron Nott  
Farmington, N.M.

## Stop the Parade

The 109th U.S. Congress has featured a procession of proposals on regulating digital media, some of which could dramatically affect radio broadcasting. Most notable are Senate bill S.2644 — the so-called PERFORM Act — and companion legislation in the House, The Audio Broadcast Flag Licensing Act of 2006.

Together or alone, these would threaten broadcasters' ability to compete in an increasingly challenging marketplace. While we agree musicians and their associates are not always fairly compensated in the digital marketplace, broadcasters certainly aren't the reason. If anything, airplay (terrestrial, Internet or satellite) has the opposite effect, stimulating legitimate sales of recordings and concert tickets.

Yet after releasing unprotected digital content for a quarter-century, the music industry now complains that broadcasters, consumer electronics manufacturers and rogue consumers are conspiring to pick their pockets. They also cite statistics of dubious derivation alleging the impact of digital piracy on sales. Even if these claims were all real, why is it assumed that the industry's sales will always rise? Could it be that the quality of product or its marketing — or changing audience taste — has something to do with downturns, and not just digital piracy? In this country, no business warrants federal protection of its profitability. Doesn't Congress have more important work to do than solve what are essentially business disputes for RIAA members?

Although the bills target satellite and Internet radio (including broadcasters' webcasts), their passage would put *all* forms of audio media on a slippery slope. Their changes to copyright law could soon be applied to digital — if not analog — terrestrial radio, given both formats' capacity for carrying "now playing" metadata (which enables the automated recording that the PERFORM Act would restrict in satellite radio).

The RIAA has said that HD Radio is its next target, which is where the House audio flag legislation comes in. It lays the foundation for a revised consumer audio "ecosystem" in which the music industry envisions increased control of digital content flow.

Even if this were possible, broadcasters should not be penalized for what CE devices and consumers do with content that stations distribute legitimately. Trying to solve this problem by changing license terms is like the police trying to stop speeders by raising gas prices.

Neither broadcasters nor CE makers should have to carry the content industry's water. The burden of these proposals falls on the middle and bottom of the content food chain, while they are benefiting only those at the top. These laws would constrain or inflict new costs on broadcasters, tell CE makers how to build their products and curtail consumers' well-established fair-use rights.

Given the small number of players and their level of business acumen, it shouldn't require legislation to solve these issues, but bilateral negotiations — some of which are underway. Let's drop the rhetoric at City Hall, and allow the industries to resolve these matters in their offices without floating a pageant of unfair or misguided mandates down the street outside.

— RW

## On the List

As radio station owners run panic-stricken over the financial cliff from satellite and other new media, I ask [readers] to look at the latest list of successful stations and seriously tell me the modulation mode makes a difference. I think there's an FM or two in there.

If this list doesn't make the IBOC crowd look like lemmings, nothing will. It's the content of the program, not the method of modulation that makes you a winner. How can anyone think otherwise? Believe it or not, some radio people pay consultants for that very same "information."

Radio's top 10 billers of 2005 are: #1, CBS Radio's KROQ(FM), Los Angeles; #2, CBS Radio's WINS(AM), New York; #3, Clear Channel's KFI(AM), Los Angeles; #4, Clear Channel's WLTW (FM), New York; #5, Emmis Communications' KPWR(FM), Los Angeles; #6, CBS Radio's WCBS(AM), New York; #7, Clear Channel's KIIIS(FM), Los Angeles; #8, CBS Radio's WFAN(AM), New York; #9, Tribune's WGN(AM), Chicago; and #10, CBS Radio's KLSX(FM), Los Angeles.

Larry Tighe  
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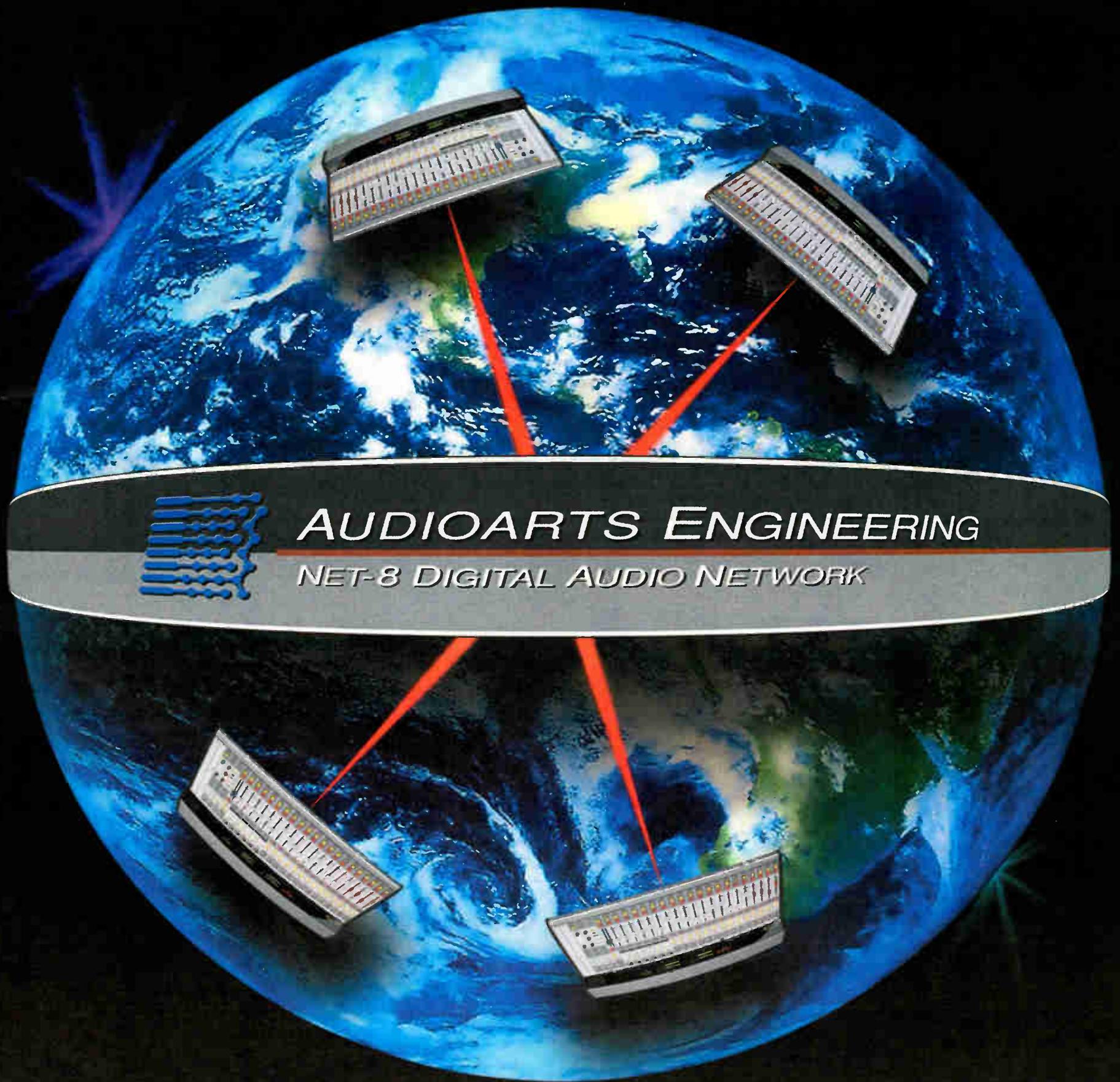
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