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**Special International Issue**  
 We look at digital radio overseas, the BBC's digital transition and satellite radio questions in Canada and Mexico.

**Digital Question Mark**  
 How serious are the problems with the PAC algorithm?

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In This Issue



# Radio World

\$2.50

The Newspaper for Radio Managers and Engineers

June 18, 2003

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### STUDIO SESSIONS

- ▼ We try out M Audio's Studiophile BX8 Studio Reference Monitor.



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## Warning Group Proposes EAS Overhaul

by Randy J. Stine

**WASHINGTON** Is EAS already out of date? Some warning experts believe technology improvements in the electronics and wireless industries have indeed made the Emergency Alert System obsolete. These experts are proposing a new

national strategy for public warnings, to be funded in part by the federal government.

The Partnership for Public Warning released a national warning strategy during its first convention and business meeting in McLean, Va., in May. Members of See WARNINGS, page 6 ▶

## Satellite Radio Sees No Borders

*Mexican Broadcasters Are Troubled by the Penetration — and Possible Future — of Satellite Services*

by Gabriel Sosa Plata

**MONTERREY, Mexico** The launch of satellite radio services in the United States has had unintended consequences south of the border, where some broadcasters in Mexico worry about potential competition from a satellite digital radio service someday.

XM Satellite Radio says anyone who buys its service can use it legally in the United States, a perk for cross-border truckers, for example. But it's easy to obtain service simply by ordering in the United States and taking the receiver back across the border.

It's this kind of use Mexican broadcasters have concerns about. One group has queried the Mexican government about the issue, which some feel could lead to a diplomatic

See XM, page 8 ▶



## PRODUCTION POWER

▼ An engineer in Pennsylvania takes home a Digidesign 001 Pro Tools LE music production system, courtesy of S.C.M.S. and Radio World.

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# FCC Vote Unlikely the Last Word

by Leslie Stimson

**WASHINGTON** Local radio ownership limits were left untouched by the FCC when it revamped media ownership rules this month. But it changed two rules that affect radio, dropping the cross-ownership ban and changing the definition of a radio market.

Yet to be seen is whether the new rules will withstand possible court challenges from companies that want fewer restrictions or consumer groups worried about a few conglomerates controlling much of the nation's news and programming outlets.

Some members of Congress were mulling options for blocking the rules. Sen. Fritz Hollings, D-S.C., ranking minority

member of the Commerce Committee, was one of several lawmakers who had asked FCC Chairman Michael Powell to delay the vote. "It was ignored," he said.

Sen. Byron Dorgan, D-N.D., said, "There's going to be an orgy of mergers." The decision, he said, is not final.

## Now the Hill

Senate Republicans are divided over the decision to raise the TV national audience cap from 35 to 45 percent of U.S. TV households. Ted Stevens, R-Alaska, has introduced a bill to bring it back to 35 percent.

Hollings said lawmakers could take several paths to block the rules. After the FCC vote on June 2, Commerce Committee Sen.

John McCain, R-Ariz., scheduled a hearing with the commissioners to explain the decision.

Not every member of Congress was unhappy. "In large part, the FCC has finally done what both Congress and the courts have asked it to do, and our free speech needs it to do," said House Commerce Committee Chairman Rep. Billy Tauzin, R-La. "The new suit of rules recognize and reflect the explosive growth in the number and variety of media outlets in the market, as well as the significant efficiencies and public interest benefits that can be obtained from common ownership." Tauzin said the rules continue to guard against undue concentra-

tion. Clear Channel Communications expressed displeasure. Company President/COO Mark Mays said the agency chose politics over the public interest.

"Just 10 years ago, nearly 60 percent of the nation's radio stations were operating in the red, cutting news budgets and laying off employees. Deregulation changed all that. But instead of letting radio stations find better and more innovative ways to serve their listeners, the FCC is intent on turning the clock back to a time when the industry was incapable of providing consumers the variety of programming it does today."

The commission also will start to count noncommercial stations towards the total number of stations in a market. The decision recognizes that their audiences have grown and that pubcasters do compete with commercial stations for listeners. Commission staffers also said the agency is no longer factoring in ad revenues as a basis for how many "voices" count in a market.

Joint Sales Agreements will also be counted against an owner; current JSAs that exceed limits will be grandfathered.

The FCC eliminated the outright bans that prevented one company from owning radio and TV stations or broadcast-newspaper combinations in the same market. New rules allow such combos depending on how many stations are in the market:

There is no cross-ownership ban in markets that have nine or more TV stations, assuming the market has at least 45 radio voices.

In markets with four to eight TV stations, one company can own:

- a newspaper, a TV station and up to 50 percent of the radio station limit; or

See OWNERSHIP, page 10 ▶

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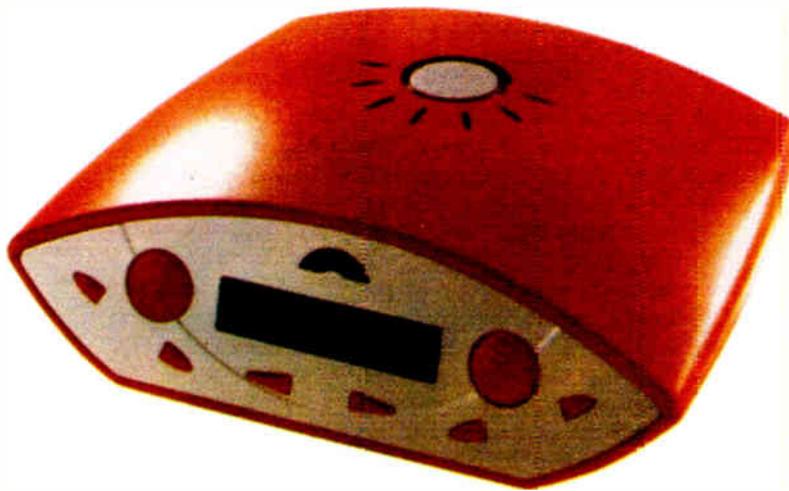
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# Eureka: Niche or Volume Player?

by Leslie Stimson

The terrestrial digital radio standard used in several other countries has slowly attracted more nations since test broadcasts began in 1998. This may be a key year for Eureka-147 as receiver prices start to come down.

Eureka radios have been available since that year as well, but industry watchers say few have sold due to their high prices. Now that more manufacturers are becoming interested in marketing such radios and chipset costs are starting to drop, Eureka proponents hope to have sold 500,000 radios in the United Kingdom by the end of 2003. (Britain and Canada are arguably the best representations of the technology at the moment, since those are the most popu-



The GIO-R101 from ELANSat Technologies in Taiwan is a portable Eureka-147 radio.

sees Mexico and Latin America as strong possibilities.

Digital Radio Mondiale, preparing for 2003 receiver launch for its own shortwave and AM technology, is targeting the same European countries that use Eureka for FM.

## First audience figures

More than 285 million potential listeners around the world can now receive more than 585 DAB channels, according to the World DAB Forum, a non-government consortium of companies that support the implementation of the Eureka-147 standard for terrestrial digital radio. A year ago at this time, potential listenership stood at 230 million and there were about 400 Eureka-147 channels being transmitted.

The BBC turned on the United Kingdom's first digital services eight years ago in tests. Four years ago, Britain saw four new digital stations go on the air.

The first digital radio listening figures reported in May by the Digital Radio Development Bureau, a group dedicated to marketing DAB in the U.K., showed London's privately-owned KISS FM drew 961,000 listeners to its digital broadcasts. The station broadcasts on 20 digital multiplexes.

Local stations Smash Hits reported 759,000 digital listeners and Oneworld reported 50,000 digital listeners.

"Digital radio broadcasting in the U.K. is still in its infancy, and mass-market DAB products have only become readily available in the last few months. These first

See DAB, page 10 ▶

## SPECIAL REPORT

# DRM: Shortwave Wants To Sound Better, Too

by Leslie Stimson

By the end of next year, another type of digital radio receiver is expected to make its debut at the consumer level — Digital Radio Mondiale. It is digital radio for shortwave, medium-wave/AM and long-wave.

Several international broadcasters expected to debut live DRM transmissions this month to coincide with the International Telecommunications Union's World Radiocommunication Conference in Geneva and continue DRM transmissions indefinitely. Some of the broadcasters taking part include Voice of America, DeutschlandRadio, Deutsche Welle, Swedish Radio International, BBC Worldservice, Radio Netherlands, Radio Canada International/CBC and others.

Dr. Don Messer is chief of the spectrum management division of the International Broadcasting Bureau, one of two agencies that oversees U.S. international broadcasters. He said DRM planned to exhibit receivers at the conference with the help of the European Broadcasting Union.

IBB/Voice of America is a U.S. member of DRM, as is the National Association of Shortwave Broadcasters, Harris, Dolby Labs, Continental Electronics, Kintronic Labs, Sangean America and TCI, a Dielectric Co.

At IBC 2002, DRM demo'ed a production-ready world-band consumer receiver made by Coding Technologies together with the BBC and German manufacturer AFG, and a preview version of its first publicly-available receiver, the DRM Software Radio, made by Fraunhofer IIS-A.

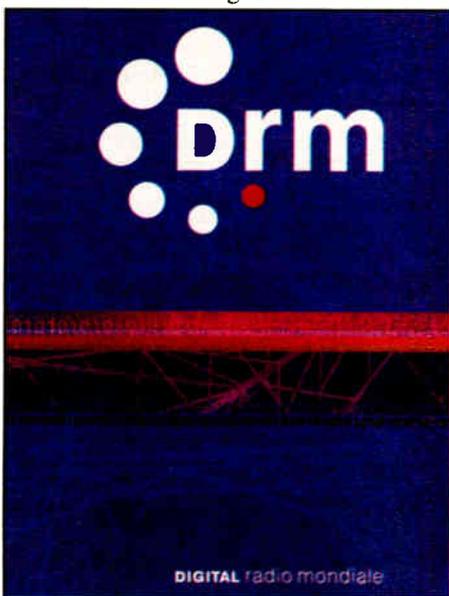
VT Merlin Communications is managing the DRM Software Radio Project. The software radios sell for the equivalent of about \$70. DRM hopes the software radio will encourage enthusiasts such as DXers to tune into experimental broadcasts. DRM has established a Web page devoted to distribution and support of the DRM Software Radio ([www.drmtx.org](http://www.drmtx.org)).

Consumer DRM radios from Sony are expected to be at retailers by the end of 2004.

With some 600 million to 700 million shortwave receivers in use worldwide, improving the audio quality of shortwave

broadcasts was the idea behind DRM, Messer said. Whereas in the United States, one station sends one signal, shortwave broadcasters typically transmit several, hoping one will remain robust and reach its destination.

Long-wave, medium-wave/AM and shortwave are similar in how they have to fight propagation fluctuations compared to FM. For this reason, Messer said, the DRM system has been designed to combat fading and Doppler spread that exists in the long-distance shortwave signals.



Asked if this meant competition with the Eureka-147 DAB technology being used or tested in several European countries and other parts of the world, Messer said no. Eureka requires a much larger bandwidth. DRM is a digital system that uses existing frequencies and bandwidth.

Eureka is also designed so several broadcasters transmit from the same facility at exactly the same power level and coverage area, not practical for most shortwave broadcasters.

DRM began in 1998 as a mostly European-based consortium, and has grown worldwide. Eureka receivers have been on the market since 1998 in some parts of Europe; shortwave broadcasters saw the technology as something that would not be used in the frequencies below 30 MHz.

See DRM, page 5 ▶

lated countries to have the technology.)

About 330 million radios overall are sold worldwide each year, according to Texas Instruments, which makes digital signal processing chips for the Eureka and IBOC technologies. Although most radios sold are analog, the company foresees significant growth over the next 10 years for digital radios for home, car, portable and handheld use.

Ibiquity Digital is not marketing its HD Radio technology to Europe, but it

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# This Is No Time for Secrets

When the National Radio Systems Committee suspended its standard-setting for HD Radio last month, it was an unwelcome delay in the U.S. digital radio rollout. This development also reminds us that the standards process for our industry is far too secretive, and not well-defined.

Important standards should be debated and set in public. Let's get rid of closed-door NRSC discussions and private demonstrations of digital systems made for the benefit of a handful of people.

I'm glad the NRSC's DAB experts were willing to say "stop" when it became apparent that the PAC algorithm was not yet up to snuff. Ibiqity says this is not going to be a lengthy fix, and I hope it's right.

But frankly, this all comes late in the game, with some stations on the air and some receiver plans in place. Why do we find ourselves so far along on the HD Radio rollout with a core piece of the digital radio puzzle not yet firmly in place?

Why didn't the NRSC tell Ibiqity, "Look, you gave us your system to try out with a different algorithm, and that's what we approved. If you want to change coding, we can't go forward without re-testing."

I propose two simple steps that would

help avoid any such problem in the future.

First, the NRSC should state that it will not sign off on *any* radio technology standard until the *actual* production version of that technology passes a statistically valid sampling procedure involving a broad base of consumers, radio engineers, managers and other interested parties, run by a third party. In public.

The Aqua FM Snorkel uses bone conduction, transmitting sound through the teeth and jawbone.



## From the Editor



**Paul J. McLane**

return our trust and allow their peers to take part in radio standards debates in an open forum.

★ ★ ★

Toss one of *these* in your suitcase this summer. It's a snorkel that lets you listen to FM radio stations as you swim, made by Aqua Sphere. Perfect for listening to "Yellow Submarine."

The Aqua FM Snorkel's sound system uses bone conduction, transmitting sound through the teeth and jawbone with a special mouthpiece and no wires or headphones.

The mouthpiece transmits sound by contacting your molars to mouthpiece tabs. The waterproof device takes two AAA batteries; it works at the surface, receiving transmissions through its antenna. Although it retails for \$199, I found it online ranging from \$70 to \$130 from various sources.

Amphicon developed the snorkel and says it plans another system for swim instruction and search and rescue situations, allowing the rescuer to be directed to the victim.

Info: [www.aquasphereusa.com](http://www.aquasphereusa.com).

★ ★ ★

The CGC Communicator newsletter online recently shared a tip about a fun Web camera atop the 150-foot solar tower on Mt. Wilson in California. Visit [www.astro.ucla.edu/~obs/towercam.htm](http://www.astro.ucla.edu/~obs/towercam.htm). Scroll to the bottom of the page and click on the "Best of the Towercam" link.

You'll also find cool links to solar phenomena sites. 

As of this issue, we've given away more than \$10,000 worth in prizes just since January in our New Technology Sweepstakes. You can sign up online at [www.rwonline.com](http://www.rwonline.com) or by sending us a letter.

Our winner is Clyde May, engineer at WCRO(AM) in Johnstown, Pa. His prize comes from the good folks at S.C.M.S. Inc., which represents more than 600 manufacturers and is now in its 28th year in business. (Slogan: "You Know We Know Radio.") It also has an extensive rental fleet and used equipment and service operation; and it has a computer division, Computerworks.

The prize is a Digidesign 001 PCI-based Pro Tools LE music production system with I/O box and PCI card. Working with the user's computer, the Digi 001 includes Pro Tools LE software, providing a recording, processing, mixing and mastering system for budget radio production as well as home studios or multimedia work. Retail value: \$995.



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TECHNOLOGY

# 'We're Not the Maytag Repair Man'

## The FCC Cracks Down on Licensees That Rack Up Patterns of Violations

by Leslie Stimson

FCC Enforcement Bureau Chief David Solomon has made good on the promise he made at the recent NAB convention to focus more on stations with patterns of violations, and to conduct complete follow-ups after notifying stations that their plants are out of compliance.

In late April, the agency reaffirmed a fine of \$39,000 against Maria Salazar, licensee of station KTCM(FM) in Kingman, Kan., for operating a radio station from an unauthorized location; failing to maintain proper tower lighting; failing to install and maintain Emergency Alert System equipment; failing to maintain a main studio; and failing to maintain a public inspection file.

In its order, the agency stated that when it initially found Salazar apparently liable in July of 2002, she did not respond. Enforcement Bureau personnel planned to conduct a follow-up investigation to determine whether the station has come into compliance.

If that is not the case, states the FCC in the order, its staff will "take or recommend further enforcement action as appropriate, including the possibility of initiating a license revocation proceeding."

Salazar had 30 days to pay the fine or explain to the FCC why it should be waived or reduced. Efforts to reach Salazar for this article were unsuccessful.

when responding to a fine notification, that the station has a contract with a company to fix the problem.



FCC Enforcement Chief David Solomon

"We're not the Maytag repair man," Solomon said.

Don't lie to the commission, he advised; stick with the facts. Station personnel should tell the commission why they think the commission's decision is wrong, but using only the strongest arguments — the more details, the better, he said.

Because the FCC is focusing more on RF radiation and other tower violations,

said it intends to fine Infinity station WKRR(FM) in Detroit \$27,500 for indecency. Corbett declined to comment on the case directly because his firm represents Infinity. But speaking generally, he said, the commission is bound by the

First Amendment as well as its indecency/obscenity rules. The decisions the it makes on these issues lead to self-censorship, he said.

Solomon said the agency is sensitive to First Amendment concerns, but that when someone goes over the edge, it's a licensee's responsibility to handle it.

# DRM

▶ Continued from page 3

"They say these lower frequencies are slowly going out of business because the audio quality wasn't up to modern times," said Messer.

Some AM broadcasters agree.

"I think cooperation, the way DRM consortium and its members are developing it, is an efficient way to secure DRM's future success, which is a must for AM radio to survive in a digital media environment," stated Anne Sseruwagi, director of SR International. "DRM will be the solution even for us smaller actors in the international broadcasting scene."

For the launch in Geneva, SR International will broadcast 3.5 hours per week in English to the mid-Atlantic states of the U.S. East Coast, including Boston, New York, Philadelphia, Washington and Baltimore. The SR International broadcasts will be relayed via CBC/Radio Canada International's site in Sackville, Canada.

Officially, there are two International Telecommunication Union-approved digital radio standards for medium-wave/AM: DRM and Ibiqity Digital's system. For its worldwide marketing efforts, Ibiqity is focusing on non-European countries, such as Latin America.

DRM believes the best potential markets for its technology, based on receiver sales and domestic shortwave use, include Germany, Britain and France, followed by China, India, Australia and the countries of the former Soviet Union.

## Telling us you didn't comply with the rule because it's stupid doesn't help.

— David Solomon

At an FCC enforcement panel at NAB2003, Solomon said the commission proposed more than 1,500 broadcast fines last year.

The most common violations, according to the agency, involve tower rules, EAS, the main-studio rule, lack of candor and pirate radio.

Solomon listed some of the excuses broadcasters give to try to get out of being fined:

"I'm too small."

"I'm too big."

"We have a great format."

He said the commission takes into consideration a station's financial situation when levying a fine, but that being small does not by itself absolve a station of responsibility for complying.

Solomon also said licensees are expected to inform the FCC once a problem is fixed. Better yet would be to come into compliance before the FCC inspects the station, he said.

He reminded stations that the FCC is the decision-maker in enforcement cases.

"Telling us you didn't comply with the rule because 'it's stupid' doesn't help," he said. "Or telling us we're stupid or telling us Congress is stupid doesn't work, either."

More helpful is to inform the FCC,

Dennis Corbett, Leventhal Senter & Lerman PLLC, said owners should make sure the tower is registered at the FCC and whether the tower is included in the deal when a station changes hands. The FCC does not automatically know this, he said.

He reminded attendees to make sure their towers are properly lit for nighttime. More towers are being outfitted for high-visibility daytime lighting to cut down on painting costs, he said.

Most of the EAS violations John Burgett, Wiley Rein & Fielding, sees are for stations that either don't have the equipment, or for having equipment that doesn't work. He reminded attendees to have their EAS operational handbooks handy and to train employees to use the equipment.

Panelists also discussed a related enforcement topic. Weight loss ads are drawing the attention of the Federal Trade Commission as it investigates fraud. The FTC has issued a warning to stations to screen their ads, said Michael Berg, Shook Hardy & Bacon LLP.

Which ads should stations avoid? Those that make claims like, "Lose 30 lbs in 30 days" and "Lose weight while you sleep."

Just prior to the convention, the FCC

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Jim Moody, Chief Engineer of MRN, selected StudioHub+ for the vehicle wiring because of its analog and digital compatibility and easy re-wiring ability.



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# Warnings

► Continued from page 1

the PPW want the government to take the lead in designing a network of integrated warning systems using new technology aimed at reaching people who are actually affected by an emergency.

PPW is a public-private group made up of representatives from emergency management, government, broadcast engineering and private business. Members want the duty of coordinating warnings in emergencies assigned to the Department of Homeland Security, which issues the color-coded terrorist threat advisories. Right now, several agencies oversee portions of the EAS, including the FCC, the National Weather Service and the Federal Emergency Management Agency.

According to PPW's report, "States, counties and municipalities have developed disparate alert networks at a cost of hundreds of million of dollars; these networks are not particularly effective, are not interoperable and will be difficult to consolidate." The report asks the president and Congress to adopt a national policy for public warning.

## Two-year lead time

"We will be working over the course of the next month to get this document into the hands of decision-makers," said PPW Executive Director Ken Allen. "We hope the strategy will make it clear that public warning is an issue that needs to be addressed and provide an initial map on how to go about making those improvements."

PPW estimates that a "significantly improved public warning system can be up and running within two years, at a federal outlay of no more than \$15 million annually" with most of the costs to the federal government up front.

A spokesman said the partnership would like to avoid "un-funded federal mandates" for broadcasters to participate.

EAS was developed in 1994 as a tool

for the president of the United States to warn the public about emergency situations. Broadcasters are required to run monthly tests to ensure their EAS equipment is functioning properly to carry a presidential address to the nation. All other broadcaster EAS participation is voluntary.

Critics of EAS claim the warning system will remain insufficient without mandatory participation of broadcasters and improved message delivery methods to reach more people. PPW leaders have said that broadcasters would still play an important role in any new disaster warning system.

**These networks are not particularly effective, are not interoperable and will be difficult to consolidate.**

— PPW

The group believes consumers will pay much of the cost for a new warning system through small increases for products they would normally use or through a desire to buy more specialized devices or services, the report states.

"Right now we have few standards, protocols or procedures for developing and issuing warnings," said Peter Ward, a founding member of the Partnership for Public Warning, who resigned from the board in late May.

"Right now EAS is our main national public warning system and will be for a number of years. However, as we move into digital and satellite broadcasting, EAS reaches less and less people ... it's clearly not (using) the technology we'll see in 10 years from now."

In an effort to develop new standards and protocols for public warning technologies, PPW is participating with the Emergency XML Technical Committee, sponsored by the Organization for the Advancement of Structured Information Standards. OASIS is a not-for-profit global consortium established to identify and develop new standards. The purpose of the committee is to release standards that provide interoperability among emergency management systems, PPW sources said.

New warning delivery methods could include the Internet, cellular phones, personal digital assistants, pagers, telephone

former member of the California Office of Emergency Services.

For example, PPW executives believe new "smart networks" will be possible within several years.

"Smart receivers that provide more privacy will need to be built into consumer devices. Using GPS and other electronic location technologies would allow for location-specific information to be received by those who are at the highest risk," Ward said.

## Too narrow?

Not everyone agrees with PPW's assertion that consumers buying new equipment will defray technology costs.

"Any system that depends on the public buying other forms of media to receive the alerts is doomed to provide service to a smaller percentage of the population," said Bill Croghan, CE for Lotus Broadcasting's Las Vegas cluster and vice chair of Nevada's EAS committee.

Croghan said the beauty of EAS is that the public only needs a radio or TV to receive warnings.

PPW's overriding goal is to develop a system that reaches people at risk at any location at any hour.

"EAS interrupts programming for all people. In the future there are likely to be ways to interrupt programming only for those at risk by decoding a hidden signal in digital audio from broadcasters and by other means," Ward said.

Decreased funding and the failure to develop state and local EAS plans are the major reason EAS has increasing inconsistencies, PPW's report states. Most EAS experts who spoke to Radio World agree that little has been done to improve the infrastructure of the current public warning system since the attacks on Washington and New York on Sept. 11, 2001.

Botterell, a former member of the PPW board of trustees, said, "We've instituted some new alert codes, most notably for AMBER. But I'm not aware of any broad improvements. EAS was designed with the overriding mission of allowing the president to address the nation in case of nuclear attack. There may not be any tactical warning with today's potential for terrorist activity."

EAS experts concur that the importance of disseminating disaster warnings quickly and efficiently has increased along with the threat of biological and chemical terrorism in the United States.

Mark Manuelian, chair of the EAS Primary Entry Point Advisory Committee, said there has been discussion by EAS experts to the appropriateness of using EAS to warn of terrorist attacks.

"There is understandable concern about panic resulting from sending an EAS alert to millions of people, the overwhelming majority of whom will not be affected," Manuelian said.

EAS was once considered by some primarily to be a weather warning system; and the National Weather Service still issues the vast majority of public warnings. But EAS experts contacted for this article agree that the system has taken on added importance in the wake of Sept. 11.

However, despite the increased visibility, some observers say EAS has suffered from a fundamental shift within the FCC as to how it views the public warning system.

The EAS National Advisory See WARNINGS, page 7 ►

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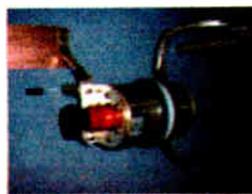
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## EAS Failure in Minot Revisited

Concerns about the Emergency Alert System worked their way into debate at a Senate media ownership hearing this year during testimony centering on consolidation in the broadcast industry.

Sen. Byron Dorgan, D-N.D., asked Clear Channel Communications Chairman/CEO L. Lowry Mays about a train derailment in Minot, N.D., on Jan. 18, 2002, and how KCJB(AM) personnel handled the emergency.

The Canadian Pacific Railway derailment and spill created a hazardous anhydrous ammonia cloud. Local safety officials complained at the time that they were unable to contact local radio stations, owned by Clear Channel, to transmit an emergency alert message.

Clear Channel owns all six commercial radio stations in Minot, including KCJB(AM), the area's primary EAS or

LP-1 station.

Minot Police Administrative Lt. Fred Debowby said several problems with EAS occurred the night of the derailment prohibiting a disaster warning from being issued.

"First, the EAS unit at the police administration building failed. We learned later a power spike from a new generator wiped out the memory of our EAS equipment. Later, when we attempted to reach the night technician at the Clear Channel stations, we couldn't get an answer on the phone," Debowby said.

Even if public safety officials had reached KCJB, he said, it turned out "the station's EAS unit had a bad chip" and wouldn't have worked properly.

In the end, local police officials called the homes of several newspeople from the radio stations. They went to the stations to

get the news on the air, Debowby said.

"Needless to say, the information did not reach the air in a timely fashion, considering we had a cloud of poison gas hovering over (Minot)," he said.

Debowby said the anhydrous ammonia cloud that floated over the city killed one man and sent hundreds more to area hospitals for treatment.

He said the city has since updated its EAS equipment and has the ability to initiate civil emergency messages if necessary.

"KCJB is set up to forward the message to the other Clear Channel stations now."

Allan Brace, regional engineering services manager for Clear Channel, said KCJB had live-assist programming on at the time of the incident.

"It just so happened that the board op was down the hallway when the phone

rang, and he missed the call. To my knowledge, (KCJB's) EAS equipment was functioning properly at the time, and the board op would have been able to activate an alert had he known about it," Brace said.

No EAS alert was ever sent that night, Brace said.

Most of the Minot Clear Channel cluster's overnight programming is satellite-fed or voice-tracked, he said.

During the hearing, Dorgan asked Mays whether it was "troubling when people aren't manning the boards."

Mays replied that the person at the station "didn't understand how to work with EAS," and that subsequently, Clear Channel engineers traveled from Minneapolis to Minot to train station personnel.

—Randy J. Stine

## Warnings

► Continued from page 6

Committee held its last meeting in 2002. The FCC did not renew the group's charter when it expired last year, said Al Kenyon, former NAC chair and senior vice president of projects and technology for Clear Channel Radio.

"In a private meeting with the FCC, I was told that the commission regarded EAS as 'old fashioned' and that they hoped the Media Security and Reliability Council would provide direction for the next generation of EAS," Kenyon said.

Commission staffers say EAS continues to be a priority for the agency.

The FCC established the Media Security and Reliability Council in 2002 consisting of senior broadcast executives particularly interested in keeping radio and TV stations on the air in the event of natural disasters or further terrorist attacks. Members of MSRC are also trying to determine how EAS best fits into emergency planning. Members were to vote by June 18 on several public warning recommendations, including EAS. Final guidelines are expected in December.

"I contend that allowing the NAC charter to expire at that point in time was one of the worst things the FCC could have done. We need to make the best of what's in place and at the same time look forward to new and improved methodologies," Kenyon said.

He is working on recommendations for the next generation of EAS through participation on several MSRC working groups.

"Upon reviewing the MSRC report the commission may take action as they deem appropriate to revise Part 11 of the EAS rules," he said.

However, the MSRC is lacking any significant input from emergency management officials, said Van Schallenberg, emergency manager for the city of Cashion, Okla.

"There are few non-broadcasters represented and no organizations that relate to emergency management. A successor alerting system should incorporate mobile services like radio paging, mobile computing, Personal Communication Services, and the Internet," Schallenberg said. "In this respect the MSRC is too heavily represented by broadcasters." ●

## FreeDom from the Studio!

When Dom Deluise drops in weekly on the Carey Brothers' home improvement radio show, On The House, all three sound like they're broadcasting from the same studio. Listeners have no idea that the Careys are in their state-of-the-art studio while Dom is sitting in the comfort of his home, hundreds of miles apart. Since they use Comrex's high-quality, low-delay, Turbo Codecs on ISDN, they do not have to deal with the awkward pauses created by standard MPEG feeds...particularly with multiple hops.

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# XM

► Continued from page 1  
discussion between the countries.

The possibility that other Mexicans might acquire satellite receivers and receive signals from one of the two satellite companies does not please radio entrepreneurs. They worry that big group broadcasters may strike a deal with either XM or Sirius and broadcast Mexican programs all over the country, potentially undercutting listening for independent stations.

Some Mexican radio broadcasters believe the bilateral satellite digital radio agreement — signed on July 24, 2000, by Mexico and the United States with respect to the use of S-band spectrum — is vulnerable.

## Signal strength?

"We're worried because authorities in this country said at first that the signal was not going to have as much power as the system now appears to have," said Roque Chávez López, director general of the Promored radio network. "They said that it would only reach 30 miles beyond the border, but this has not been the case."

XM Senior Vice President Lon Levin said the agreement has not been violated. Coverage is not specified in the S-band agreement, he said; rather, it includes a measurement of how much energy the satellite directs to the ground.

"The deal is (about) interference,



XM uses Hughes 702 satellites in a geostationary orbit.

not coverage."

The agreement protects Mexico's allocation for satellite radio in case that country wants to launch a similar service, he said.

XM has a similar spectrum coordination agreement with Canada.

The director of Educational Radio, Lidia Camacho, said, "In fact, if we have these kinds of international agreements, they must be respected by law, and I believe this must be unquestionable."

The National Chamber for the Radio and Television Industry, Mexico's version of the NAB, sent a letter of "concern" to the

Secretary of Communication and Transportation concerning the XM transmissions situation but had not received a reply.

Mexican broadcasters said early on that the government estimated satellite digital radio penetration to be between 120 and 180 miles into the country. However, they said, the extension turned out to be greater.

For example, Mexico City, where the XM Radio signal can be heard well, is approximately 700 miles from the border city of Nuevo Laredo, adjacent to the city of Laredo, Texas. This means the major central and northern cities of the country receive the XM signal with almost no problem.

Radio broadcasters contacted for this story say that Mexico was "drawn into" the bilateral agreements signed with the United States, inasmuch as they did not consider the proximity of Puerto Rico as affecting Mexico beyond preliminary estimates. In view of the earth's curvature, in order to reach Puerto Rico, at 18 degrees north latitude, the central and southeastern parts of Mexico would also be covered by the satellite transmissions.

Apparently there are dark areas, like tunnels, uneven landscapes and areas with many buildings where the signal may be interrupted because the antenna must have a clear view of the sky. Because satellite radio hasn't been introduced in Mexico, there are no terrestrial repeaters to fill in the coverage gaps.

## Bilateral agreement

No studies have been conducted on the reception of satellite digital radio in Mexico. Broadcast sources said such studies could not begin until CIRT receives a response to its letter from the government, which then could conduct studies to determine if there was a violation of the agreement. Such discussions would most likely take a diplomatic turn, with the Mexican government suggesting solutions to the FCC, sources said.

Since the CIRT sent its letter, several months have passed and "it is time for us to receive an official response," said Chávez López in May.

The agreement signed by Mexico and the United States establishes that both countries "endeavor" not to offer satellite radio systems beyond their respective borders. But inasmuch as "to endeavor" is not the same as "to prohibit," the chances are other Mexicans will subscribe to the service so long as similar services are not offered in Mexico.

However, Roque Chávez, who was also president of the Consulting Council to the CIRT, is not worried.

"I don't believe a very large percentage of the population is interested," Chávez said. "Other companies have been making these kinds of offers, like cable radio and microwave radio; and we have confirmed that the typical (Mexican) consumer will not pay for audio service."

The radio broadcaster said that given the economic situation in the country, not many Mexicans can afford to invest approximately \$300 in a system, as well as to pay \$10 per month for the service.

What does worry Chávez, whose group controls 14 radio stations, is that one of these days, XM or Sirius may reach an agreement with some of the larger Mexican radio companies, such as Grupo ACIR or Televisa Radio, and use the satellite to broadcast their stations' programming to the country via this broadcasting system.

"That would really affect independent radio broadcasting in the country," Chávez said.

Another scenario that worries Chávez is that the license to operate a satellite radio system might be offered to one Mexican radio

## No Border In the Sky

Some radio experts here say transmissions from XM Satellite Radio can be received in a large area of this country with hardly any difficulty and with exceptional sound quality.

I've confirmed this.

In February, I crossed the border to the United States and bought an XM Satellite radio system from a Best Buy in the city of McAllen, Texas. I returned to Mexico, connected the new radio to my home system, filled out the XM Satellite Radio page on the Internet and became a subscriber. It was that easy.

The system I bought, the Delphi SkyFi, is one of the versions for receiving transmissions at home, though the decoder can also be used in my car as long as I buy a second antenna for the top of my car.

The decoder is a small radio receiver with a liquid crystal screen that displays the radio station you're tuned to, the name of the recording artist and the song being played. It also displays information such as telephone numbers and e-mail addresses of the station or the studio transmitting the program so you can contact them. This decoder must be connected to a sound system in order to hear the programs.

The antenna for use at home and connected to the decoder is only 6 inches wide and 6 inches long. It is like a small box, 2 inches thick, with a flexible base that can be placed near a window. It does not necessarily have to be outside the house; by a window suffices to receive the signal.

The satellites used by XM Satellite Radio are powerful, so much so that I can place my hand in front of the antenna and even close my hand over it, and the signal is not interrupted.

The system has a tuner that allows me to choose among more than 100 audio channels of music and news/talk formats.

*(Editor's note: XM is permitted to market its service in the 50 states, Puerto Rico and the Virgin Islands. Currently, it only markets and handles subscriptions in the 48 contiguous states, a spokesman said. XM can tell where a subscriber is located by the billing address, and the writer used a U.S. billing address on the Internet form.)*

— Gabriel Sosa Plata

group "and it would be converted into a serious national competitor, because that would be like combining 100 licenses into one."

Chávez said that he is not "against the technology, because that would be like being against progress."

"What we want is to have clear knowledge and advance warning of these offers and rules, and we do not want to do things the way they have been done in the past. There are seven families controlling the majority of the media in Mexico, and this kind of information and prompt access to this type of technology is only shared among them," said Chávez.

Mexican broadcast sources said the ownership situation, in which a few families control the bulk of the media, is common to most of Latin America.

Coincidentally, Camacho said these kinds of technological systems, such as XM Satellite Radio, "are very welcome because they enable the evolution of the media. The technology is welcome, but so are new proposals for the radio industry," he stated.

*News Editor/Washington Bureau Chief Leslie Stimson contributed to this article. See related story, page 27.*

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# DAB

► Continued from page 3  
numbers demonstrate that people are prepared to change their listening habits when they are offered something new," stated DRDB Chief Executive, Ian Dickens.

By the end of this year, the digital radio marketing group estimates there will be 500,000 stand-alone digital radios in U.K. homes, rising to 1 million by late 2004.

Eureka receiver sales figures were not available for this article.

Digital radios in the U.K. are dropping in price and more manufacturers are offering digital products. Late last year, some Eureka manufacturers such as Roberts Radio were able to drop prices to about \$165 as chipset costs fell.

Roberts introduced four portable Eureka-147 radios under the Gemini name with prices ranging from about \$215 to \$330. The Gemini 1 offers a "rewind" feature to play audio received and stored in short-term memory from a few minutes earlier.

In addition to Eureka car radios and home tuners, several companies now offer portables, including ELANSat Technologies, Maycom, EXSYIN Corp., Personal Telecom and others.

TEAC plans to offer a Eureka tuner in the U.K. in August for approximately \$365. Morphy Richards plans to launch Eureka products in that country using RadioScape and Texas Instruments technology.

A group of about 10 broadcasters in France want to go digital with Eureka-147 and the government has established a

task force to determine the feasibility.

In Germany, government officials, receiver and car manufacturers and broadcasters planned to meet this month to discuss how to speed the transition. Key are plans by the government to revamp its subsidy program to cover broadcasters' transition costs.

Germany is important because of its market of more than 80 million people, 38 million households and 42 million cars, according to the World DAB Forum. Approximately 70 percent of the population and area are covered, and most of the 16 German states have launched DAB services. There are approximately 150 stations on the air.

Canada has 72 licensed digital stations, in Toronto, Montreal, Vancouver, Windsor and Ottawa. The stations in the first four cities provide service to 10 mil-

lion potential listeners or about 35 percent of the population, according to the World DAB Forum.

In the fall of 2002 RadioShack Canada Ltd. began carrying DAB home and portable radios, PersTel DAB receivers and combination DAB receivers/MP3 players, in markets that can receive a digital signal.

GM Canada has delayed introduction of receivers as standard equipment following a change in management. ●

## Ownership

► Continued from page 2

- a newspaper, and the allowable limit of radio stations but no TV stations; or
- two TV stations and the allowable limit of radio stations but no newspaper.

In markets with three or fewer TV stations, no cross-ownership is permitted among TV, radio and newspapers. A company may seek a waiver if it can show that the TV does not serve the area served by the cross-owned property (the radio or newspaper).

Based on economic studies, the commission found that greater participation by newspapers in radio or TV would benefit the public. To ensure no company can dominate in a market, the agency has adopted a "diversity index" to measure media in a market.

To define radio markets it switched to a geography-based system using Arbitron Radio Metros instead of contour overlaps.

In non-rated markets, a modified contour overlap system would be used while the agency conducts a short-term rulemaking to define unrated markets. Any station whose transmitter site is more than 92 miles from the perimeter of the mutual overlap area would be excluded from the market.

The commission hopes this will eliminate some of the distortions in market size that occurred when a large signal contour that is part of a proposed combo overlapped the contours of distant stations and therefore, those stations were counted in that market.

The definition will make some markets larger and others smaller, said Media Bureau Chief Ken Ferree. In Minot, N.D., for example, there were 45 radio stations in the market; now there will be 10, he said.

Clusters that exceed the limits will be grandfathered, but generally their sale intact won't be allowed unless to small businesses.

The proceeding generated intense interest from broadcast owners, public interest groups and citizens. Powell said before the 3-2 vote the agency had completed "the most exhaustive review undertaken" of the rules that he feels would pass judicial scrutiny. Crafting rules able to withstand judicial review was important, said fellow Republican Commissioner Kevin Martin, as the courts have overturned the last three media ownership rules they're reviewed.

Democratic Commissioners Michael Copps and Jonathan Adelstein dissented, taking up much of the approximately 90-minute meeting time. Adelstein called the rules debate "painful."

Of radio consolidation that occurred after the '96 Telecom Act, Copps said, "This experience should terrify us."

Adelstein and Copps declared the matter not over and urged the public to continue to make its voice heard. By various counts, the commission received 520,000 to 750,000 comments on media ownership.

Powell called the changes modest and said keeping the rules the way they were was not a viable option. He said the commission heard the public's concern about concentration, which introduced a note of "caution" in the deliberations. ●

# Stepping

Many have realized the benefits of going HD Radio with BE, as orders for new equipment and system designs have poured in since last year. Entercom, Clear Channel, Greater Media, Crawford Broadcasting, Beasley Broadcast Group, WJLD-AM (first non-experimental AM station to broadcast HD Radio), and many more have chosen BE to help them prepare for the future—the HD Radio future.

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NEWS ANALYSIS

## Impact of IBOC 'Pause' Disputed

by Leslie Stimson

How long will the "pause" in standards-setting for HD Radio last?

That was one of the big questions being debated after a decision by the leaders of the DAB Subcommittee of the National Radio Systems Committee in May.

The group "temporarily suspended" standards-setting activities for IBOC (RW, June 4, page 1). The engineers want to see improvement in Ibiqity Digital Corp.'s PAC codec on AM at low bit rates, although they praised the Ibiqity system overall.

Ibiqity has an improvement plan for PAC, but executives said they did not want to get specific about when the issues would be resolved.

### Moving forward

Company leaders took pains to dispute a report published elsewhere that declared the HD Radio receiver rollout would be delayed until 2004.

Ibiqity Senior Vice President and co-Chief Operating Officer Jeff Jury said, "We're pushing forward on all fronts. We believe this will be resolved. It will be in the short term."

When asked to comment on a rumor that the PAC problems would be resolved within 60 days, Jury declined.

Some industry observers believe Ibiqity would make personnel changes as a result of the delay. But when asked whether it was planning to make a change either in the PAC team in Warren, N.J., or at the executive level of the company, President/CEO Robert Struble stated that no changes were planned.

Experts differed on how long the standards-setting pause might last.

One RF manufacturer doubted it



WVAQ(FM), Morgantown, W.Va., went HD Radio in May. From Left: Consultant Ed Bukont Jr. and Station Employees Jim Belt, Ralph Messer and Noel Richardson

would last as long as a similar pause in DTV standards process; that one took a year and a half. "We're talking months, not years," he said.

Jury pointed out that Ibiqity introduced its first field-upgradable software this spring and that PAC improvements may be incremental rather than dramatic.

"The input we'll get from the market is going to guide us. We will make a series of upgrades going forward."

Yet several engineers with major radio groups that have invested in Ibiqity say the company has been trying to tweak PAC for some time. They do not think a fix will be quick and said members of the NRSC had been trying to get Ibiqity to focus on the PAC issue.

"The NRSC's hand was forced. They could not proceed and remain legiti-

mate," said one source close to the issue.

Some broadcast engineers who participate in the NRSC are being particularly cautious about their station rollouts in light of the pause.

One such engineer whose company has invested in Ibiqity said he asked his manufacturer to halt shipments of two FM transmitters until the situation is resolved.

"We paid 50 percent and told them they can let them go (to another buyer) if need be, and put that money toward the next ones."

This engineer believes a delayed rollout until 2004 might be beneficial because the industry could make sure HD Radio sounds as good as possible. "The average consumer doesn't know IBOC is

See PAUSE, page 12 ▶

## Stations Continue To Convert

by Leslie Stimson

Stations continue to go on the air and sign licenses to do so with HD Radio technology.

San Francisco's KDFC(FM) began broadcast both an analog and digital signal May 1. The Bonneville classical station had been an Ibiqity test site for digital radio technology.

Bonneville planned to convert its other San Francisco FM stations, KOIT and KKDV, shortly.

Some public radio managers in the 13 seed markets heard demos of AM and FM HD Radio with PAC at several bit rates (96, 64 and 32 kbps) at the Public Radio Conference in May. Most managers contacted by Radio World thought the audio quality was good overall, although some said they did hear "something" on AM at lower bit rates. None of the managers believed this was a "critical" listening demo.

Nicole Sawaya, general manager of KALW(FM) in San Francisco, said, "I think the average person would have noticed an improvement in higher bit rates on FM."

She said KALW's audience tends to be highly observant and critical, to the point that listeners call the station to complain if they believe the equipment used to record audio isn't up to snuff.

Sawaya said her station hasn't decided if it can convert this year.

Earl Johnson, vice president and general manager of noncommercial WABE in Atlanta, says his FM and TV station will

See CONVERSION, page 12 ▶

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# Pause

► Continued from page 11 coming or delayed."

This NRSC member and some others told Radio World they believe Ibiqity cannot make PAC work at the lower bit rates, and that the technology developer should use a newer version of its previous codec, AAC.

They are especially concerned about PAC's performance on AM including the potential to mangle satellite-delivered programming, which many AMs use. Such feeds are already encoded coming into the station, and some engineers fear the audio quality would degrade through re-coding of that material.

"PAC is only passable at 64 kbps and not great," said one engineer, close to the NRSC process.

## Business models

The DAB Subcommittee of the NRSC doesn't believe PAC on AM at 36 kbps is suitable for broadcast and has questions about its performance at intermediate levels below 96 kbps for FM. Sixty-four kilobits per second and below is the bit rate stations would need for their main programming if they want to devote some portion of their spectrum for

ancillary data services.

But several sources said adding a new codec at this stage is not simple and would affect more than the receivers.

Ibiqity presumably wants to recoup its costs incurred with PAC when it merged with Lucent Digital Radio, said several sources.

Yet, "That's their business model, not ours," said one engineer, referring to broadcasters in general. "We don't want Ibiqity to fold, we just want the system to work right."

A chipmaker who is also involved in the NRSC stressed that not all broadcasters on the NRSC are unhappy with PAC's performance on AM. Having heard IBOC using both PAC and AAC codecs, he said, "Audio coding is perceptual. AAC and PAC make different tradeoffs."

He believes Ibiqity can solve the problem quickly. So does fellow chipmaker Philips.

"We have full confidence that Ibiqity will improve the AM quality and will meet the broadcasters' expectations and needs," said Jack Morgan, automotive director for North America for Philips' semiconductors' division. "We will announce the availability of our chip solutions for HD Radio in the next quarter."

Kenwood plans to ship initial HD Radios to retailers in June and ramp up deliveries in August. 🌐

# Conversion

► Continued from page 11

convert to HD Radio and HDTV this year. "I thought the sound quality was great. I could see what the difference was between AM analog and digital AM."

Unlike commercial stations, public radio outlets face a more specific deadline. Money appropriated by Congress in 2002 is ready to be distributed in matching equipment grants by the Corporation for Public Broadcasting.

## We're operating on good faith with Ibiqity. We've heard from Ibiqity this is their number-one priority.

— Andy Bruno, CPB

There's \$3.5 million in grant funding for FM stations. There is an additional \$1 million for AM that will include antenna testing, specifically for directional and diplexed antennas, said CPB consultant and engineer Doug Vernier, who is helping stations apply for the grants.

Of the 50 potential applicants in the 13 Ibiqity seed markets that CPB has identified, three are AM.

CPB Director of Station Advancement Andy Bruno said he hoped to have the required grant application form on CPB's Web site by early June. The form would need to be returned by June 30.

In order to qualify for the digital conversion funding, stations must be CPB-qualified, they must broadcast to a seed market and draw one-tenth of the average radio listening in the market when averaged over two Arbitron surveys.

Stations also must certify that they have matching funds available from non-federal sources.

Undecided was whether the grants would all be for the same amount or different amounts, Bruno said.

The deadline is tied to Ibiqity's deadline for its latest incentive for early adopters, which remains June 30.

When asked why CPB was going ahead with fund distribution despite the standards-setting pause (see main story,

page 11), Bruno said, "We do think the codec thing will be resolved one way or the other. We're operating on good faith with Ibiqity. We've heard from Ibiqity this is their number-one priority."

"We want to be prepared to fund stations when the best product from Ibiqity is available. We have plans in place. We're moving along based on what we know."

Sources close to the issue said CPB must distribute the money now, or it would be difficult to ask Congress for more money for conversion next year.

After the recent Public Radio

Conference, Ibiqity said two additional noncommercial stations had licensed Ibiqity's technology, KUOW(FM) in Seattle and KUSC(FM) in Los Angeles. Fellow southern California pubcasters KCPB(FM) in Thousand Oaks, KFAC(FM) in Santa Barbara and KPSC(FM) in Palm Springs have also signed HD Radio licenses with Ibiqity Digital.

NPR said testing remains on track this summer on KKJZ(FM) in Long Beach, Calif., for its Tomorrow Radio project despite the standards pause.

NPR, Kenwood and Harris are involved in a project to see whether a second audio or a data channel can be carved out of a station's main channel using IBOC. Items of interest to the involved parties: the robustness of the digital signal at a lower bit rate than the main channel and without an analog fallback, and the digital coverage area. 🌐

## Who Owns PAC?

Ibiqity's Perceptual Audio Coder is an audio compression technology used to transmit the best sound possible in a limited bandwidth. Algorithms supporting audio compression are defined as perceptual audio coders and referred to as "codecs," short for "coder-decoder."

Codecs allow a dramatic reduction in the bit rates required for digital representation of audio signals. Perceptual audio coding schemes use the signal masking properties of the human ear in order to reduce the amount of data that is transmitted.

PAC was designed by Bell Labs and Lucent Digital Radio, which also developed it for other uses such as Internet music distribution and programmable music players.

When LDR and USA Digital Radio merged and became Ibiqity in 2000, the entity became the owner of patents for both companies. At that time, shareholders of both had stakes in Ibiqity.

Now, Lucent Technologies is no longer an investor in Ibiqity. But the company that manages Lucent's former venture capital interests is. New Venture Partners LLP is Ibiqity's largest investor, followed by venture capital investors JP Morgan Partners, Grotech Capital Group and Pequot Capital. These four groups were the lead investors in the technology developer's April 2002 financing. Viacom continues to be Ibiqity's largest broadcast shareholder.

Ibiqity has begun licensing PAC for other applications besides HD Radio. Sirius is a PAC customer for its radios, for example.

Ibiqity had used MPEG Advanced Audio Coding as its codec. The patent pool for MPEG AAC includes Fraunhofer, Sony, AT&T and Dolby Labs and others. Ibiqity would need to pay to license AAC again if it switched codecs, sources say.

## Correction

A story in the May 21 issue incorrectly identified the Long Beach, Calif., station conducting the Tomorrow Radio project tests as KJZZ. It should have been KKJZ.



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World Radio History

# Alabama AM Is Early HD-R Adopter

by Tom McGinley

Gary Richardson wanted to be an early adopter of HD Radio. His was the first AM station that used off-the-shelf equipment to add digital HD Radio. Previous HD transmissions on AM stations used prototype evaluation equipment.

WJLD(AM), a 24-hour station classified as a 1 kW Class C in Birmingham, Ala., and broadcasting at 1400 kHz, has been featuring its rhythm and blues offerings in full 15 kHz digital stereo since December 2002.

WJLD is a stand-alone wholly owned by Richardson Broadcasting Corporation of Birmingham, Ala. Richardson is owner, general manager and chief engineer.

He got into ham radio as a teenager and started working in commercial radio in 1977 at age 19. He has undergraduate degrees in electrical engineering technology and mass communications and business, and a masters degree in technical education. He is a SBE Certified Broadcast Engineer. Richardson installed the HD digital equipment himself with a little help from Broadcast Electronics.

## Early adopter

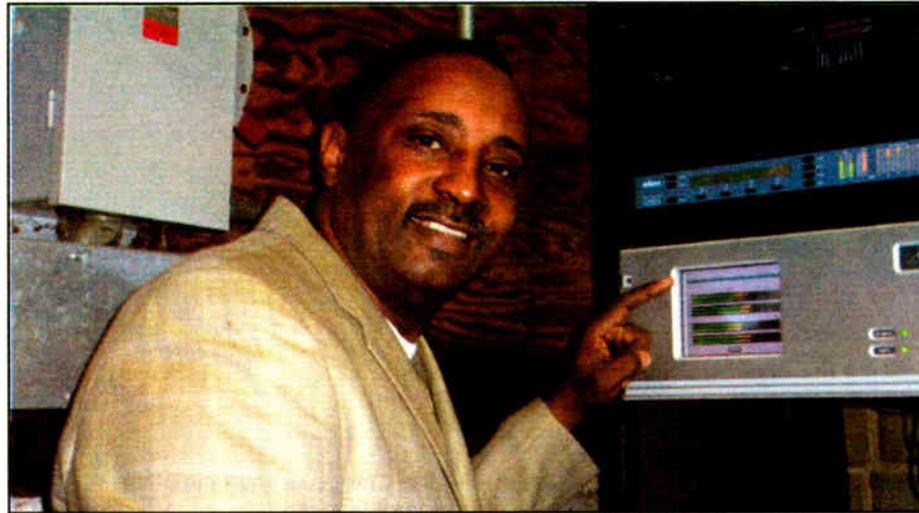
Why did Richardson jump on the HD bandwagon so early, with no receivers available for many months?

"We realized the IBOC technology is the future of radio and early implementation has resulted in substantial savings in licensing fees," said Richardson, who said that WJLD saved approximately \$11,000 by signing up during Ibiquity's 2002 early adopter program and now has a permanent HD license.

It didn't take much to persuade Richardson that HD on AM brings big improvements in quality. "The imple-

tion. However once I heard the digital part of my signal, all doubts were removed. I was truly impressed."

WJLD had previously operated in AM stereo. Now that it broadcasts in analog and in digital, only the digital signal is in stereo. The analog stereo exciter is not compatible with HD Radio and had to be removed.



WJLD(AM) Owner/CE Gary Richardson and His BE AM -1A Transmitter

After contacting BE and BSW to learn the necessary HD Radio equipment conversion costs, he completed an early-adopter licensing agreement with Ibiquity.

"We found our BE AM-1A transmitter only needed \$15 in parts modifications to make it HD-ready."

## Dual processing

Richardson measured the existing non-directional antenna bandwidth characteristics and found it would work well on HD. The rest of the equipment list was completed and ordered.

digital using the Lucid A-to-D converter.

That signal drives the input of the BE ASi-10 exciter, which splits the audio into a full-fidelity digital path and an analog path that is bandwidth limited to 5 kHz. Those signals are looped through the separate Orban and Omnia processing units. The signals return to the ASi-10 where they are

synchronized via the GPS receiver time-base reference. The ASi-10 output delivers combined digital and analog signals directly to the BE AM-1A's exciter input. Richardson used a Tektronics spectrum analyzer and Ibiquity IBOC test receiver to make final adjustments and confirm the digital and analog transmissions were being properly synchronized and held within the NRSC mask for occupied bandwidth. The actual install did not take long. Richardson said installing the equipment was easy; tweaking the processing took longer. BE helped him figure out what

and prices to be able to convert our studio to all-digital by summer 2003," said Richardson.

and prices to be able to convert our studio to all-digital by summer 2003," said Richardson.

His biggest problem with the conversion was getting familiar with all the new equipment, especially the audio processors.

"With our bandwidth limited to 5 kHz, we had to do some tweaking to get a good on-air sound for analog. There was a subtle difference on a dozen or so radios we listened to. However on wide-band radios, we have noticed a hiss from the digital sidebands," he said.

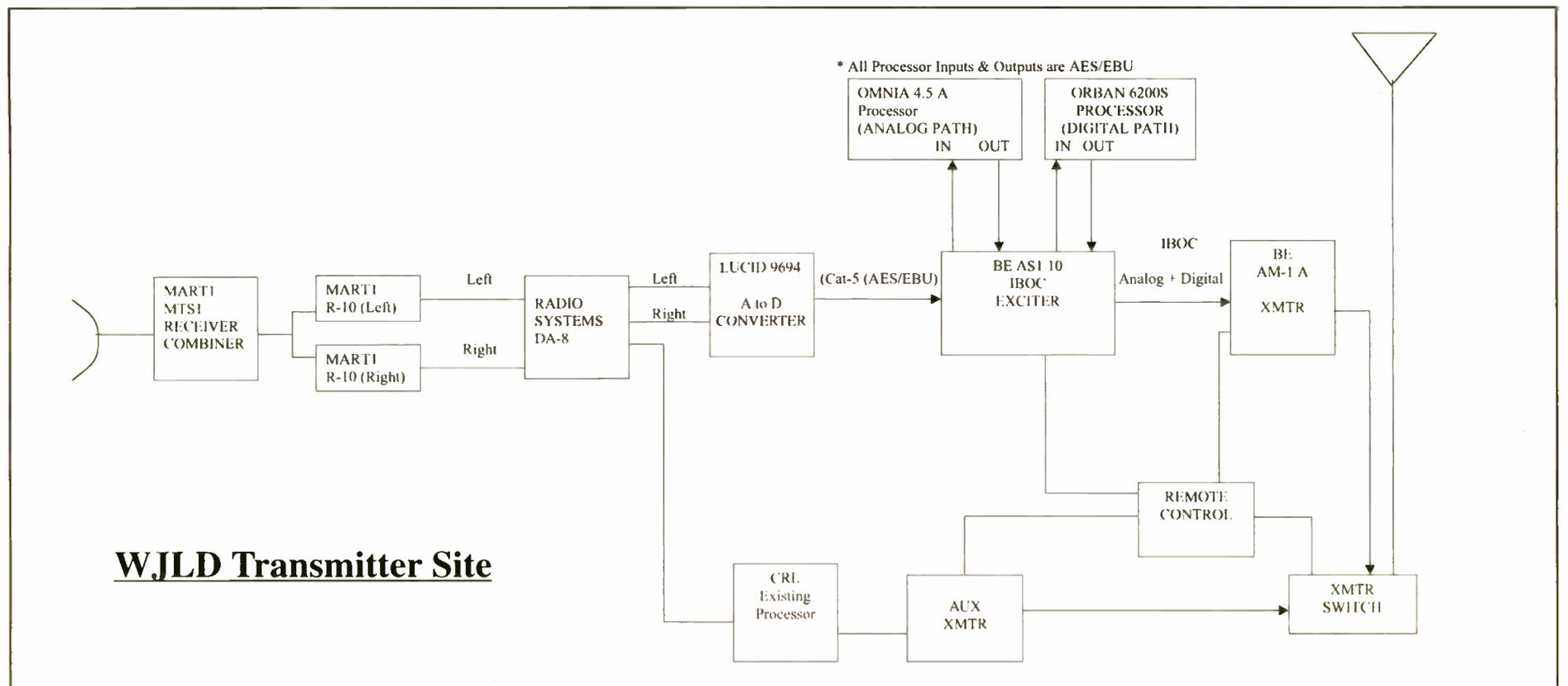
No listeners have complained about hiss or any other interference problem since WJLD turned on digital transmissions, he said. "With most AM radios unable to pick up beyond 4.5 kHz, you will not hear it (a hiss). There was no change in coverage area and we appear to sound louder."

WJLD employees are talking up the new and improved digital sound and telling listeners that consumer digital receivers will soon be arriving in local stores. Facility staffers believe the station sounds better, even on analog receivers. No one in the market, including the station, is listening on HD Radio receivers yet. The station does not yet have its own HD monitor.

"We sent press releases to all major media describing the changes ... and we are changing all our stationery to include the HD logo," said Richardson. "The reaction has been positive and listeners want to know when they will be able to hear the digital signal."

Richardson said WJLD will turn off its analog modulation eventually, "once the marketplace and broadcasters alike adopt IBOC." He is convinced that "those who have been talking against IBOC have obviously not heard the signal."

The owner and CE recognized the service and equipment providers who helped him the most with his IBOC conversion process: Corey Meyer of Audio



mentation of HD radio will level the AM/FM playing field," said Richardson. "Digital radio is immune to the environmental factors that wreak havoc on analog AM. The stereo signal is easily comparable to any of today's FM signals."

WJLD's total investment to get HD on the air was approximately \$35,000.

"I had some reservations before the installation," said Richardson. "It was a substantial cash outlay for a small sta-

The owner and CE purchased a BE ASi-10 IBOC exciter (Serial No. 1), a new Orban Optimod 6200 audio processor for HD and an Omnia 4.5 for analog, a Lucid 9624 A-to-D converter, and a GPS receiver and antenna for the necessary synchronization.

The WJLD audio chain consists of the analog stereo program conveyed via a Marti STL to the transmitter site. The stereo signal is then converted to AES/EBU

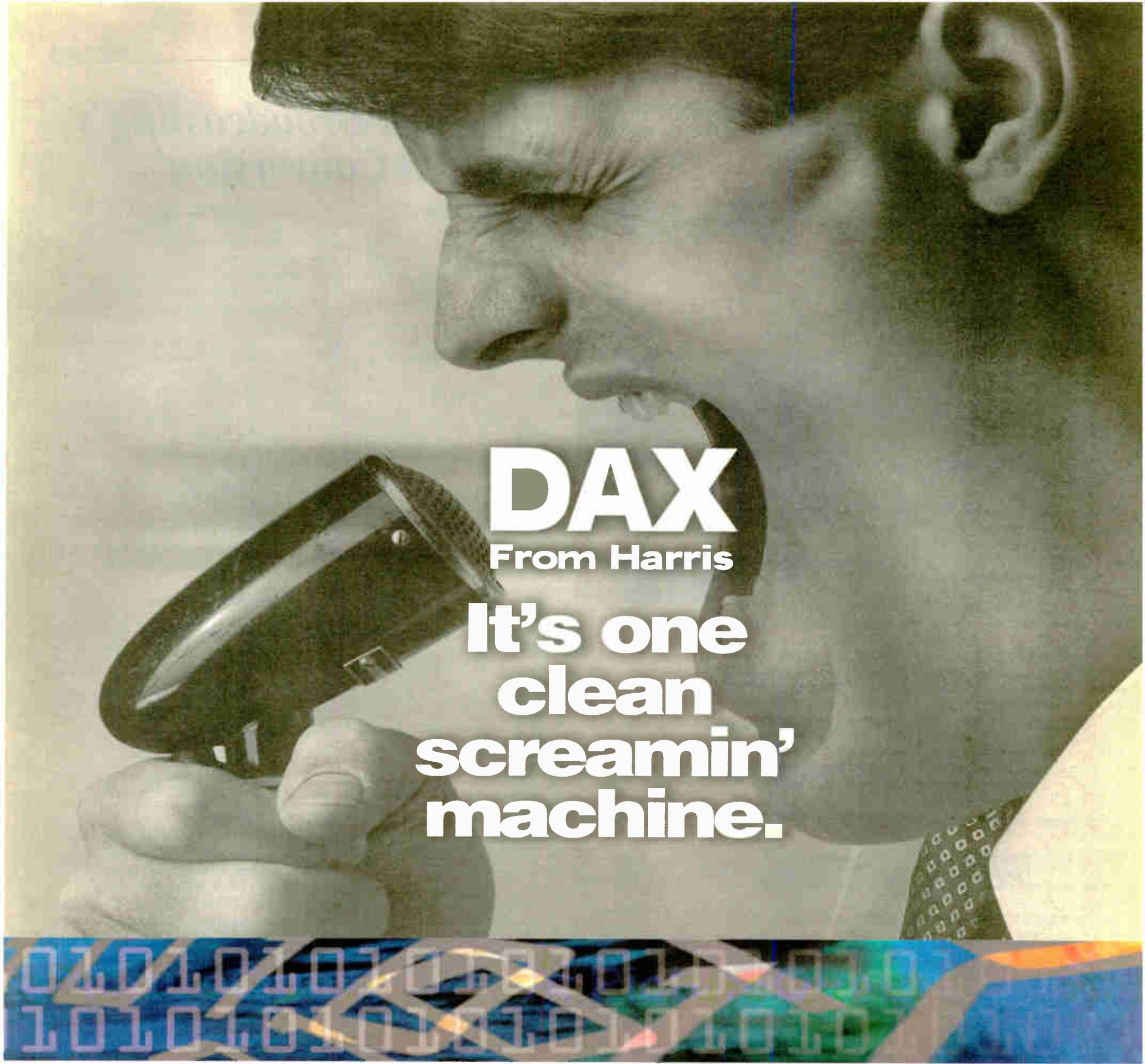
modifications his new model transmitter needed for HD-R and guided him through the set up process. It was mostly all plug-and-play, having to install only the exciter and the HD-R audio processor.

Audio Associates and BSW were the suppliers of the A/D converter and processing gear, respectively.

WJLD still uses an all-analog audio program chain up to the Lucid converter. "We are currently looking at equipment

Media Associates, the engineering staff of Broadcasting Electronics and the sales staff of Broadcast Supply Worldwide.

Thomas R. McGinley, CPBE/CBNT, is technical adviser to Radio World. He is director of engineering for Infinity Broadcasting in Seattle, and past DOE for Communications Investment Corp., the University of Montana School of Radio & TV, First Media Corp. and Cook Inlet Radio L.P.



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GUEST COMMENTARY

## Crawford Broadcasting's 'Limited Conversion'

by W.C. Alexander

*This text first appeared in The Local Oscillator, the newsletter of Crawford Broadcasting Co. Corporate Engineering.*

It seems that a week doesn't go by when some publication comes across my desk or computer screen with a news article or feature about HD Radio, otherwise known as IBOC.

This is nothing new. I can recall a similar blizzard of DAB hype in the early and mid-1990s. In those days, we all felt (and prayed) that a terrestrial digital medium for broadcasters was just around the corner.

When pressed by Mr. Crawford back in 1992 for a prediction, based on all the news of development in the DAB arena, I said that we would have a digital medium deployed in 1994. I missed that one by just a little bit.

Still, efforts have been afoot since 1992 or so. There were displays showing the IBOC FM system in its early stages at the NAB spring shows during those years.

In early 1994, USA Digital, the forerunner of Ibiqity Digital, submitted a pair of systems to the National Radio Systems Committee for testing. How could we not have been on the doorstep of digital then?

### FM push

Perhaps we were closer than we thought, but like the rat in the maze who unknowingly turns back just one turn away from the prize it seeks, the industry sought another route. Competing entrants into the digital arena further muddied the waters.

We were all so afraid of another "AM stereo" debacle, the infamous FCC "let the marketplace decide" action that effectively killed AM stereo as an economically viable medium. Thankfully, the competing IBOC entrants eventually merged, providing the broadcast and receiver industry with the best of all worlds, at least in terms of the system designs that each brought to the table. Now, we are on terrestrial digital's doorstep — sort of.

What we have is an FM system that has been demonstrated to work, but an AM system that has been FCC-approved for daytime use only. My own impressions of the AM system have not been all that favorable, and I concur with the recent NRSC action in halting its standards-setting efforts while Ibiqity works to resolve codec concerns. I assume that Ibiqity can work through these issues, as prior years' demonstrations of the AM system sounded much better to my ear than the current iteration.

For the moment, the big "push" by Ibiqity to saturate the nation's top markets with HD Radio signals focuses mainly on FM.

Ironically, it is FM that stands to gain the least from a digital medium. Properly done, FM analog sounds great. Sure there are multipath, noise and other signal anomalies. For the most part, however, the recovered audio from a well-delivered, conservatively

processed FM analog signal will be on a par with that from a digital medium.

Add in the ambient noise from the mobile listening environment — arguably the place where the lion's share of FM listening takes place — and the noise advantage of digital goes out the window.

Throw in the compromises that are inherent in the Perceptual Audio Coder algorithm and one might well reasonably argue that analog FM sounds better. AM, on the other hand, stands to gain a lot from a digital medium — if the problems with the AM codec can be worked out. Interference, noise and limited bandwidth on the analog signal are all shortcomings that can be overcome with HD Radio.

Based on closed-circuit demonstrations of AM HD Radio that I have heard at previous years' NAB conventions, the possible improvements are huge.

### A year from now ...

Yet here we are with only half an AM system. I understand that nighttime testing of AM HD Radio is underway, but we are likely a year or more away from approval. In my opinion, it is better for our fulltime AM stations to stay strictly analog until nighttime HD operation has been approved.

Otherwise, assuming good HD receiver proliferation, you in effect create a daytime-only station, or at least the perception of such. That is something we would just as soon avoid.

Where will we be with respect to HD Radio a year from now? Two years? I have sworn off making such predictions. One thing I will predict, however, is that we will know more a year from now than we do right now. As we move ever closer to launching HD Radio on our Chicago market station WPWX(FM), we are learning even now.

A year from now we'll have nine or 10 months of HD operation under our belts and will hopefully be much better acquainted with the medium. Hopefully too, HD-compatible radios will be readily available on the shelves of electronics retailers and they will be available as other than top-shelf upgrades in new cars.

Will Crawford Broadcasting Co. dive in headfirst, converting all our stations to HD Radio in the first wave? No, we will not.

What we will do is implement a limited conversion, supporting as best we can the new medium without making a huge, rather risky investment at a time of economic uncertainty and weak consumer confidence. What we will do is our very best, and with the conversions that we do make, we will endeavor to learn all we can so that future conversions can be more effective and economical. And we will hope and pray that within the next year or so, we will have a full HD Radio system available from which all stations, both AM and FM, can benefit full-time.

*Cris Alexander is director of engineering for Crawford Broadcasting; he writes in Radio World about RF issues. RW welcomes other points of view.*

# IEEE 802.11: Whither Wireless?

*Widespread Wi-Fi May Have a Significant Impact on Future Internet Radio Usage*

by Skip Pizzi

For the last few years the common wisdom has held that radio broadcasting would not feel the full impact of the Internet until *broadband wireless* connectivity was widespread, and dedicated appliances were cheaply available (the "boombox with a browser").

Only then would the portability and ubiquity of radio be seriously challenged by online services. This was generally interpreted to mean that the fate of radio rested on so-called "3G wireless" or third-generation cellular deployment, placing much of broadcasters' future in the unsympathetic hands of telecom providers.

**Wi-Fi is morphing from a private, last-meter Ethernet replacement to a public, broadband Internet access system.**

There was a loophole in this scenario, however, that gave many forward-looking broadcasters some comfort: Most 3G service would likely be metered — i.e., charged per minute or fraction of connect time, or perhaps per MB of downloaded material. This argued against its use for random, long-term, radio-style listening. Therefore, broadcast radio would not be threatened (or enhanced, depending on your point of view) by 3G.

Since then, the rosy forecasts of 3G deployment have gone the way of most telecom providers' balance sheets, and deployment plans have been scaled back. So the concern among broadcast forecasters should have abated even further, right? Well, not quite.

While 3G has waned, Wi-Fi has soared. The IEEE 802.11 series of wireless networking standards, as Wi-Fi is officially known, was intended to be used exclusively for personal and enterprise wireless local area networks. It has begun to enjoy the generally unforeseen application of a wide-area, public-service utility type system, however.

Wi-Fi "hot spots" are turning up in hotels, airports and coffee shops, and communities are establishing their own coverage, either by municipally funded operations or, more broadly, by individual contributions of cooperative hot-spots. Some towns are already completely covered throughout their city limits by Wi-Fi service.

While some interference has occurred, the spread-spectrum design of 802.11 mitigates much of this problem, and the addition of new spectrum also helps. Meanwhile, the independent hot-spot approach is giving way to a more federated style in which adjacent operators are organizing and coordinating their spectrum use for greater efficiency, reduced

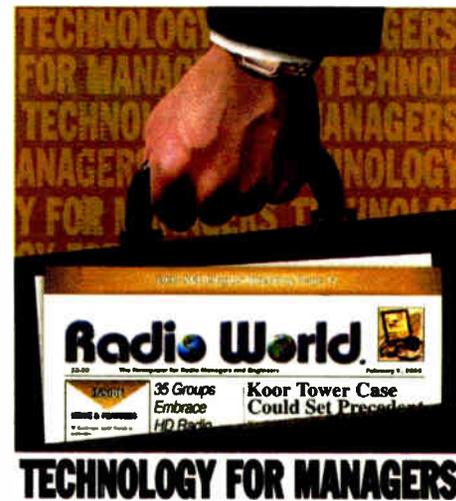
interference and therefore increased throughput. So Wi-Fi is morphing from a purely private, last-meter Ethernet replacement into a public, broadband wireless Internet access system.

Because Wi-Fi is generally not provided under metered conditions, it lends itself well to casual browsing and online media usage. Its broadband nature, its use of cheap, portable hardware and its high reliability also make it quite usable for this application. This implies that the Wi-Fi revolution may have substantial impact

on Internet radio's growth. It therefore behooves broadcasters to learn as much as they can about the technology and its potential.

What we call Wi-Fi today typically uses the IEEE 802.11b standard, which offers 11Mbps of symmetrical bidirectional bandwidth over unlicensed spread spectrum in the 2.4 GHz band.

Transmit power is limited to 30 mW, but with directional antennas and sufficient height, this can offer coverage extending to >100 feet at full bandwidth from a single Wi-Fi access point, or AP. The AP is an inexpensive (~\$150) transceiver that acts as a wireless Ethernet router, and is typically



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connected to an Internet service provider's terminal equipment, such as See WI-FI, page 18 ▶

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## SBE NEWS

# SBE Helps With BAS Data Problems

by David P. Otey, CSTE

The author is SBE national frequency coordination director.

At the recent NAB convention, the Society of Broadcast Engineers held meetings on topics related to Broadcast Auxiliary Services. There was a high level of interest in these topics, largely due to recent FCC actions that are changing the BAS landscape.

Two of the most visible issues have been (1) the recent Report and Order in ET Docket 01-75, making sweeping changes in procedures and technical standards applicable to BAS, and (2) the continuing saga of the reallocation of the first two channels of the 2 GHz microwave band from BAS to new services such as satellite phones and possibly other technologies.

The final chapter is yet to be written in either of these actions; they are still getting attention from groups both within and outside SBE. Because the 2 GHz microwave issue is primarily of interest to the TV side of the industry, the focus here will be on the 01-75 Report and Order and SBE's response.

## Coordination

The scope of this FCC action is so far-reaching that one article can scarcely do it justice. (However, SBE FCC Liaison Committee Chairman Dane Ericksen, P.E., CSRTE, has done an excellent job summarizing it in an article in SBE's March issue of *The Signal*.) Therefore, the information that follows is deliberately limited to the new rules' effects on frequency coordination.

SBE is known for its involvement in coordination of BAS frequencies. Our coordinators help their local broadcasters plan not only "permanent" facilities but also mobile or temporary operations required to cover news and sporting events.

Want to know how the TV or radio RPU (remote pickup) frequencies are shared by all the stations in a market? Ask the local SBE coordinator. Need a new STL (studio-transmitter link) in order to move your studio? Well, that has always been a bit more complicated — you probably have a consulting engineer

helping in this case — but you would still go to your local SBE coordinator to find out what frequencies in the applicable band are already in use, and where.

If you have had any experience coordinating a Part 90 radio or a Part 101 microwave system, you know those services depend on a more formal coordination process. Under the new rules, broadcasters will soon have to follow the same formal coordination process used in the private microwave services. The new procedures will apply not only to the BAS microwave bands from 2.5 GHz on up, but also to the 950 MHz spectrum where most radio station STLs operate.

**Now that we have this reprieve, what do we do with it? The first priority is making sure any new system is up to the task.**

How soon will this happen? That's where SBE's efforts are paying off.

The effective date of the new rules was to be April 16, 2003. Many of our members voiced their concern about the nature of frequency coordination after that date. If local coordination was no longer good enough for the FCC, what would replace it?

Fearing there was no good answer to that question yet, SBE asked for a one-year stay in the implementation of the new requirements, to which the FCC granted a six-month stay. Now we have some breathing room, thanks in large measure to the work of SBE's FCC Liaison Committee.

Now that we have this reprieve, what do we do with it? The first priority is making sure the system the FCC proposes to replace local coordination is actually up to the task.

For about four years, Part 101-style coordination has depended on the Universal Licensing System, a combination database/on-line filing system developed by the FCC. While ULS is an amaz-

ing example of a government agency "getting technology right" in many respects, it is deeply flawed as a tool for BAS frequency coordination for several reasons.

## 'Legacy problems'

For one thing, applications filed on the old Form 313 did not include some of the data ULS now tracks — receive-site coordinates, for example. For another, the migration of BAS license data from its former home in the Media (formerly Mass Media) Bureau to its new residence in the Wireless Telecommunications Bureau (proud parent of ULS) resulted in

some licenses being canceled due to complications of the linkages between auxiliary and parent-station licenses.

These problems were at the heart of SBE's stay request and the commission's reasoning in granting it. "We agree with SBE that legacy database inaccuracies in the ULS could seriously affect the efficacy of prior coordination procedures," said the commission in an order dated April 15. "We will therefore delay for six months the effective date ... (to) provide time for commission staff to address completion and correction of receive site information in the ULS database."

The FCC's next step was to contact SBE and suggest a meeting with them to discuss how we might work together to correct the ULS problems. At an April 29



meeting, SBE asked the commission to set up a mechanism whereby licensees could add missing information to their BAS records without having to file a modification and pay the associated filing fee. As of this writing, that request is pending.

By the time you read this, such a procedure may have been agreed upon. If you have not already seen it in a Public Notice from the FCC, watch the SBE Web site, [www.sbe.org](http://www.sbe.org), for more information.

In the meantime, keep these things in mind:

- Whatever procedure is finally put in place is certain to require electronic, not paper, filing. You should become familiar with the ULS Web site: [www.wireless.fcc.gov/uls](http://www.wireless.fcc.gov/uls).
- To see what BAS licenses are linked to your station license(s), use the Web site [www.fccinfo.com](http://www.fccinfo.com). If any of your BAS licenses do not show up, find your file copies for verification.
- For fixed-link licenses that lack receive-site data, you must find or collect the missing information: site coordinates, elevations, antenna models, etc. If you have any recently issued BAS licenses (easily identified by the green safety paper they are printed on), it might be useful to compare them with the older licenses in your files.

The SBE will continue working with the FCC on this issue as long as it takes to achieve a workable system. ●

## MARKET PLACE

### Delta RF Improves Amp Line

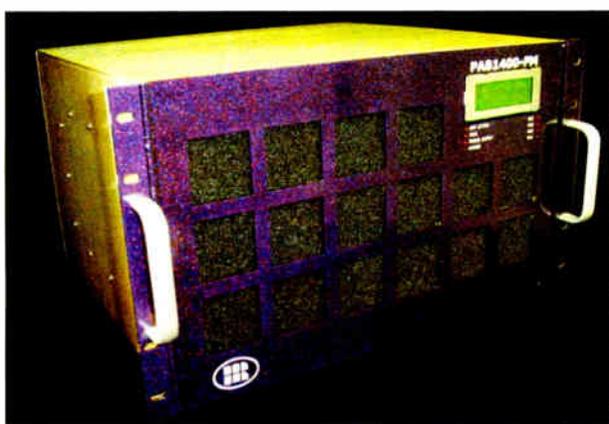
Delta RF Technology has updated its solid-state power amplifier line.

Features of PAB FM Series Class C amps include a new control system and hot swappable modules. The PAB FM series will operate into a 3:1 VSWR load, default to full power in the event of a control failure and remain on the air should ventilation fans or air filter fail.

The products mount in a standard rack 16 inches deep. Control functions are via front panel or RS-232. Quick status indications are provided by LEDs; there is a free module loaner program in place. The PAB FM

series is available for power ranges from 50 to 5,000 watts.

Contact the company in Nevada at (775) 335-8273 or visit [www.drft.com](http://www.drft.com).



## Wi-Fi

► Continued from page 17

a DSL or cable modem, usually via Ethernet on an RJ-45 cable. This allows direct sharing of the ISP connection among all the wireless terminals in the network, which includes any device equipped with a Wi-Fi card or integrated Wi-Fi transceiver, the wireless equivalent of a NIC, a network interface card. Multiple Wi-Fi access points can be interfaced via a router to further extend the range of a wireless network. This is the approach often used in enterprise environments, where a large building or campus operates on a single Wi-Fi network.

Note that the AP approach emulates the client/server Ethernet model, but Wi-Fi also supports a peer-to-peer approach, which it calls an *ad-hoc network*. In this case, a PC acts as the Wi-Fi transceiver and interface to an ISP via Internet-sharing software.

A more recent variant is 802.11a, which is similar to 802.11b but provides up to 54Mbps connectivity in the 5 GHz band. Fewer devices currently operate in this range than in the 2.4 GHz band, so

throughput and operable range is more often optimal in 802.11a (at least for the time being). This networking speed becomes more interesting for digital video connectivity, but even 802.11b offers plenty of bandwidth for audio services. The 802.11g version includes agility between both 802.11a and b systems.

Meanwhile IEEE is developing other families of wireless networking systems under the 802 rubric. The 802.16 standard, called "Wider-Fi," will offer even higher bandwidths, while 802.20 would offer handoffs between hot spots, akin to a cellular phone networks.

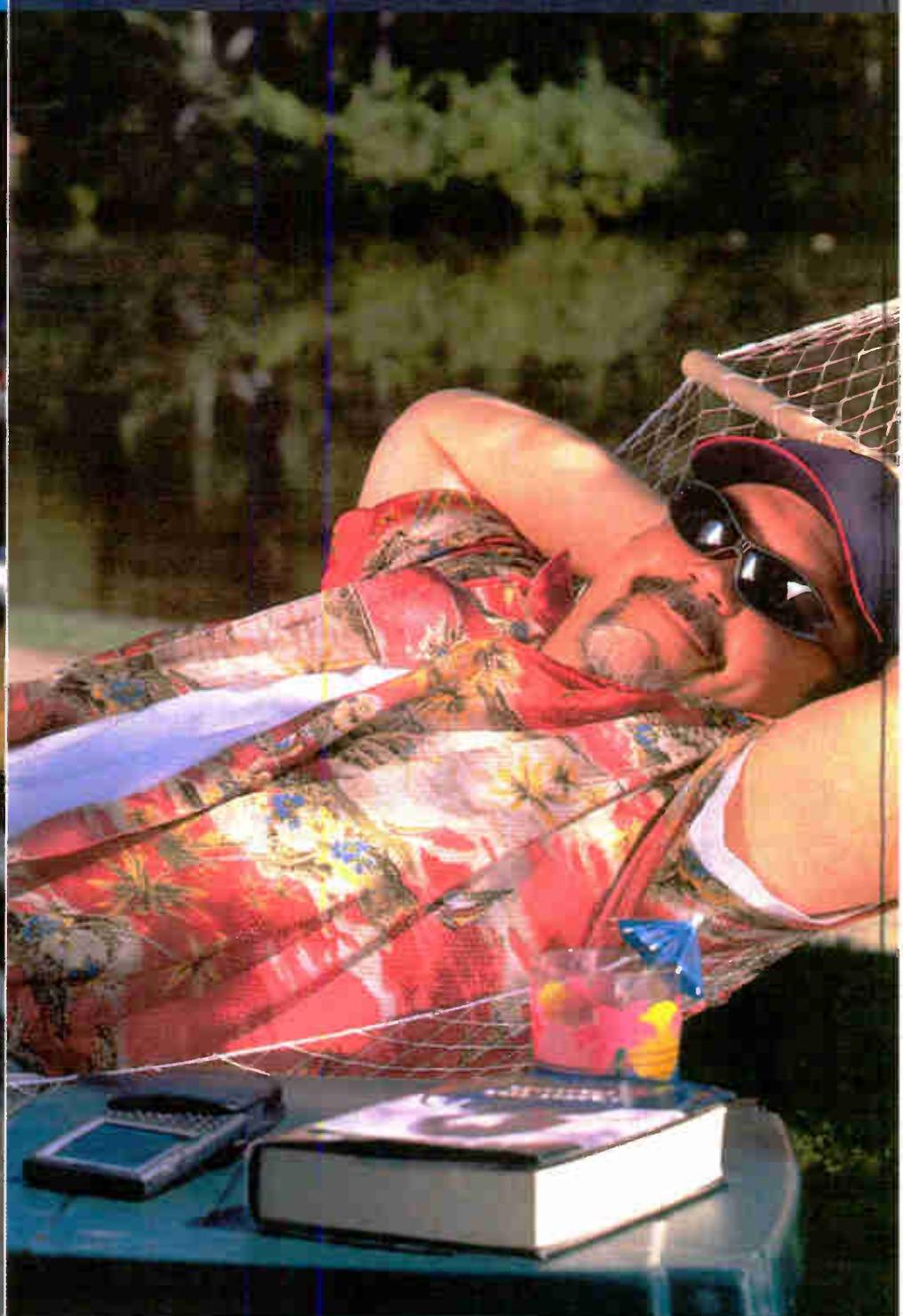
802.11 assumes that networking sessions will occur within a single wireless network, implying its usage for fixed systems only. Nevertheless, a laptop can be moved around within a hotspot without losing connectivity, as many users currently do within their homes or offices. In contrast, 802.20 would allow truly mobile wireless networking.

Although Wi-Fi is riding high at present, it is not a total panacea. The current state of security in the system leaves much to be desired. More about this and other Wi-Fi issues in an upcoming column.

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

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## ROOTS OF RADIO

# Radio History Thrives on the Net

by Ken R.

There is a place where H.V. Kaltenborn still reads the news and the inventions of radio pioneers Edwin Armstrong, Lee de Forest and Reginald A. Fessenden are celebrated.

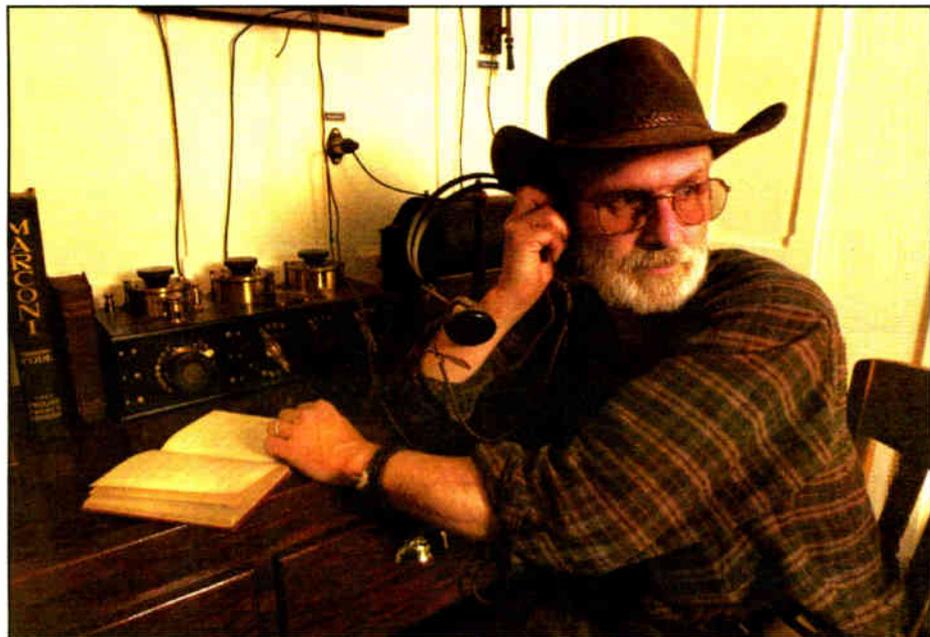
It is the Internet, where all things old are new again. There are dozens of sites devoted to this topic, but we've selected several that capture the passion of the people who still cherish our radio roots.

Jeff Miller, a former broadcaster turned math teacher, developed his main site at <http://members.aol.com/jeff560/jeff.html>. Separate sections are devoted to the history of AM and FM, and a number of entertaining sound files are provided at his [www.fivay.org/sounds](http://www.fivay.org/sounds). If you ever wanted to hear the old ABC, CBS and Mutual radio network logos, this is the place. Miller also created a linked site specific to West Virginia History at <http://members.aol.com/jeff99500>.

"I'm my own Web master and much of the material is airchecks and other material from my own collection," said Miller. "And I recently got an e-mail from a visitor to the site who told me how his father, who died in 2001, had been so happy to see himself mentioned and pictured among the early employees of WJLS(AM) in Beckley, W.Va."

## Dusty archives mined

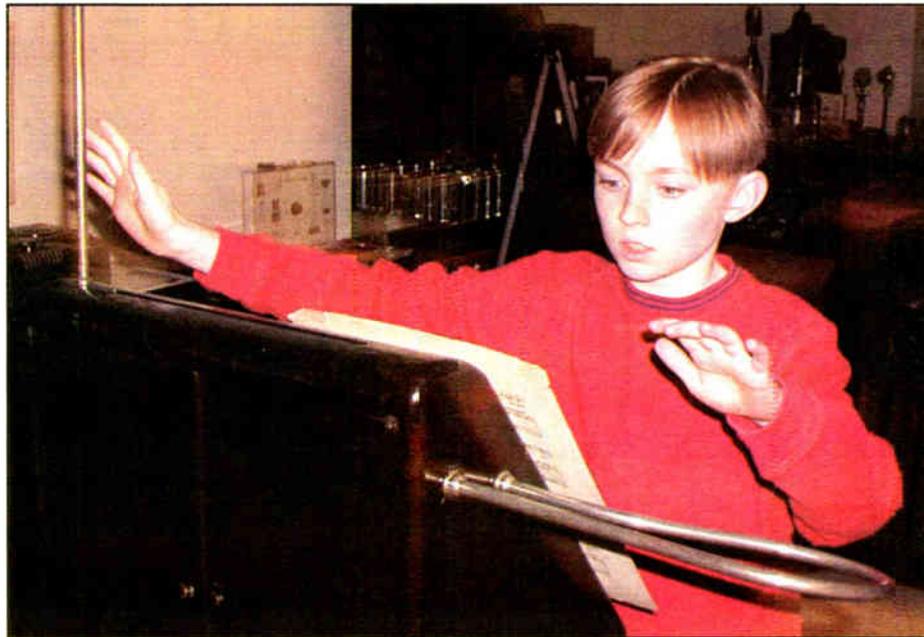
An even more extensive site is at <http://earlyradiohistory.us>. Webmaster and radio historian Thomas White located material at several university repositories and the Library of Congress in Washington. He also sought out documents and photographs from used bookstores and e-Bay.



Jonathan Winter sits in a duplicate of the Titanic's wireless room. The equipment is from the Olympic, its sister ship, and is identical to that which sent the famous SOS.

"I've tried to put together as broad a source of important and interesting documents as possible," said White. "I try to cover interesting areas which haven't been reviewed very much with the hope that people will find them useful."

White avoids narrow "cult of personality" articles and focuses on first-hand contemporary accounts wherever possible. His search yielded a few



A visitor to the American Museum of Radio experiments with a Theremin, the first electronic musical instrument. Five hundred were made by RCA in 1929; the museum has one of the originals.

interesting discoveries.

"I was surprised to find that in 1905 Germany was the first to adopt the S.O.S. distress signal," he said. "And a century ago some people were already talking about personal wireless telephones."

Between the cities of Seattle and Vancouver in Washington is the small community of Bellingham. One of its claims to fame is that it is the home of one of the world's largest collections of antique radios and electric artifacts dating from the years 1680 to 1900.

The Internet site, [www.americanradiomuseum.org](http://www.americanradiomuseum.org), promotes the American Museum of Radio, a non-profit organiza-

tion. Partners Jonathan Winter and John Jenkins retired from lucrative jobs and have spent tens of thousands of dollars of their own money on this project.

"We have 23,000 square feet in a building my partner bought for us," said Winter. "We have combined our collections and hope to establish a low-power FM station too. That would give us reach beyond our own walls here."

Among the treasures to be found are

early static electric accumulators, a vacuum pump from 1880 which led to other discoveries such as the x-ray tube and

## MARKET PLACE

### BE Claims Advance in Synchronous FM

Broadcast Electronics says its digital exciter technology has led to "a breakthrough" in synchronous FM for broadcasters seeking continuous program coverage along highways or within a region under-served by a single FM signal.

Stations precluded from synchronous FM because of unacceptable distortion artifacts in overlap zones are the likely benefactors of the FXi exciter system, the company stated, as are stations with existing systems compromised by distortion in key overlap areas.

BE said it is the first manufacturer to employ a totally digital approach to synchronous FM that provides significantly reduced distortion artifacts in overlap zones.

"Our new digital FXi exciter now makes it possible to synchronize the pilot and the carrier as well as the audio amplitude and frequency of two or more overlapped transmissions, thus reducing the interference issues associated with synchronous FM," according to Richard Hinkle, BE director of RF engineering.

The company argues that other approaches fail to completely synchronize the FM signals, resulting in degraded audio performance in the areas where the transmitted signals overlap and are of equal signal level.

"BE's FXi digital exciter synchronizes the carrier frequency, pilot frequency, audio amplitude and frequency precisely, therefore improving the signal-to-noise

ratio in areas where signals from each transmitter overlap."

It said testing and use of the exciter for several stations in Greece "indicate that program continuity and quality is vastly improved compared to traditional synchronization approaches. This new system design technology reduces the interference zones and noise issues that have plagued other similar systems used for synchronizing more than one FM transmission."

The supplier said its exciter is the only one to employ direct-to-channel modulation, which gives an additional 2 dB signal-to-noise compared to other digital designs that use analog up-conversion, it said. A software feature has been added to synchronize with more precision the amplitude of audio coming from two FXi exciters.

"The FXi exciter takes direct digital inputs, enabling two FXi exciters to be synchronized according to a shared carrier frequency as referenced by GPS. BE's synchronous FM system also uses uncompressed digital STLs to simultaneously feed audio to both transmission systems."

For information contact the company in Illinois at (217) 224-9600 or visit [www.bdcast.com](http://www.bdcast.com).

television picture tubes. The museum owns an 1872 "singing condenser" from Italy.

"It consists of a carbon microphone, an induction coil and a condenser," he said. "The sounds come from the flat condenser made from sheets of tin and paper."

(Winter is depicted in the photo on page 1 of this issue of Radio World. In that photo, he plays with two Geissler tubes from the American Museum of Radio collection. The tubes are lit by a Tesla coil.)

## Titanic exhibit

Another rare exhibit is a duplicate of the radio room from the Titanic.

"It's all original Marconi stuff taken from the Titanic's sister ship," he said. The sister ship was the Olympic.

Winter values his personal collection at over a half million dollars, and his partner's collection will be moved to the museum shortly. The funding comes from local sources with additional help from the city of Bellingham's tourist board.

Ken R. is a former broadcaster with his own antique collection of clothing going back to the 1960s, most of which he still wears.

Tell us about your favorite online radio history site. E-mail to [radioworld@imaspub.com](mailto:radioworld@imaspub.com).



## How's That Ground System?

by John Bisset

Summertime is construction time. If you maintain an AM and the signal seems a little weak, it might be appropriate to inspect your ground system.

Corroded, brittle and broken ground radials, such as those pictured in Fig. 1, may need repair or replacing.

Before retiring, Merrill Pittman was chief engineer for Annapolis Broadcasting's WANN in Maryland.

"Pitt" managed the ground-replacement project for this two-tower directional and shares pictures of the work.

Although the ground radials were in good shape, the ground screen had torn in sections, and radials needed to be re-connected to the base of the tower. This repair was not due to abuse: the site has always been well maintained. Like everything else, things do wear out, even buried ground screen. So often the ground system is simply forgotten because it's buried.

begins with the removal of what's left of the old system.

In some cases, such as WANN's, the radials are fine, but their connection at the base of the tower has been compromised.

### Radial tagging

Replacement of the base screening is straightforward. It begins by identifying the radials that connect to the screen or copper strap/ring. A good way to identify these before removing them (for reconnection to the new screen) is by flagging each radial wire with a piece of white electrical tape.

Once the radials are identified,



Fig. 1: Check the AM ground system for corrosion.

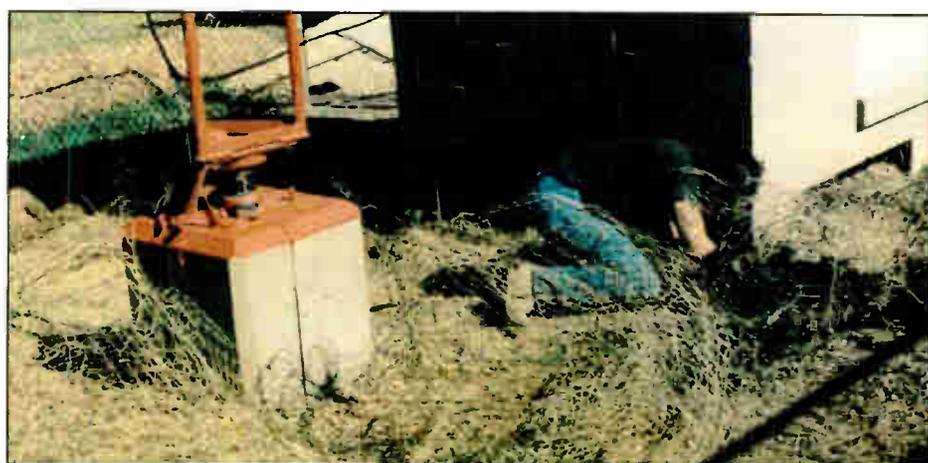


Fig. 2: Once the radials are identified, you can remove the old screen.



Fig. 3: Heavy leather gloves are helpful when piecing together the new ground screen.

The ground screen at the base of the tower may be torn, or perhaps it has disintegrated. A wholesale replacement of the ground system is costly and time-consuming. Whether you're replacing the entire system or just replacing what's under the tower, the project

the old screen can be removed. This process, seen in Fig. 2, means turning the station off, or in the case of multiple tower arrays, switching to another tower. You don't want all that grounded metal around the base

See WORKBENCH, page 22 ▶

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# Workbench

► Continued from page 21 of a "hot" tower.

After removing the old screen, rake the base perimeter clear, add a layer of landscape

leather gloves. The edges of the copper screen are sharp and they will cut your hand easily. In the figure, the



Fig. 4: The completed bonding of two pieces of ground screen is pictured.

fabric to prevent weed growth, overlapping the edges, and cover the fabric with a base of sand.

Usually, your new ground screen has to be pieced together to cover the entire tower perimeter as defined by the license. Using a piece of radial wire and wrapping the ends around the wire is a convenient way to accomplish this.

Fig. 3 demonstrates this method. Note the use of heavy

ungloved hand holds the screen in place, while the gloved hand wraps the diamond-shaped end around the radial wire.

## Solder time

The completed bonding of two pieces of ground screen is shown in Fig. 4. Now it's time to silver solder. Silver solder requires a hot flame. Use MAPP gas or a torch.



Fig. 5: The ground screen can be silver-soldered to the strap.

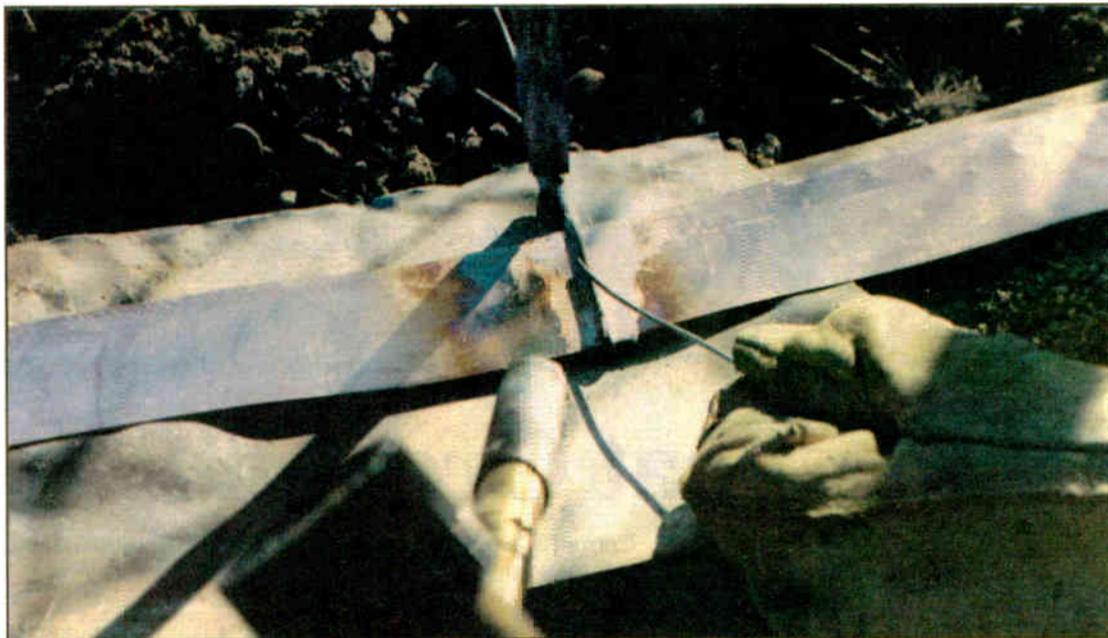


Fig. 6: Each radial can be folded over the strap and silver-soldered to the tower perimeter strap.

Because the metals are new and not corroded, "finishing" them with 3M Scotchbrite, Crocus Cloth or similar product usually is not necessary. Apply silver solder flux liberally. Place a sheet of metal under the edge to be soldered. This will prevent the small pebbles of sand from exploding due to the intense heat of the torch.

dering and keep the sand and dirt from "spitting." The metal used was an old "Danger High Voltage" sign that was replaced with new warning signs and tower registration signs ordered from The Antenna Site Store, [www.antennaD.com](http://www.antennaD.com).

Fig. 7 shows the completed, soldered radial. By the way, copper nails were used to anchor the copper strap to the

301, as "improvement" of the ground system may affect the overall efficiency.

Replacement of an existing ground system with the same components should not require this filing.

## Comparison

Also measure the antenna impedance before and after the work is done. If the measure-



Fig. 7: The completed, soldered radial is shown.

Wear safety goggles, of course, and pay attention to your work. The copper screen will melt if it's exposed to too much heat. Once you get the hang of using silver solder, it will flow nicely, thanks to the flux, and you'll get a good, solid bond.

To keep the sand base intact, it's not a bad idea to use pressure-treated 4x4 landscape ties around the perimeter of the tower. The landscape ties also provide a good base for the copper strap that encircles the base. The ground screen can be silver soldered to the strap, as shown in Fig. 5.

Each radial then can be folded over the strap, as you can see in Fig. 6, and silver-soldered to the tower perimeter strap. Note in the picture the piece of metal discussed earlier to protect the strap and radial wire while sol-

dering and keep the sand and dirt from "spitting."

The project is completed by covering the completed screen with a layer of small pea gravel or round stones. Crushed stone should be avoided, as their sharp edges can cut the new ground screen, undoing your hard work.

The copper strap that passes under the base insulator and down the concrete pier can be tied into the ground screen with another perimeter strap. Bonding this portion of the screen and the strap is identical to the method described above for the outside perimeter strap.

Important: Before repairing a ground system, check the specifications on the station license. Changing a ground system from the specifications of the license requires filing an FCC Form

ment shows a change greater than 2 percent in the antenna resistance component, or if the resistance varies more than 2 percent from the value on the station license, a Form 302 (modification of license) will need to be filed. Technical details can be obtained from your professional engineering consultant and are recommended before embarking on this kind of repair project.

John Bisset has worked as a chief engineer and contract engineer for more than 30 years. He is a district sales manager for Harris Corp. Reach him at (703) 627-0233.

Submissions for this column are encouraged, and qualify for SBE recertification credit. Fax your submission to (703) 323-8044, or send e-mail to [jbisset@harris.com](mailto:jbisset@harris.com).

## FIRST PERSON

# How the Met Cost Me 5 Pounds/Week

by Bill Ryan

As the years go by and the waistline expands, I think back to the winter of 1958 when a decision by one of my bosses at KSL in Salt Lake City cost me up to 5 pounds a week.

The program director decided that we would retain our noon (MST) regional newscast and would delay until 1 p.m. the start of the Saturday CBS Radio broadcast of the Metropolitan Opera.

As I was the only person working those Saturdays, the burden of recording and playing back the Met tapes was mine. The studio engineers, including my friend Wayne Simister, had said that to achieve the highest quality, the program must be recorded on the new ultra-thin Scotch tape at 15 inches per second.

KSL had a very large studio that was once used for live musical and audience participation shows. This studio's control room was located across a hall and about 16 steps below the level of master control, where I was stationed.

**I was to record the opera on state-of-the-art Stancil Hoffman machines, then carry the 15-inch reels upstairs to be rewound and played in master control.**

I was to record the opera broadcast down below on state-of-the-art Stancil Hoffman machines, and carry the 15-inch reels upstairs to be rewound and played back in master control.

I knew the prestigious program, sponsored by Texaco, was an important revenue producer for the station at a time when fewer and fewer network radio shows were sponsored. So I'd better not screw up.

I started the first tape just before noon. At about 30 minutes in, I would place a scrap of paper onto the tape through the spokes of the furiously spinning reel No. 1 and start reel No. 2, doing the same about 30 minutes into it when starting reel No. 3, and so on.

As reel No. 1 began at 1 p.m. on 50,000-watt KSL, the stentorian voice of Milton J. Cross would proclaim the start of another Metropolitan Opera broadcast, "brought to you by Texaco on CBS."

My big challenge was to synchronize the tapes on playback perfectly, whether in the middle of an aria, instrumental music or the opera quiz.

When the paper scrap fell out of the on-air tape, it was time to start its rewind successor. I would listen to it on the console's audition channel and through stop-start, stop-start match it perfectly with the on-air tape, then carefully fade from tape A to tape B.

Meanwhile, I had to keep an eye and ear on the tape being recorded downstairs in the big studio's control room — all this while answering the station's telephones. This went on for three hours.

Through this system, I managed to record and play back each opera during the entire season without a hitch. In fact, it appeared that few listeners were aware the program was recorded.

There were thousands of opera lovers in our audience, and I am sure that any goof would have warranted letters to management.

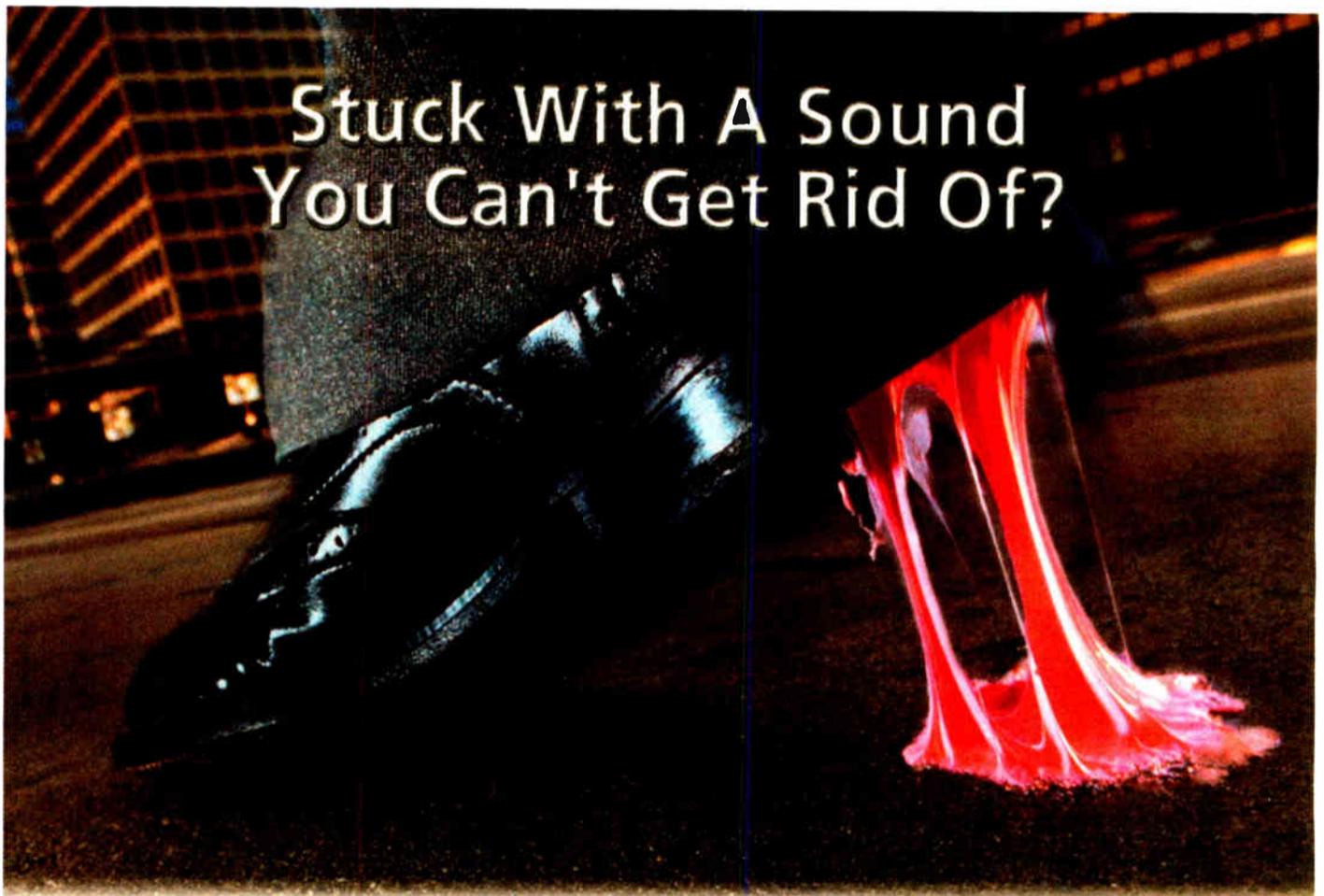
The nervous energy I used in bouncing up and down those bare concrete stairs

and in coordinating those tapes took its toll on me. I would go home drenched and ready for a cool one.

I discovered about midway through the opera season that I weighed up to 5 pounds less on Sunday than I had on Friday. But I always gained it back. Besides, I was just entering my 30s and was strong.

However, I would not recommend this as a weight loss regimen.

Besides, when the opera season was over and summer rolled around, I got to interview the musical acts playing a local amusement park. So I spent those Saturday afternoons with folks like Dave Brubeck, Count Basie and Joe Williams, the Ames Brothers and other stars right there in master control. This joy more than made up for the pain the opera brought me. 



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LX24/BETA58	List 958 <sup>00</sup>	<b>729<sup>00</sup></b>
LX24/87	List 960 <sup>00</sup>	<b>699<sup>00</sup></b>



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### Digital Multitrack Recorder and Condenser Mic



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788	List 1,149 <sup>00</sup>	<b>599<sup>00</sup></b>
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**TASCAM**

We actually do have so many great deals we need a third page, but our boss is so cheap he insisted we just squeeze it in where we could, and this was the only space we had left. But if you have a magnifying glass, you'll find even more to choose from. Hopefully Radio World won't read this ad and bill us extra...

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PMD650PKG	List 1,399 <sup>00</sup>	<b>1,099<sup>00</sup></b>
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### PA System with Bose-Technology Speakers

Truly unique, the Fender Passport PD-250 is a totally self-contained portable sound system complete with 4-channel mixer, speakers, two dynamic mics and all the necessary cables. The deluxe speaker array was co-developed with the Bose Corporation. There are four custom speaker drivers per cabinet in the PD-250. **Features:** 250 watts of pure stereo power at 8 ohms; 4-channel, 8-input mixer; one-touch EQ; digital reverb with remote bypass; two 6.5" full-range LF drivers and two full-range tweeters.

The prize package comes complete with the ST280 stand kit - two black aluminum tripod speaker stands and two mic stands.

PD250	List 1,149 <sup>99</sup>	<b>849<sup>00</sup></b>
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In 1993, we had an idea. We envisioned a way to send CD-quality audio over standard digital phone lines by marrying advanced audio coding and digital telephone technologies. The result: the Telos Zephyr, which transformed broadcasting by making ISDN an easy-to-use, trouble free tool for sending and receiving high-quality audio.

Broadcasters and audio professionals worldwide have since made Zephyr the most successful digital broadcast product ever. Its name has become synonymous with easy, instantaneous point-to-point audio transfer: "Just Zephyr it to me!" And the Zephyr family has grown—from a single model to a complete studio-to-studio and field audio transmission system.

A Zephyr Xstream at your studio becomes a "universal codec." It can connect with every popular ISDN codec for full-duplex, 20kHz stereo audio, transmit and decode streaming MP3 audio over Ethernet, and even connect with the revolutionary Zephyr Xport portable codec via analog (POTS) telephone lines, so you can simplify your life. You won't need a proliferation of codecs in your rack, so you save space, operation hassle, phone lines—and money.

In the field, Zephyr Xstream and Zephyr Xport are powerful remote tools, perfect for on-location broadcasts, news gathering, interviews and remote studio linkups. New MPEG AAC-LD coding lets you transmit Layer 3-quality audio with greatly reduced transmission delay, enabling smooth, natural, high-quality two-way audio. Zephyr models with built-in mixers and Phantom power help reduce equipment inventory and setup time; intuitive operation and simple user interfaces make operation easy even for non-technical personnel.

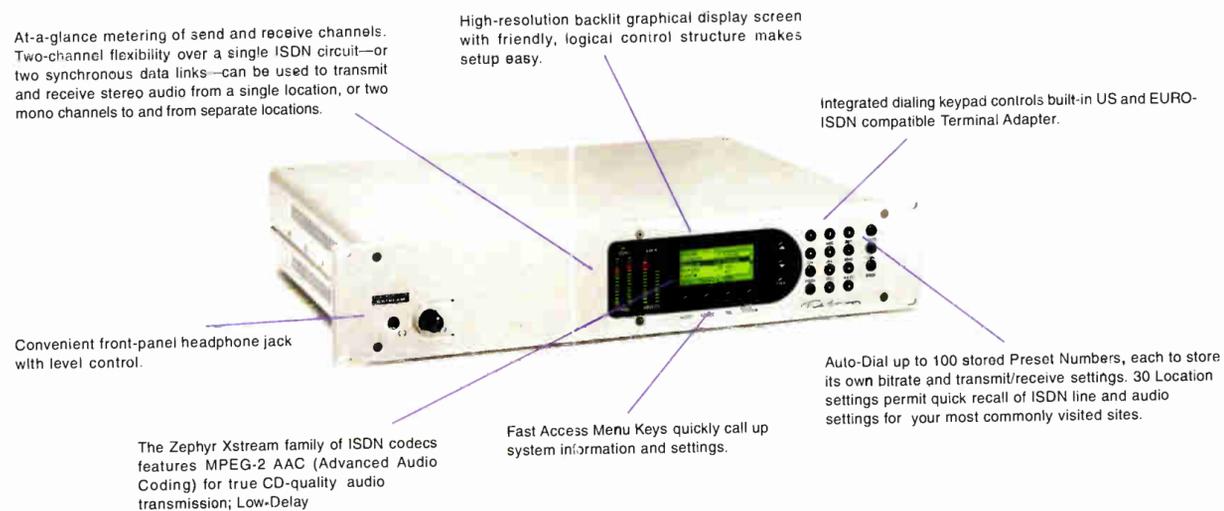
Exclusive new capabilities in the Zephyr Xport now give you unparalleled flexibility for remote broadcasts. Break-through technology developed by Telos lets Zephyr Xport communicate with your studio's ISDN Zephyr Xstream, from a standard POTS line—perfect for remote locations where ISDN is unavailable. Zephyr Xport's reliable digital connection, coupled with aacPlus audio coding, delivers clear, clean audio and rock-solid connections never before possible with a POTS codec. (An ISDN option lets your Zephyr Xport connect over digital phone lines, too.)

Now more than ever, Telos Zephyr is truly The Best Way To Hear From There.

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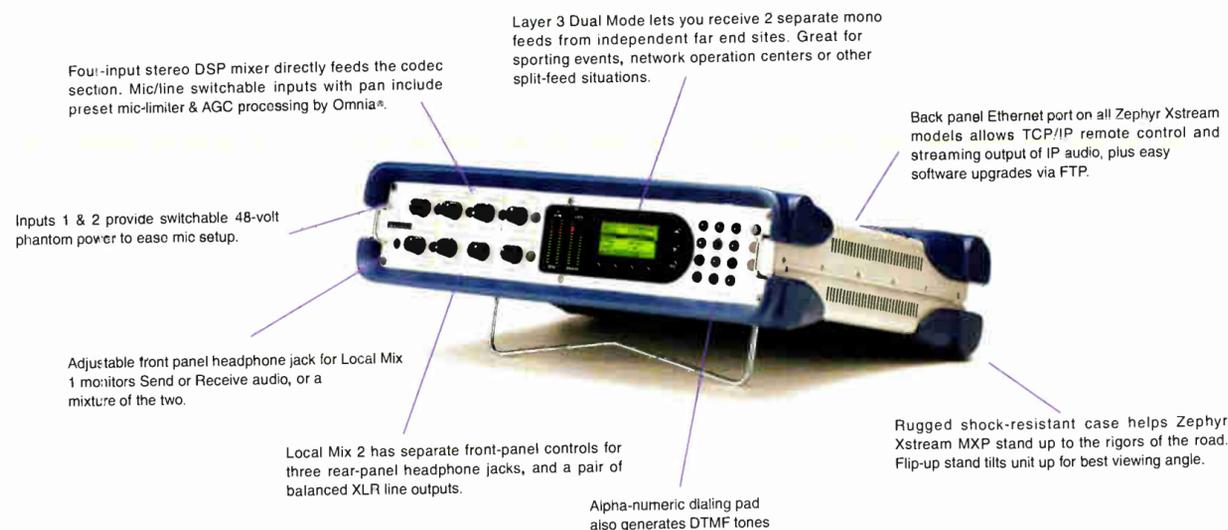
## XSTREAM IN THE STUDIO.

Zephyr Xstream is a full-featured ISDN transceiver with high-fidelity MPEG-2 AAC and low-delay MPEG4 AAC-LD coding, along with standard Layer 3, Layer 2 and G.722. It includes AES/EBU I/O and features full duplex stereo operation of up to 20kHz audio on a single ISDN line; broadcast quality mono audio at 15kHz or 20kHz is possible on a single ISDN "B" channel or other 56/64 kbps channel. Includes built-in ISDN Terminal Adapter for worldwide use. There's also a 10Base-T Ethernet port for remote control and IP audio streaming.



## XSTREAM IN THE FIELD.

The portable Zephyr Xstream MXP has many of the same features as the studio unit, plus a digital four-channel stereo mixer with two local mixes into a road-ready case for on-the-go broadcasting. Zephyr Xstream MX (shown below) offers the flexibility of these mixing and remote-control features in a convenient rackmount package.



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### It seems like everyone I know uses Zephyr. Why is Zephyr so popular?

Ease of use, along with Telos Systems' coupling of MPEG Layer 3 and ISDN, made Zephyr the #1-selling broadcast codec around the world. Zephyr Xstream has won even more acclaim by incorporating MPEG-2 AAC (Advanced Audio Coding) for even greater fidelity with less delay at lower bit-rates.

### Our facilities are IP networked. Can I control Zephyr Xstream over my network?

Yes. A 10Base-T Ethernet port allows remote control using a Web browser over a LAN, WAN or the Internet. TCP/IP connectivity also lets you upgrade system software easily via FTP. Local control options include TCP/IP (Telnet), RS-232, or "panic dial" contact closures.

### Does Zephyr Xstream have a cooling fan?

No. Advanced technology means less heat; no cooling fan means less studio noise.

### Some codecs are very complicated to set up. Is Zephyr Xstream easy to use?

X All Zephyr models are intuitive and user-friendly. The straightforward control panel, graphical menus and on-screen help will have you up and running in minutes. There's even an auto-receive mode that answers inbound calls and automatically determines the correct decoder settings for the incoming audio stream.

### Can I use my Zephyr Xstream with digital connections other than ISDN?

T Yes. An available V.35/X.21 port works with Switched 56 lines, satellite links, and other synchronous data paths. Xstream supports bit rates of up to 384 kbps, making it ideal for STLs, studio-to-studio links and other critical applications.

### Does Zephyr Xstream work with DSL?

R Yes, Zephyr Xstream can send audio over DSL and other IP services via Ethernet, although ISDN and dedicated synchronous data channels are still the most reliable choices due to the variable latency and non-guaranteed delivery inherent in packet-based data transmission. Please see our Technical Paper entitled "DSL vs. ISDN," available on our website at [www.telos-systems.com/techtalk/dsl/](http://www.telos-systems.com/techtalk/dsl/).

### I was told I can connect to an ISDN Zephyr Xstream using a POTS codec. Is this true?

A Using custom modem technology, the Zephyr Xport uses ordinary POTS phone lines in the field to connect to your Zephyr Xstream at the studio. See the Zephyr Xport section later in this brochure for details.

### I've heard lots of "buzz" about MPEG AAC. What is it?

M "AAC" stands for "Advanced Audio Coding." It's the newest high-performance audio coding standard, with approximately 100% more coding power than Layer 2 and 30% more power than the former MPEG performance leader, Layer 3. It was specifically developed to meet the ITU BS.1115 specification that calls for indistinguishable source from output in a 128kbps stereo stream. Using MPEG AAC, Zephyr Xstream can transmit and receive true CD-quality audio over ordinary ISDN lines.

### What's Low-Delay MPEG AAC coding?

Q Zephyr users have known for years that Layer 3 offers all the fidelity needed in most broadcast situations. However, the delay that results from Layer 3 can be un-nerving to talent, particularly if high fidelity is needed in both directions. "Low Delay AAC" or "AAC-LD" for short, offers quality equivalent to Layer 3 with about 75% less delay.

### We do several remote broadcasts each week. Can we store our most frequently dialed numbers?

& A Yes, Zephyr Xstream provides 100 auto-dial locations for your most frequently dialed numbers. There are also 30 Location storage positions that let you store and retrieve ISDN and audio parameters for the remote locations you visit most.

### Can I send digital audio directly from a Zephyr to my studio equipment?

A Yes. The non-mixer version of Zephyr Xstream features AES/EBU digital I/O for connections to digital studio equipment. Sample rates of 32, 44.1 and 48kHz are supported on both input and output paths. Zephyr Xstream accepts external sync clock, or can generate clock when required.

### We broadcast sporting events in two languages, and I want to send both mono feeds simultaneously.

A Zephyr Xstream has this capability. A Split-Channel Layer 3 transmit mode lets you send individual mono signals to separate far-end sites. This feature is ideal for bilingual programming, as the audio on each channel is completely separate. Also, Dual-Receive modes in Layer 3 and G.722 allow reception of independent audio streams arriving from two distant codecs. Ideal for network operation centers and shared equipment facilities.

More to explore at [Zephyr.com](http://Zephyr.com)

## XPORT POTS+ISDN REMOTES.

Going on the road? Zephyr Xport is the perfect companion. With Xport as part of your remote system, your studio's Zephyr Xstream becomes a universal codec, connecting with both Xport and ISDN codecs, saving money, rack space, training time, telephone lines, and conserving on console/router audio inputs and mix-minus outputs.

At the heart of Zephyr Xport is a custom DSP-based modem, optimized for maximum performance with audio codecs. Exclusive Telos technology lets Xport use a standard analog phone line to connect with any Zephyr Xstream ISDN codec; ground-breaking aacPlus coding with Spectral Band Replication delivers stunning reproduction of voice, music or both. A full-featured digital mixer with mic and line inputs (and selectable audio processing by Omnia) completes the package.

Friendly graphical display with backlight makes Zephyr Xport as easy to use as a cell phone. During transmission, operators can monitor send and receive levels simultaneously with modem performance.

Auto-sensing internal power supply means no "wall warts" to carry around or lose. Xport has no cooling fan for noise-free operation.

Navigating the Xport setup and operating screens is fast and easy with nav, scroll and select keys. Function keys can be used to trigger contact closures for remote cue, mute, etc.

Ethernet port facilitates remote control using a local computer, LAN or WAN connection and Web browser. Feed PCM audio directly into Xport from any Windows™-based computer.

Rugged shock-absorbing bumpers protect Zephyr Xport from jolts and jars. The unique ergonomic shape fits easily under the arm.

Stowable control knobs allow you to "set it and forget it," preventing accidental level changes. Push knobs in to lock settings; push again to extend for use.

Easy-to-use mixer section with Mic & Line inputs. MIX control lets you blend IFB audio with send audio for headphone and PA feeds. Front-panel headphone level adjustment controls rear-panel output.



The majority of the public switched telephone network is now completely digital. A POTS call from a Zephyr Xport is converted from analog to digital at the nearest Central Office, where it continues on a digital path all the way to the studio.

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WWW.TELOS-SYSTEMS.COM

### I read about a new coding method you're using in Zephyr Xport. Why not use MPEG Layer 3?

Layer 3 is perfect for ISDN bit rates, but less suitable for bit rates encountered with modem transmission over analog phone lines. Zephyr Xport uses the highest fidelity low-bitrate coding method on Earth: Coding Technologies' aacPlus, the combination of MPEG's AAC (Advanced Audio Coding) and SBR (Spectral Band Replication). This method improves the efficiency of the codec by 30% over "plain" AAC — which, itself, is 30% more efficient than Layer 3.

### Okay, the technology is cool, but how does it sound?

It sounds fantastic! Companies like XM Satellite Radio employ aacPlus to achieve superior results with digitally transmitted audio. Our implementation of aacPlus has been specially tuned and optimized for transmission of FM-like audio at very low (analog phone line) bit rates, with detailed highs and fuzz-free clarity for both speech and music.

### I use my Zephyr Xstream to do ISDN remotes, and they sound great. Do I need Zephyr Xport too?

Using ISDN makes for great sounding remotes, but you can't always get ISDN where and when you want it. With Zephyr Xport, you can use a standard analog phone line in the field to connect with the Zephyr Xstream ISDN codec in your studio. You'll also enjoy significantly more stable connections than with ordinary POTS codecs, due to the ISDN link at the studio end of the call.

### Some POTS codecs re-train a lot when line quality drops. Does your POTS-to-ISDN method eliminate this?

No transmission method that relies even a little on an analog signal path can completely eliminate re-training. However, our custom DSP-based modem is optimized for stability and audio (rather than data) transmission. This, along with the ISDN connection at the studio end, results in rock-solid connections that POTS codecs restricted to analog on the studio side can't provide. Even if you do have to re-train, Zephyr Xport lets you decide when to do so, avoiding the unexpected dead air that can occur with other POTS codecs.

### What happens if line quality degrades?

An on-screen connection quality display constantly informs you of line conditions. If you need to re-train, a message alerts the operator; a simple button push during a break completes the process. There's also a built-in telephone hybrid; if line performance drops dramatically, the system automatically switches to this mode so that your broadcast can continue without interruption or audio loss.

### How hard is it to operate Zephyr Xport?

We understand that sometimes remote gear is operated by non-technical users, so Zephyr Xport is designed to be very easy to use, with a friendly graphical display and online help that makes Xport as easy to operate as a cell phone. There's one-touch access to presets and space to store up to 100 auto-dial numbers and 30 locations (to recall settings for your most frequently visited remote sites).

### It sure would be convenient to have a field unit like Zephyr Xport that could connect over POTS or ISDN.

Actually, Zephyr Xport is available with an optional ISDN interface so you can connect to your studio over ISDN or POTS, depending on your needs. Zephyr Xport's ISDN option let you use Low Delay MPEG-4 AAC-LD to connect with your studio's Zephyr Xstream, providing Layer 3 audio quality with greatly reduced encoding delay.

### Tell me about Xport's mixer section.

There's a mic input, a line input for external sources, a headphone level control, and a "mix" control that lets you blend send and receive audio for headphones or PA feeds. The mixer's output is fed directly to the codec and includes selectable multi-band processing from Omnia; outputs include separate receive audio and monitor mixes for easy foldback setup.

### Why do you include a multi-band AGC and limiter? Isn't this a little over the top?

When sending audio with low bit rates, we want every practical tool to smooth and clarify the audio. That is why we went all out with a multi-band DSP approach—it really makes a difference to the quality. And we figure that during most of the time you're using a POTS codec, you'll want some control over dynamics (think sports announcers).

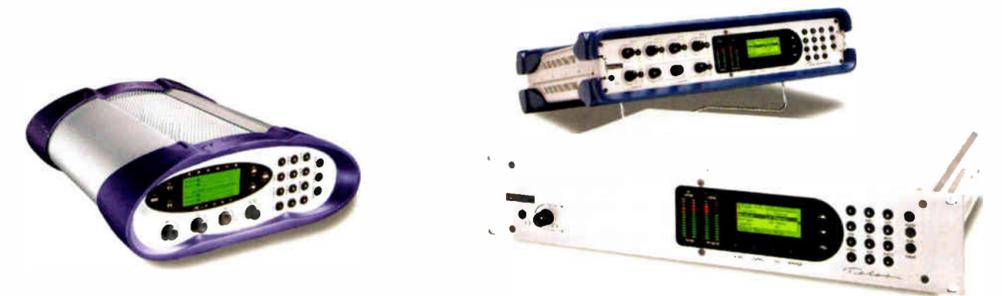
### Does Zephyr Xport include an Ethernet connection?

Yes. Like Zephyr Xstream, Xport includes an Ethernet connector for remote control via LAN or WAN, and for one-button software updates. Also, a supplied driver allows Windows (98 and up) to see Zephyr Xport as a sound card, so you can send 48kHz PCM audio directly into the mixer from your computer via Ethernet—great for including actualities, pre-recorded interviews or drop-ins in a live remote or field report.

### Does Zephyr Xport require an external power supply?

No, Xport features an auto-sensing, fanless internal power supply. All it needs is line cord suitable for your locale.

Z E P H Y R  
X S T R E A M . X P O R T



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# Almost need a third page

## ON Field o Codecs

port POTS codec  
d high-quality audio  
am ISDN codec back  
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fast and easy. It utilizes a custom DSP-based modem  
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ing; groundbreaking CT-accPlus coding which improves efficiency  
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anberry mic cable. Enter to win at [www.bswusa.com](http://www.bswusa.com) today!



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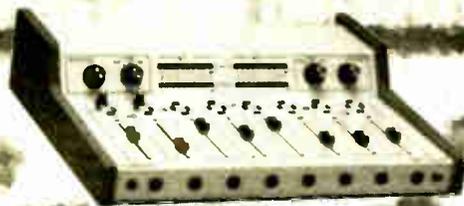


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## NEWS ANALYSIS

# Gray Market, North of the Border

*It's Easy To Get U.S. Satellite Radio Illegally in Canada; Whether Anyone Cares Is Another Question*

by James Careless

DIRECTV and The Dish Network aren't licensed for reception in Canada. Neither are Sirius or XM Satellite Radio.

However, anywhere from 520,000 to 700,000 illegal satellite dishes are in use in the country, many of them tuned to DIRECTV or Dish. These Canadians get U.S. DTV by stealing it using "hacked" equipment (the so-called black market), or by paying for it through a U.S. mailing address (the "gray" market). Either way, this reception violates Canadian law.

So what about Sirius and XM?

## In the footprint

Receiving them in Canada is illegal, said Jim Thiessen, a policy analyst with Industry Canada, the government ministry that handles radio licensing. However, the ease with which the services can be received, and the limited resources available to prosecute violators, make U.S. satellite radio reception a pretty safe crime in Canada — especially if one *pays* to receive it through the gray market. (See related story about Mexico, page 1.)

There are a few simple reasons most Canadians can receive U.S. satellite radio if they want.

The first is location. Most Canadians live close to the U.S. border. As a result, their homes are within the footprints of the two radio satellite services. If they are in built-up areas, they might suffer some interference; but with a relatively clear horizon, there's no reason southern Canadians can't receive U.S. satellite radio.

Another reason is the Web. XM and Sirius allow subscribers to buy satellite radios from third-party retailers, then to authorize them on XM's and Sirius' Web sites. In either case, the process is simple: log onto the site, enter in a U.S. address and pay for the service using a credit card.

It's this "valid U.S. address" that is supposed to prevent non-Americans from receiving Sirius/XM, and thus violating the companies' copyright agreements.

"We require that a customer have an address which is from the 48 contiguous United States, in order to access our service," said Chance Patterson, XM Radio's vice president of corporate affairs.

Similarly, "We'll sell you the service, but only as long as you have a valid U.S. address," said Jim Collins, Sirius vice presi-

dent of corporate communications and investor relations.

How does this "valid U.S. address" keep non-Americans out? Both Sirius and XM compare registrants' addresses against databases of valid

Mounties aren't likely to direct Canada Customs to seize gray-market satellite radios because it's not a priority for them. In fact, the two RCMP media relations officers who answered calls from Radio World didn't even

## Two Canadian police officials who answered calls from Radio World didn't even know what satellite radio was.

addresses. If the registrant's address is on the database, presto, his radio is authorized. If not? Forget it.

But what happens if a Canadian finds an American with the same name, then uses *his* address to register with either Sirius or XM? The answer is that they get away with it. This is because the address is only a registration tool; neither company actually mails anything to it. As long as the address checks out against the database, and as long as the credit card used is valid, the registration goes through.

## In the mail

Meanwhile, for Canadians who are less deft at theft, there's always the old "use a U.S. mailbox" routine. This tactic is common in the Canadian DTV gray market. Someone living in Kingston, Ontario, for instance, drives across the Thousand Islands Bridge to Odgensburg, N.Y. There they rent a U.S. postal box and buy a satellite radio receiver. From there, it's a quick trip back across the bridge and they're in business. (In many cases, this someone will be a middleman who gets the U.S. mailing address, then signs up illegal subscribers for a premium.)

But won't these Canadians get stopped by Canada customs officials? Not likely, according to the Canadian government satellite TV piracy Web site [strategis.ic.gc.ca](http://strategis.ic.gc.ca).

"Canada Customs and Revenue Agency has indicated to Industry Canada that they will not stop anyone from importing an American DTH satellite system, also known as a gray-market satellite system, unless specifically directed to do so" by the Royal Canadian Mounted Police, the site states.

The trouble is that the

know what satellite radio was.

In fact, all of the Canadian government sources contacted for this story were either poorly informed about satellite radio or had never even heard of it. Only by explaining its similarity to DTV were we able to get our questions answered at all.

Radio World asked the satellite vendors if they are concerned about Canadians illegally accessing their services by registering and paying for it through a bogus U.S. address.

Collins of Sirius said, "As long as a person whose purchasing has a valid U.S. address, that's all that we're required to do. We're not a policing agency; so we're not equipped to go into deep investigations to find out if someone who gives us an address is giving us a bogus address ... While we're certainly cognizant about the issue, there's not much we can do about it."

Patterson of XM said, "Let me put it this way: We have implemented the appropriate safeguards to comply with Canadian law."

For that matter, have they had any piracy problems within the United States?

"We're certainly not aware of any piracy problems in the States, since Sirius uses a proprietary chip set that has to be installed in its receivers," Collins said. Patterson said, "The XM reference platform has been specifically designed to minimize the opportunity for piracy, so we feel confident in that platform."

Should a potential Canadian gray market even concern Sirius or XM? Probably not. By sticking to their "valid U.S. address" policy, they're living up to the letter of the law. And after all, gray-market Canadians will be paying to hear U.S. satellite radio; they won't be stealing it.

As for Canadian broadcasters? If U.S. satellite services start eating into their audiences to any major extent, yes: they should be concerned. However, Canada's broadcasters have their own problems, what with the sluggish economy and Canadians' apathy towards digital audio broadcasting. Even though DAB signals and radios are available in Toronto, Montreal, Vancouver, Ottawa and Windsor, most

Canadians know about as much about DAB as their government does about U.S. satellite radio.

This said, things could change. After all, there was a time when there weren't gray- or black-market DTV dishes in Canada. Today there's so many of them that the Canadian government wouldn't dare arrest so many voters. Could the same thing happen with U.S. satellite radio? ●

## BUSINESS DIGEST

### OMT Expands MediaTouch Branding

After it went public a couple of years ago, the company that makes MediaTouch products started changing some of its branding. That caused a bit of confusion in the marketplace, so now OMT Technologies is seeking to get the word out: although it is a public company and has new products, it continues to market the familiar brand. In other words, the MediaTouch name isn't going away.

"MediaTouch — now iMediaTouch — remains the core brand of our flagship broadcast product and still plays a prominent role in our company image," said Chief Operating Officer Mariëk Wijtkamp. "Our overall branding is represented as 'iMediaTouch Broadcast Software by OMT Technologies.'"

The brand name originated with what was described as the broadcast industry's first automation software product, TouchStone, in 1984. The original owners changed the company name to MediaTouch in 1985 to reflect the product's touchscreen capability, Wijtkamp said.

In 1995, the MediaTouch product was purchased by Oakwood Audio Labs Ltd., a distributor of broadcast equipment. The company invested in the MediaTouch product line and introduced a 32-bit Windows radio automation product.

After going public in 2001, the company became OMT Technologies Inc., traded under the symbol OMT on Canada's public venture capital marketplace, the TSX Venture Exchange.

"The MediaTouch brand was altered slightly to iMediaTouch to complement the company's new and expanded iMedia product line," Wijtkamp said. The iMedia line included a logging product, iMediaLogger, as well as Internet streaming products iMediaAcast and iMediaMulti-Stream.

"Today, the iMediaTouch brand represents our flagship broadcast automation product, and remains a core offering from OMT Technologies."

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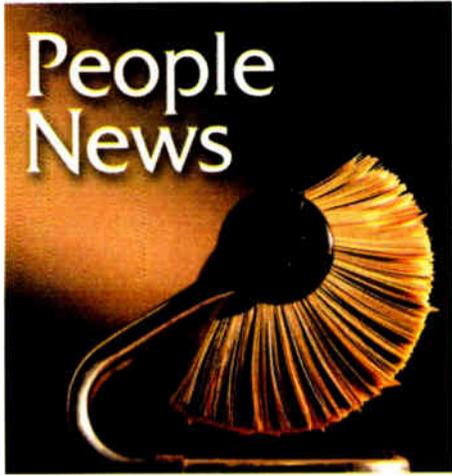
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**Launch Radio Networks** has appointed **Bernadette Duncan**, a former news editor and radio producer, to the new position of manager of programming.

**Premiere Radio Networks' Lynn Gay** was promoted from director of affiliate relations to vice president of affiliate relations.

**Live365's** Executive Vice President of Corporate Strategy and General Counsel **John Jeffrey** is leaving to launch a business and legal services firm for entertainment and technology clients. Jeffrey will continue to work with Live365 to provide legal services and advice to the company through his new firm.

**Interop**, an ad sales and marketing company specializing in radio and the Internet, has appointed **George Pine** as president and COO. Pine most recently was president of ABC Radio Sales, an Interep company. **Kevin Garrity**, former senior VP and director of national sales for ABC, will replace Pine as president there.

**UBS Warburg** named **Tim Wallace** as senior entertainment and broadcasting analyst. He will be a New York-based managing director and was a media and entertainment analyst at Banc of America.

**Arbitron** added **John Kuyasa**, formerly of Spectra Marketing, in the new position of national accounts manager of its advertiser marketing services.

**Harris Corp.** named **Richard Hammond** to VP of operations for its Mason, Ohio-based Broadcast Communications Division. Hammond is responsible for the operations of BCD manufacturing facilities in Quincy, Ill., Mason, Ohio, Littleton, Mass., and Huntingdon, U.K. Dr. **David Crawford** is now managing director of Harris Broadcast Europe and will be responsible for the business operations of European-standard products.

Harris also added in-country service pro-

fessionals for Chile, Brazil (**Marcelo Cacheiro**), Argentina, Nigeria, Thailand, Australia and the Philippines to its Broadcast Communications Division. Current service reps in Mexico and China (**Li Jianhe** and **Li Jianchao**) have been upgraded to full-time.

Harris presented a technical achievement award to **Geoffrey Mendenhall**, VP of engineering of the Broadcast Communications Division, and an innovative reuse technology award to the **BCD Ranger TV digital transmitter development team**.

**DK Audio** appointed **Anca Hansen** as its new sales and marketing manager based at the company's main office in Denmark. Hansen has held area sales manager positions at Barco and UBS. The company hired **Linda Hervoe** to sales assistant on the Orders desk. She has held export sales positions with three technical companies in Denmark.

**Paul Jenkins** is filling the new position of national sales manager for **AKG Acoustics**. Jenkins had served as AKG's western regional sales manager since March 2002.

**Lynx Studio Technology** is pulling its North American sales and marketing services in-house and appointed **Phil Moon** to oversee the effort. Moon will help support Lynx's line of computer-based digital audio products.

The **Associated Press** chose **Tom Curley**, president and publisher of USA Today since 1991, to succeed Louis D. Boccardi as its president and CEO. Boccardi is retiring after 36 years at AP, spending 18 of them as president.

**Digigram** hired **Miranda Hageman** as sales and communications director. Hageman has held previous positions with Maycom.

The **Michigan Association of Broadcasters' Foundation** elected 2003 Officers during the Foundation Board of Directors meeting at the Great Lakes Broadcasting Conference. The officers are Chairman **Tom Bryson**, the GM of WJRT(TV), Vice Chairman **Rob David**, the president of Handyman Productions and Secretary/Treasurer **Bill Keith**, the station manager of WSDP(FM).

**Francisco R. Montero**, a contributor to **Radio World**, has become Of Counsel, a senior attorney position, at **Fletcher, Heald & Hildreth, P.L.C.** Montero represents telecommunications and media clients in the areas of FCC regulatory compliances, corporate finance, commercial acquisitions and intellectual property.

**Conclave Learning Conference** added new members to its 2003 Advisory Board: **Dan Halyburton**, senior VP/GM of group operations for Susquehanna Radio in Dallas, and **David "Doc" Wynter**, VP of urban programming for Clear Channel Radio in Jacksonville, Fla. **Rob Sisco**, president of Nielsen Music & COO Nielsen Retail Entertainment Information in New York, is the newest Media member for 2003. **Lisa Ellis**, senior vice president R&B/crossover promotion for Columbia Records in New York, and **David Haley**, VP of promotions for Warner Brothers in Nashville, Tenn., are new as Conclave members representing the music industry.

**David F. Jacobs**, former director in the Media Investment

Banking Group of

Credit Suisse First Boston, joined the **First Broadcasting Investments** as managing director of business development.

The programming team of **XM Satellite Radio** was reorganized. Key appointments include **Tony Masiello**, advancing from VP to SVP of operations; **Steve Harris**, moving up from VP of third-party programming to VP of music programming; **Kevin Straley**, moving from director to VP of talk programming; **Luis Baro**, shifting from music director to program director of The Move; **Ward Cleaver**, advancing from music director to program director of Liquid Metal; **Shirley Hayes**, switching from MD to PD of Suite 62; **Sonny Fox**, changing from MD to PD of XM Comedy and **Jackson Brady**, moving from on-air personality to MD of Real Jazz.

**Emmis Communications** promoted **Val Maki**, senior vice president and Los Angeles market manager, to **Emmis Radio VP**. Maki will be responsible for operations in Los Angeles and the soon-to-be acquired Austin market. Maki joined Emmis in 1984 and has held various positions in sales and management.

**Jeff Federman**, director of sales for **Emmis Radio Los Angeles** since February 1999, has been upped to vice president/director of sales there. He will help oversee day-to-day responsibilities for the Emmis Radio-LA cluster, given Maki's new responsibilities.

**Clear Channel Radio** promoted **Alene Grevey** from regional vice president to SVP of its newly created Mid-South Region. Based in Charleston, S.C., Grevey will be responsible for multiple markets including those in North Carolina, South Carolina, Georgia and Chattanooga, Tenn. **Clear Channel Radio** of Albany selected

**Lisa Viscusi** as director of PR. Viscusi will be responsible for media relations for seven local stations and will work marketing and advertising personnel to coordinate public relations activities with promotional and sales activities. Viscusi worked previously as field sales manager at Coors Brewing Co.

Dallas-based **TM Century Inc.** added **Jackson Cervantes** to its network of international distributors to provide sales and marketing consultation for its markets in Latin America and Spain. Cervantes was VP and sales manager at **Radio Express**.

**Westwood One** appointed **Peter Kosann** to president of sales, promoting him from senior VP of affiliate sales. Kosann will direct radio ad sales for Metro Networks and oversee sales for Westwood One network, syndicated programming and affiliate sales. **Paul Gregrey** was upped to executive VP/director of sales from senior VP ad sales and will be responsible for day-to-day management of ad revenue. **Shane Coppola** is now president and CEO, succeeding **Joel Hollander**, who will take over as president and COO of **Infinity Radio**.

**American Urban Radio Networks** named **Andy Anderson** as senior director of partnership marketing.

**Anderson** joins **AURN** from **Billboard Magazine**.

**Edie Hilliard**, VP and COO of **Jones Radio Network**, has left the company to pursue new projects.

**AP Radio** named **Paul Memoli** as its newest regional sales executive. Memoli is responsible for services provided to large market stations in the Northeast region and overseeing products provided to stations in six states.

**WNEW(FM)** 102.7 **Blink** has selected **Steve Kingston** as operations Manager and **Gloria McDonough-Taub** as executive producer. Kingston will continue to serve as program director for **WXRK(FM)**.

**Chris Steinwand**, former director of marketing with **Alcorn McBride**, formed a public relations and marketing firm called **STONEjam Consulting**, which will cater to companies in the pro audio, video and lighting industries. **Alcorn McBride Inc.** will retain Steinwand



Chris Steinwand

as their marketing and PR consultant. Steinwand also signed **Dove Net Technologies**, **Atlantic Pro Audio** and **CEntrance** as clients.

**Interep** has elected **George Pine**, its recently appointed president/COO and **Arnold Sheiffer**, chairman of **Petry Media Corporation**, to its board.

**Dean Tiernan**, former product manager of editing systems at **Orban**, announced that he will provide support for digital editors and service under the company name **DAW Support Associates**.

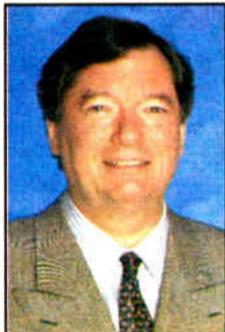
**Eventide** added **David Fournier** as director of project management, who left **Line 6** as the pro audio product manager.

**Broadcast Software International** added **Tim Rohrer** to its tech support team. Rohrer has a background in systems installation and tech support.

**David Grace**, **Nautel's** former CEO and president, recently retired after 33 years with the company. Grace plans to serve as the chairman of the board at **Nautel**.

**Scott Campbell**, who joined **Nautel** in 2001 as VP and COO, was appointed president and CEO in March.

The **Media Institute**, a Washington-based think tank specializing in First Amendment issues, has cited **Whitney Radio** editorial director **William O'Shaughnessy** as "a champion of Free Speech and Free Press." This accolade was bestowed by former New York Governor **Mario Cuomo** at O'Shaughnessy's 65th birthday party.



George Pine, top, and Kevin Garrity



Lisa Viscusi

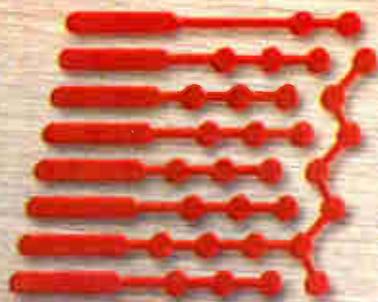


David Jacobs

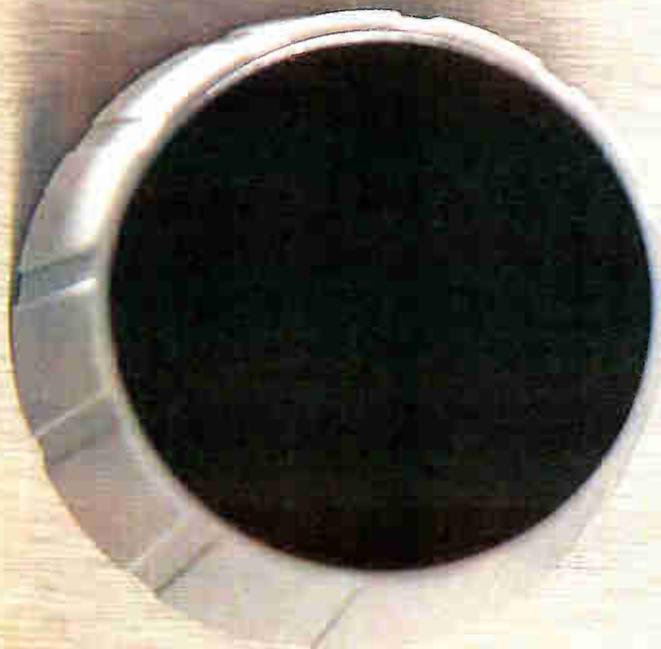
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# World Service Makes Digital Leap

by Scott Fybush

Making the transition from analog production to digital is never a small feat for any broadcaster. But when you have more than 1,200 employees, broadcast in 43 languages and produce more than 60,000 hours a year of broadcast output, going digital becomes a full-time task for an entire team of engineers.

The broadcaster in question is the BBC World Service, operating in everything from English to Kyrgyz over short-wave, FM and satellite transmitters worldwide. And its project to move from analog tape to digital production, playout and archiving is called, logically enough, "Go Digital."

## The first steps

"It began four and a half years ago, just me in an empty office," said Go Digital Project Director Tim Cooke. Today that office has grown into a suite tucked into a corner of the World Service's sprawling Bush House complex in London, filled with engineers hard at work on the transition.

Today, Bush House's three historic buildings, a short walk from the Thames, form a warren of small offices and studios for each of the World Service's languages. The biggest, such as the English and Arabic services, are larger than most individual radio stations, employing as many as 70 people and broadcasting multiple program streams 24 hours a day. The smallest, such as the service that broadcasts to Africa in the Kinyarwanda language, produce just an hour a day with a staff of four or five.

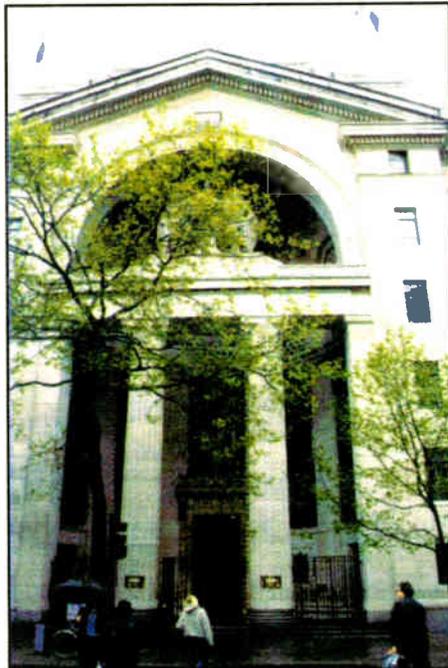
"Because this is a fairly unique operation," Cooke said with typical British understatement, "we had very particular needs."

The most critical, of course, was reliability. Because the World Service feeds not only its own transmitters but thousands of local rebroadcasters worldwide, any downtime at all would be unacceptable.

"You could be putting 200 radio stations off the air," Cooke said, "and they'd all ring you up at the same time and say, 'Where is my program?'"

Before committing to a single vendor or platform, the BBC decided to create a series of "early adopter" programs within the World Service, giving individual language services of a variety of sizes the chance to test potential systems before choosing one to be used across the board.

The vendors chosen included Finland's Jutel, which supplied its RadioMan software to the Latin



Bush House, Home of the BBC World Service

American Spanish service; Dalet, which installed its software at the Prague offices of the Czech service; Netia, which tested its system with the Hausa and Urdu services; and D'accord, which supplied its software to the Russian-language news and current affairs staff.

Those tests began almost five years ago. While they went well, Cooke says they were only a prelude of things to come.

"It's not that difficult to do it (digital conversion) on a small scale," he said. "Doing it on a big scale is a big thing to do."

So big, in fact, that traditional radio vendors found their capabilities dwarfed by the huge size of the entire World Service operation

## EU process

As a government-funded Royal Charter corporation—it draws its main funding from Britain's Foreign and Commonwealth Office—the World Service had to follow a carefully-constrained European Union procurement contract process, which forced Cooke and his team to draw up a lengthy list of capabilities needed in a digital system and requirements for a system provider.

"When it came time to tender (bids)," Cooke said, "none of these small companies was anything like big enough to take it on. They would have gone bankrupt."

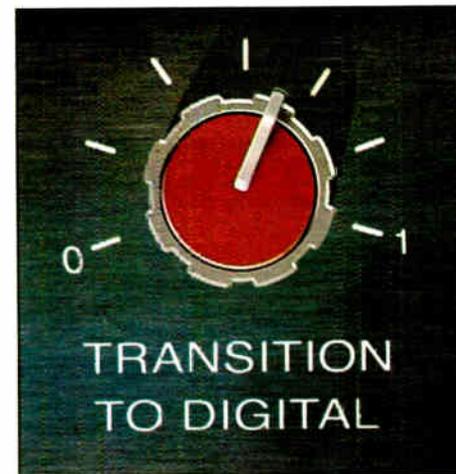
What better match for a project too big for traditional radio vendors than a company that normally finds radio to be too small a market?

When the bidding process was com-

plete—35 companies submitted bids and the World Service narrowed the list to five finalists—the winner ended up IBM, a company more closely associated with mainframes than broadcasting.

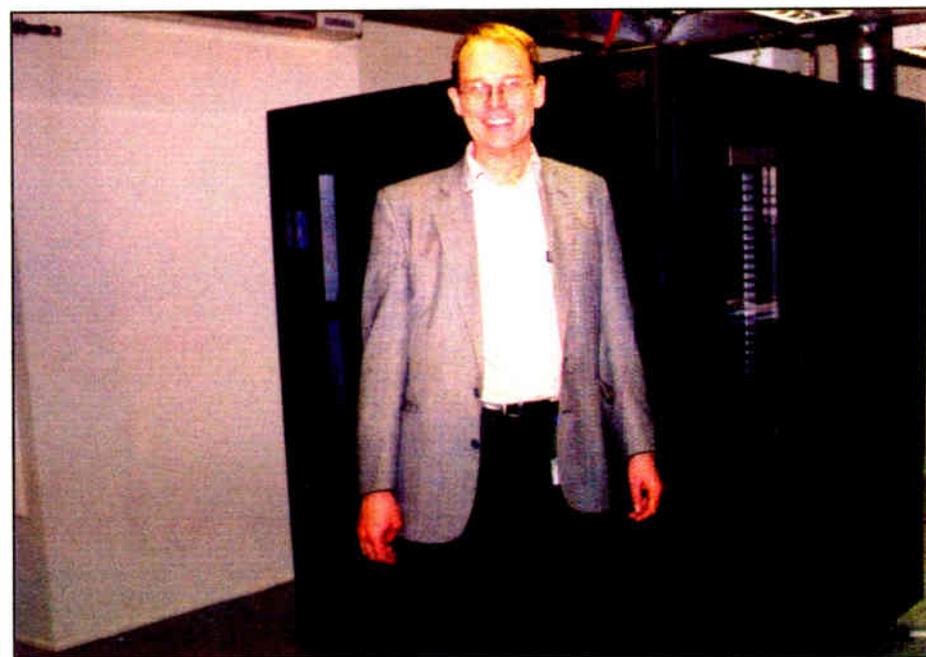
"They have the best record at building and installing big information-technology projects," Cooke said. Big Blue signed its contract with the BBC in June 2001 and soon installed full-time staffers at Bush House to begin the lengthy process of finding subcontractors and building a digital system.

While the BBC won't disclose the total price tag on the project—it's believed to run well into the millions of pounds—Cooke says IBM's bid was the most "reasonable."



day," Cooke said, "so how do you get into a studio to do things?"

The answer, at least as far as testing the system before a full rollout, proved to be the construction of still more studios. Two "training studios," under construc-



BBC Go Digital Project Director Tim Cooke stands in one of the server rooms at Bush House.

Under the contract, IBM Global Services is responsible for all dealings with the vendors supplying the actual broadcast equipment and software. One of the early tasks for the Go Digital team was to draw up a list of specifications for an improved version of Jutel's RadioMan software, then hand it over to IBM and let them do the rest.

"There are times when you might like to sit down directly with software manufacturers and say, 'Can you do this? Can you do that?'" Cooke admits, but he believes that the hands-off approach through IBM has helped prevent the "mission creep" that can result from having software developers constantly on hand during design and installation.

With the IBM team comfortably installed in Bush House, one of the first tasks was to build the server complex to handle the World Service's many demands. With reliability as the main concern, IBM ended up installing two fully-redundant server rooms in separate wings of Bush House, each with its own set of connections to every studio and production desktop in the building. The contract with IBM promises 99.97 percent uptime, with no interruption in broadcast output.

Just getting the infrastructure in place was no small feat. Bush House was built in the 1930s and is listed as a London landmark. With services for almost every time zone, it is rarely quiet.

"This place works day and night, every

tion at Bush House, will give engineers and World Service staff an opportunity to work with the system and become familiar with it before it arrives in their own offices and studios.

"It's vitally important to make sure everything is working before we inflict it on the journalists," Cooke quipped.

## Splicing tape and razor blades

Outside of the four languages that were "early adopters" for digital, a walk through Bush House today finds a collection of equipment and practices that would be perfectly familiar to a broadcaster from decades ago.

While reports from overseas now arrive by satellite or the Internet, they still end up being edited on good old 1/4-tape, with just a razor blade and splicing tape. Those tapes are cued up for broadcast, then archived in analog form. A few of the language services are using DOS-based audio editing systems.

The leap to all-digital will be a big one, Cooke admits, which is why the World Service believes it's vitally important to get it right the first time.

Jutel designed a new version of RadioMan, customized to meet the BBC's needs. RadioMan 5.1 incorporates "broadcast-critical interfaces with the other systems in the building," Cooke said, including not only the IBM servers but the Associated Press' ENPS newsroom computer system in use

See BBC, page 31 ▶

## Product Showcase



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# BBC

► Continued from page 30 throughout the BBC.

When the rollout is complete, each language service will have at least one "critical office workstation," designed specifically to run RadioMan in as stable an environment as possible. Other desktop computers in each service will be equipped to edit audio, as well as handling staffers' e-mail, Web access and the ENPS newsroom system — and in most cases, that means upgrading existing desktop machines throughout Bush House.

Each studio will have two playout machines, a master and a slave, both running the same playlist to ensure on-air redundancy should one fail. A new archive facility will store programming in MPEG I, Layer II format.

## Training the trainers

With about 1,000 of the World Service's 1,200 staffers located right in London at Bush House, training, too, becomes a massive task. As Go Digital goes live later this year, the plan is to have IBM train the World Service's own engineering team, while the BBC will handle training for each language's staff of journalists.

That process is due to begin this month, when the first language services begin to train on the system. Cooke envisions the process as a "continuum," saying the goal is to explain to journalists exactly how the system will work before any actual training begins.

A written guide on the BBC's intranet will also be available to guide staffers — and Cooke says journalists will have plenty of time to become familiar with the system in their own offices before the reel-to-reel machines disappear for good.

While journalists are being trained in one of two training studios, IBM's crews will be upgrading their workstations.

"When they get back to the office the next day," Cooke said, their PC will have been converted to the Jutel/IBM system, "and they can get started straightaway."

The decision of when to make the cutover to digital in each language service won't come out of Cooke's office, though; that's a choice each service will make on its own.

The BBC expects to have everyone in Bush House trained on the system by the first quarter of 2004.

## Supporting the system

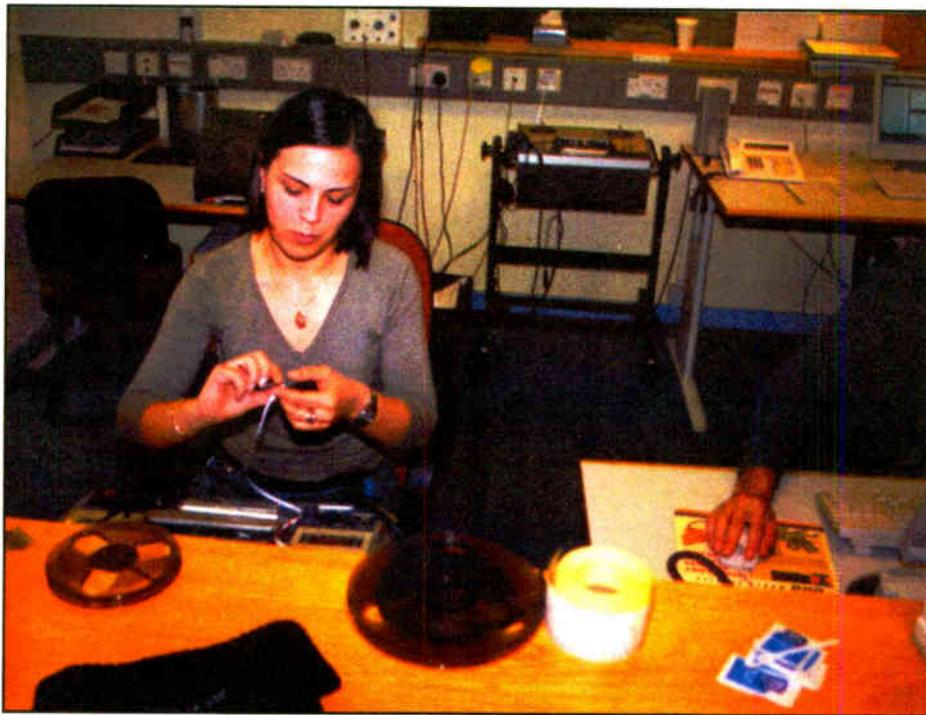
Once "Go Digital" is up and running, Cooke's work will be far from finished. Supporting a thousand-user digital environment is a huge undertaking, something Cooke says will require the BBC to rethink its entire engineering department.

Traditionally, one department at the BBC looked after the broadcast gear, while a separate group of engineers handled information technology. "Obviously, that doesn't work anymore," Cooke said.

Instead, Go Digital is building a new integrated support system, designed to "use some of the technical staff to be available as much as possible" to assist users, Cooke said.

The plan is to retrain some of the production engineers who will no longer be needed to operate tape equipment, giving them enough background in IT to allow them to fix small problems with the Go Digital system themselves.

One key to the new support system will be a single phone number anyone at Bush House can call for help with any of the new systems. Support staff at the other end of the phone line should be able to solve most problems over the phone, Cooke said, but if not, they'll be "sitting in the same room as the guys with the spanners" to handle bigger fixes.



Albanian Service Producer Adelina Bekteshi edits a segment the old-fashioned way.

The Bush House installation is only one piece of the World Service project; once it's finished, the IBM/Jutel system eventually will be installed in other World Service offices around the globe. What's more, the BBC is planning to move the World Service out of Bush House before the end of the decade, combining it with domestic BBC radio in an expanded Broadcasting House facility across London.

The World Service isn't the only part of the enormous BBC organization to make use of the IBM/Jutel collaboration: even before its project began, 26 of the BBC's 51 local radio stations across the United Kingdom had started using a simplified version of RadioMan, though on a much smaller scale than the World Service.

Cooke admits that the outlay of time, money and resources on Go Digital is "not a project that will produce a return on investment" for the BBC's bottom line, at least at first. But he believes it will ultimately pay off in increased productivity from a staff that's increasingly trying to produce material not only for live broadcast but for Web users as well.

"You can produce more output with the same resources," Cooke said. In the case of the Czech service, one of the early adopters of digital audio, productivity from the Prague bureau increased 16 percent after the move from analog tape, an important consideration for a service that was targeted for cutbacks or elimination.

Cooke says without the shift to digital (and a relocation of staff from London to Prague), the Czech service might not even exist now. Instead, the BBC World Service has added more than a dozen full-time FM relays in the Czech Republic.

"If there is a crock of gold at the end of the rainbow," Cooke said of digital cost savings, it comes in the area of scheduling and playout. Instead of the labor-intensive and error-prone procedure of cueing and loading tapes, going digital

will allow World Service languages to create more hours of programming with fewer staff resources.

Increasingly, though, Cooke believes the World Service is moving from a model of live broadcasts at specific times to a model of on-demand audio through the World Service's Web site. Its usage exploded from 39.1 million users in

ly to increase the programming it can make available through streaming audio.

## Make sure you know

The Go Digital project is far bigger than any U.S. broadcast organization is likely to attempt; not even the radio networks or the Voice of America come close to the sheer size of the World Service's staff.

But Cooke says there are still plenty of lessons smaller broadcasters can learn from his experiences across the Atlantic. First, "make sure you know what it is you want to do," he warns.

"Do not go out and buy a load of kit and bring it back and say, 'What are we going to do now?'" Cooke said. Instead, sit down in advance with not only engineers but business staff and end users to determine what a digital system is needed for and what capabilities it will require.

"Preparation is vital, communication is vital," Cooke said. "You have to tell people what's going on and listen to what they're going to say."

The process may seem slow, Cooke said, but with more than five years already under his belt planning Go Digital and months to go before it goes live, he says planning and training are time that's never wasted.

"You've got to live with this stuff for quite a while," he said. "Communication and training are two things you can never get enough of."

Scott Fybush (scott@fybush.com) is a frequent contributor to Radio World, although usually from the western side of the Atlantic.



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FIRST PERSON

# One Engineer's Tire Problems

by Mark Persons

Car tires and I have had a love-hate relationship for some time.

I build and repair radio stations for a living. One requirement of the job is to carry huge quantities of test equipment and parts along.

My vehicle of choice is the Chrysler Grand Caravan with 16-inch tires and automatic load leveling. Speaking of loads, there is a 2,500-watt, oil-cooled dummy load in the van, too.

My life has been one flat tire after another. It is easy to overload a vehicle and cause tires to run hot. This will cause

early failure of the cords.

It took a few such blowouts to bring me to the realization that more tire pressure is needed for the task. I add 4 pounds to the recommended tire pressure on the rear tires and 2 pounds on the front tires. Best check with the tire and car manufacturer's recommendations before trying this one.

Working at transmitter sites under construction is a sure way to get a nail in a tire. In fact, I would go so far as to say that tires are natural magnets for nails. Do carpenters purposely spread nails around?

The other day, I pulled up to a transmitter building and heard an all too

familiar "pop." What was it this time?

A ground rod had apparently been pushed up by the seasonal freeze/thaw cycle. The top was less than 1 inch above the surface of the unimproved road. That was all it took to put a 1/2-inch-diameter hole in a tire where the tread meets the side wall. Anyone driving ground rods should think this one through before committing such an act of terrorism.

One winter, I hit a 4-inch rock on a snow-covered transmitter site road. Hitting such a rock would not be a problem in the summer, but the temperature was -30 F. The van tires were venturing out almost as cold as I was.

The two van tires, on the passenger side of the vehicle, hit the rock. I didn't think much about it until it was time to leave. There they were, still holding pressure, but with large bulbs of rubber blossoming out from the side of both tires. It looked like a clown car that you might see in the movies.

Like Rodney Dangerfield says, "I don't get no respect." Needless to say, cords in both tires were broken and beyond repair. To make matters worse, the warranty did not cover this type of road hazard.

**I pulled up to a transmitter building and heard a familiar 'pop.' A ground rod had been pushed up by the seasonal freeze/thaw cycle.**

My wife Paula (WØHA) has no problems with car tires. She doesn't have flats. I remember spending 20 minutes one day showing her the fine points of tire-changing while doing just that on a van tire that had picked up a nail and had gone flat overnight.

When finishing the lesson, I stated, "Now you know how to change a tire." To which she replied, "Yes, I call the AAA."

Mark Persons WØMH is certified by the Society of Broadcast Engineers as a Professional Broadcast Engineer with more than 30 years experience. His Web site is [www.mwpersons.com](http://www.mwpersons.com).

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### Ten Years Ago

Some manufacturers and digital equipment users have called for a standard to deal with audio compression algorithm "stacking." But actually creating a standard, especially for broadcast equipment, may be difficult, according to members of broadcaster and standard-making groups.

Following the revealing listening test results demonstrated by Herb Squire, chief engineer, WQEW(AM)/WQXR(FM), New York, at the National Association of Broadcasters convention, the issue has become one of the most talked-about in the industry.

Squire's tests showed that running audio through different compression schemes can degrade audio significantly. ...

Recent discussion has centered on possible interface standards. The Audio Engineering Society, the National Radio Systems Committee, comprised of EIA and NAB members, and the international ISO/MPEG and CCIR standards groups have all begun or could soon begin considering such standards.

*"Compression Standard Not Easy to Implement"*  
by John Gatski  
June 23, 1993

# Studio Sessions

School  
Daze With  
ARP

See Page 36

Radio World

Resource for Radio On-Air, Production and Recording

June 18, 2003

## M Audio's Take on Active Monitors

by Alan R. Peterson

The choices in studio monitors are greater now than ever before.

At one time, the likeliest monitor speakers to be seen in a broadcast or production room would have been a seriously large set of JBLs or a stiff set of E-V Sentrys.

### Newer names

Since then, newer names such as KRK, Event, Hafler, Genelec and others have supplanted these classics in many facilities.

Helping this trend along has been a

shift to nearfield monitoring; placing speakers up close to the producer's position and minimizing the coloring of the room acoustics as much as possible.

Joining the fray, the Studiophile BX8 Studio Reference Monitor from M Audio — a highly precise bi-amplified active monitor with a sharp look, a cleanly defined sound and the means to gently tune the monitors to the room acoustics rather than vice versa.

These units are superb performers both in production and on-air situations. Personal studio owners will find the BX8 a capable monitor, as will audio-for-video producers, musicians and multi-

media authors. And, at \$599 per pair, are comparable to the cost of passive monitors and their companion amplifiers.

For serious desktop audio production, the BX8 is an ideal step up from the laughably labeled "audiophile" speakers that come as part of a computer purchase. Mixes done on those budget computer speakers come across as amateurish when played on other systems.

### Under the microscope

Each BX8 is packaged with an individualized frequency response chart, evaluated and printed before leaving the factory. Microphone manufacturers such

as Sennheiser have been doing this for years and, in spite of the additional expense, I wish more companies did this.

The evaluation that accompanied my set of BX8s showed some brightness tip-up from 3 kHz on up to about 15 kHz. I predicted this would mean I had to dip the highs down a little, which I ended up doing.

Part of the reasonable cost comes from the construction of the BX8 enclosure: strong, nonresonant medium-density fiberboard (MDF). This is very cost-effective compared to veneer ply cabinets. A laminated vinyl finish layer is outside with plastic foam inside for acoustic damping.

Many nearfield speakers today boast  
See M AUDIO, page 39 ▶

### PRODUCT EVALUATION

## Heil Goldline Pro: New Dynamic Mic

by Ty Ford

The never-ending search for a better cardioid studio microphone has led us down many roads. Some have found a liking for condenser microphones, with their higher sensitivity and wider frequency response. Condensers can make dynamics sound muffled and not as open.

### Voice mic

Condenser mics normally are used on voice in the recording of agency-produced spots. The mics are part of the "big-time" sound that so many

radio production directors would like to have. There are, however, several reasons condensers may not be the right choice for a radio studio.

You cannot "eat" most condenser microphones. When you do, the proximity effect turns the voice to mush. Equalization can be used to correct the mush problem, but that opens up the issue of how capable the individual person is at using a good equalizer.

Most radio people eat the microphone for two reasons. First the closer they get, the bigger and warmer they sound. Second, the closer they get, the less of the room and other noises are heard.

If your studios are tiny and have a lot of glass or hard reflective surfaces, even working a good condenser mic closely is no guarantee that you will not hear increased room noise because condensers also hear high-frequency reflections much better than most cardioid dynamics. The combination can add up to a less-direct, less-intimate sound.

Enter the Heil Goldline Pro (\$130) cardioid dynamic microphone.

Its heft tells you that the zinc die cast steel body is not likely to be easily damaged. Although the shiny steel body and gold headgrille of the current model could be described as glitzy, you may like its show-bizzy appeal. A flat black body and steel-colored headgrille are in the works.

The Goldline Pro has a 1-1/8-inch quilted aluminum diaphragm. Designer Bob Heil says the capsule has gone through a lot of tweaking, especially the phasing plug and

See HEIL, page 34 ▶



## Interactive RDS/RBDS

Model 711 - \$1350

### LINK IT TO STATION AUTOMATION!

This multi-featured encoder communicates with station automation to send song titles, phone numbers, contest results and promo or advertising messages for immediate display on listeners' radios. It also features the "TA flag," capable of temporarily overriding other program choices—even tapes and CDs—when your station broadcasts a traffic alert.

The 711 is quickly programmed with the usual format identifiers, translator frequencies and other static data. Its RS-232 serial interface connects with any PC, and with most automation systems for dynamic messaging. Giving access to all the most-used RadioData groups and features, this versatile encoder complies with both NRSC and CENELEC RadioData standards.



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# Heil

► Continued from page 33

porting that determines the amount of proximity effect and shape of the pattern.

The specs show a 40 Hz - 18 kHz,  $\pm 2$  dB frequency response with -55 dB at 1 kHz sensitivity. Heil has not measured the SPL yet, but says this microphone has spent a lot of R&D time with rock performer Joe Walsh singing into it. According to Heil, Walsh will be using them for vocals on his tour this year.

## In the studio

I compared the Heil Goldline Pro to an EV RE27ND at my studio and also a Sennheiser 421 and Shure SM57 with engineers Louis Mills and Mark Patey at Flite Three, a professional studio in Baltimore.

I used an Aphex 1100 two-channel preamp with Gotham GAC-3 cables at my studio. The Aphex 1100 fed my Digidesign Digi001 audio interface via S/PDIF. The RE27ND, with none of its EQ switches engaged, was edgier and brighter, although not necessarily better.

I have come to prefer the RE27ND with the HF tilt switch on. In that position, the Goldline Pro was brighter without being edgy. The RE27ND had been about 3 dB more sensitive than the RE27ND with the top tilt off, but with it engaged, the sensitivity difference dropped to about 1dB. The microphones required about 60 dB of gain from my preamps.

At these settings, the RE27ND sounded smooth and smoky and it was quieter. The Goldline Pro was brighter and clearer but also generated some low-level HF noise. The RE27ND has a more generous hot spot that rolls off fairly gently; the

Goldline Pro hotspot is smaller and falls away quickly.

At 180 degrees, the RE27ND exhibited better cancellation, but the sound was thinner and phasier than the Goldline Pro.

When I placed both mics on the counter next to my Aphex 1100 preamp I heard some hum. The hum was coming from the Goldline Pro, which was picking up the noise from the Aphex 1100 internal power supply.

## Condenser mics are part of the 'big-time' sound that so many radio production directors would like to have.

As I backed the microphone away to about six inches from the power supply end of the Aphex 1100, the hum disappeared. The RE27ND needed to be on top of the Aphex before it picked up the hum.

This prompted me to see how well the microphones did around my DAW CRT. Both picked up some EMI hash at about a foot away from the front of the screen, the Goldline Pro a bit more.

The Goldline Pro, however, picked up an EMI lobe 45 degrees left or right of the monitor from two feet away. If you are using a 421 Sennheiser now without problems, the Goldline Pro should work fine. My flat-panel digital monitor caused no problems.

I found the optimum working distance for the Goldline Pro to be about 1-1/2 inches. Any closer and it mashes up and

breath eddies become too obvious. The RE27ND and Goldline Pro were equally sensitive to popping.

## Flite Three

At Flite Three, using Focusrite Red preamps and Gotham GAC-3 cable I set the Sennheiser 421 one click off M. Both mics had virtually the same sensitivity. At a distance of 1-1/2 inches, the 421 sounded more nasal. At 3 inches, the 421

was honky. At 6 inches, both microphones sounded somewhat similar.

I put a Neumann U 87 foam pop filter on the Goldline Pro. Its 3/4-inch of open cell foam smoothed the top-end response and eliminated the breath eddies, improving the sound of the Goldline Pro. A good open foam filter is a must here for broadcast folks who eat the microphone.

The Goldline Pro had less off-axis phasiness than the 421. The side pattern of both microphones was similarly tight. The 421 offered slightly more rejection from the rear. The Goldline Pro has a slightly higher LF presence there. The two mics had similar amounts of handling noise, but the spectra of the 421 noise was higher than that of the Goldline Pro.

I then turned to the SM57. The Goldline Pro had about as much handling noise, but was smoother in the upper mids and sibilant sounds were also smoother. The Goldline Pro was also clearer sounding.

**Product Capsule:**  
Heil Goldline Pro and  
Heil Classic Microphones

**Thumbs Up**

- ✓ Relatively inexpensive
- ✓ Sturdy body
- ✓ Open sound

**Thumbs Down**

- ✓ EMI sensitivity

Price: Goldline Pro: \$130;  
Classic: \$269

For information contact Heil  
Sound Ltd. in Illinois at (618) 257-  
3000 or visit [www.heilsound.com](http://www.heilsound.com)

At its price point of \$130, the Goldline Pro falls into line. It is more expensive than an SM57 — and sounds like it. With the section of the EMI problem, it is also a possible alternative to more costly radio studio standard microphones.

A humbucking coil to improve its EMI rejection would probably not cost that much.

The Heil Classic (\$269) in the RCA 44B-style housing uses the same dynamic cardioid capsule as the Goldline Pro, however the tight directionality of pattern is lost both because the backside is pointed downward and because of the acoustical environment inside the headgrille.

Engaging the LF roll-off switch on the base of the microphone only makes it sound worse. This mic looks nice and evokes that "old time radio" feeling, but I wouldn't use the Classic or an RCA 44B on the air or in production.

Visit the author's Web site at [www.jagunet.com/~tford](http://www.jagunet.com/~tford) for V/O demos, audio equipment reviews and other services of Ty Ford Audio.

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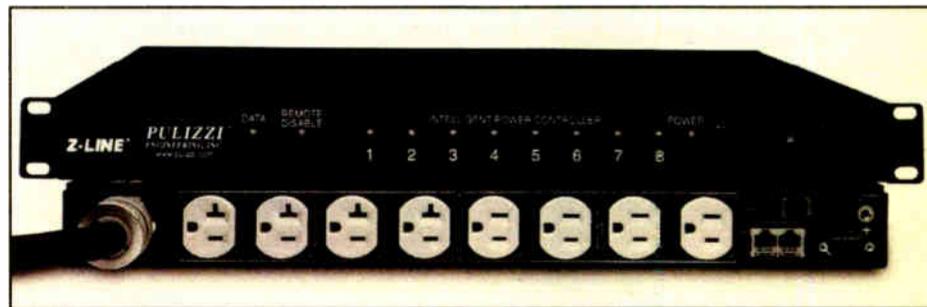
## PRODUCT GUIDE

### Power Controller Allows Off-Site Control

The Intelligent Power Controller IPC3402-2756 from Pulizzi Engineering is targeted at power density and control and management needs in rackmount systems.

The IPC provides 24 amps of power in a 19-inch, 1RU unit, eliminating the need for multiple power sources and concentrating input at one high current source.

It provides TCP/IP and RS232 communications ports for remote power control of critical systems. With an Internet connection, it is possible to remotely reboot locked equipment or control system power from anywhere.



Power up/down sequencing limits inrush problems and provides user-configurable sequencing. The IPC3402-2756 uses the same Telnet and Web browser as other Pulizzi IPCs, which allows it to connect to other IPC34XX series power controllers and permits 80 outlets at one IP address or using one telephone line. The unit has local on/off control of each outlet for onsite maintenance.

The IPC includes detachable mounting brackets that can be replaced with either vertical mount (ORU) brackets or an optional cable restraint/management system KIT-CABLRES-01 (\$59) that allows for cables to be secured and routed.

Price: \$989; quantity OEM discounts are available.

For more information contact Pulizzi Engineering in California at (605) 334-8999 or visit [www.pulizzi.com](http://www.pulizzi.com).

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# Al the Professer Blows Off Steam

by Alan R. Peterson

So close to the first official day of summer, this would be a good time to file away my books and papers for yet another summer.

Longtime readers know that I have dipped my toes into academia in the past couple of years, teaching broadcast techniques and audio production for two educational institutions here in the greater D.C. area: the Connecticut School of Broadcasting in Arlington, Va., and Montgomery College in Maryland.

What makes this so ironic for me is that I never pictured myself in such a role. Me, a teacher? I'm supposed to be a wacky DJ, or at least that is what I set out to be ages ago.

It's still awkward being called "professor" instead of "pukeface" (as in, "Hey pukeface, why haven't you played my request yet?"). It's difficult for me to put down the duck call and whoope-whistle from the studio and pick up chalk.

And it is especially difficult to see myself in the same role as those gray-haired, thick-waisted old doofuses that taught radio in my day, knowing full well back then that I knew everything and they did not.

Now, in spite of that lovely logo of me balancing the globe on my fingertip, I am just as gray, probably just as thick around the middle and perhaps just as much of a doofus to my students as my instructors were to me back in the day. And naturally, they know more than I do.

At least until I fire up the audio editor and throw flames just as well as the production people they admire on their favorite rocker. That's when I know I've won them over for another semester.

## No. 1: Buy more chalk ...

Anyway, while the folders are still out, I want to pencil in a few notes to myself for the fall semester. So, as I cue up "See You in September" on the wife's classic AMI Continental II jukebox, I would be happy if you stuck around so I could share them with you.

Perhaps you are already a broadcast instructor, or considering a shift into academia, especially when you find out there is no longer a call for wacky DJs and need to try something new.

These notes will be for the benefit of both of us.

*RTFLS:* In the polite version, "Read the Lab Sheet." In spite of my best efforts to make mandatory audio production lab assignments easy to understand and execute, many students collect handouts of lab procedures without so much as taking a peek at the text. I could probably insert the words *take this sheet back up to Mr. Peterson and he will give you \$25 just for reading it* in the body of the text and still get no reaction.

When a student hands in a recorded lab project on a CD-R, it is supposed to be submitted with a card detailing the process, particularly name, studio number, total runtime and the name of the course. This is clearly indicated in each assignment's lab sheet.

However, I regularly get handed a disk with someone's initials only, applied with a Sharpie and quickly smeared. So for next semester, I should endeavor to make the process clearer, or start offering the 25 smackers.

*We're not teaching ACID.* Or Cakewalk. Or Cubase. Or ProTools. Or any other software that is primarily a MIDI-based music system or a music looping creation tool.

Every time I start a new semester, I explain to my eager new charges what the course will be about — audio recording editing as it applies to radio broadcast — and what software we will be working with. By the time I get to details about midterms and quizzes, faces begin to fall.

## No ACID

"Will we be learning ACID in this course?" someone will ask me. And I reply, "Do you already know how to use it?" Naturally, they answer in the affirmative, in all hopes that the class would be an easy stroll for them. "Sorry. No, we won't be working with ACID."

The fallen face usually drops further. It is then that I usually state, "I have a 13-year-old daughter who is probably better at ACID than you or I!"

The first time I was asked this, I suggested that perhaps the Music Department offered something appropriate. But evi-

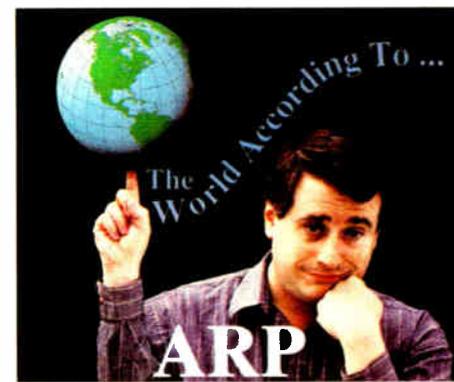
dently the music faculty would rather offer courses in Theory, Harmony, Counterpoint and practical experience on an instrument — the barbarians.

One of two things happens about here. They stick it out for the semester and come away with an appreciation for being able to record and edit their own work instead of massaging someone else's loops. Or, they are so ticked that I never see them again after week three.

*This is a cart machine. Forget you ever saw it.* I will teach whatever my bosses want me to teach. Fortunately, in both venues where I share my (ha!) wisdom, they are formidably up to date.

But here is a word for the future to anyone who heads up a college or vocational radio broadcast course and still teaches about carts and reels: digitize now. You are already four to six years behind the curve.

The argument I have heard in recent times is that "this is what grads will find in the real world." I cannot go along with that anymore. Even the smallest of small stations has had to digitize, out of the reality of service costs on cart decks.



Do you realize you can get an E-machine brand PC with audio capabilities for about the price of a replacement triple-deck motor?

Nobody has shown up at the last two NAB conventions with a cart machine. And those future grads still have four years of school to get through. You think that first job will still have a cart machine waiting in 2007?

I am not about to believe someone will be denied a broadcast gig because they cannot dub a cart. I would rather hire someone with a good head for FCC rules and regulations, someone who can confidently send an EAS test, handle good phones and do decent production. I can always show them how to dub a cart later if it is so darned important.

See ARP, page 37 ▶

## TIPS AND TRICKS

# High Fidelity or Good Sound?

by Bruce Bartlett

The original concept of a "good recording" was high fidelity. In making a classical music recording, we tried to capture faithfully the musical instruments and their acoustic environment. Even if the concert hall sounded mediocre, engineers tried to document that sound in the pursuit of realism.

That approach has a serious drawback. Suppose the hall has a short reverberation time — too short for the style of music being performed. Ideally the hall reverb should lend grandeur and space to the music, almost as an effect. But if we record in a dry auditorium, the music can sound small — something like an amateur recording of a high school orchestra.

## Unsuitable acoustics

In fact, the capture of unsuitable acoustics is a hallmark of amateur classical recordings. Ever hear tapes of high-school bands, choirs or orchestras? Because these ensembles do not perform in great-sounding concert halls, the recordings often sound amateurish in spite of good recording equipment and careful microphone placement.

People who listen to these recordings may not know that they are accurate, but they do know that they sound bad.

Why not place the recording microphones farther from the ensemble to pick up more reverb? Distant mic placement does increase the ratio of reverb to direct sound; it does not, however, increase the reverberation time, which is what we want.

One solution is to remove the room acoustics where the performance took place and replace them with the acoustics of a good concert hall. Use close miking to take out the dry hall sound, then use digital reverb to substitute a hall with long reverberation time. The result is a recording that may not be true to the original but sounds good. In other words, the music is supported by a reverb effect that

is aesthetically pleasing.

Ideally, recording would occur in a quality environment. The reality is that the ensemble is recorded where it has been scheduled to perform. If that room sounds inadequate, try removing it and substituting a "room" that sounds better.

It is like using a blue screen in TV weather shows, where the TV studio is removed from the shot and the background is filled in with a weather map.

Another reason for close miking and digital reverb is to prevent the pickup of background noise. Suppose the recording venue has noisy air conditioning, traffic sounds or audience mumbles. Listeners to your recording will not be impressed by how accurately you captured those noises.

## If we have to record in a dry auditorium, the music can sound small — something like an amateur recording of a high-school orchestra.

In an ideal situation, one would turn off the air conditioning and record late at night, without an audience. These options, however, are not always available.

Consider using close microphone placement to increase the signal-to-noise ratio. Then add a touch of digital reverb to make up for the lack of reverb caused by close miking. The result is a clean recording with a pleasant sense of space.

Close-miking a choir, orchestra or band can cause sonic problems of its own.

Suppose you normally mike an orchestra in a particular hall with a stereo pair about 15 feet from the front row. When you place the microphones closer, perhaps eight feet away, the front row of the orchestra is emphasized over the back row. In other words, close miking can

upset the musical balance.

One way to compensate is to use more microphones. Place some microphones near the back rows and mix them with the front mic pair (watch out for phase interference). Raising the mic pair higher, which places the mics farther from the front row but not from the back row, is also a possible solution. With a choir, use four mics about three feet away instead of a stereo pair 12 feet away.

## Harsher tonal balance

Another problem of close miking is its harsher tonal balance. Compared to a distant microphone pair, mics near the ensemble often pick up a brighter sound with too much detail and too much

emphasis on individual voices. It can help to cut a few dB around 10 or 12 kHz and use mics with a fairly wide polar pattern.

Artificial reverb used on classical recordings must be of very high quality or else it sounds, well, artificial. Add as little as possible, and consider using reverbs that model actual acoustic spaces. In these expensive units, the impulse response of real halls is convolved with the dry signal being recorded. The resulting reverb sounds quite smooth and realistic.

Ideally we select a recording hall with great acoustics and low noise. In that case, we do not want close miking or artificial reverb. If reality dictates that a compromise, however, the "close-mic-and-add-reverb" approach can turn a dry, noisy recording into a commercial-sounding one. 🌐

# ARP

► Continued from page 36

As far as reel editing goes, how necessary a skill is that anymore? I used to enjoy showing folks how I could splice out the plosive in a popped "P" recorded at 15 ips. Now any one of my students can do it with a mouse.

Also, it has been eight years since I last aligned, calibrated and azimuthed a four-track reel machine. I miss doing it like I miss my torsils.

*Thou shalt learn Files and Folders.* I intend to give my students a tiny micro-lesson in the Windows and Mac file hierarchies.

Files are misplaced all the time in the office, in classrooms and on home machines. A quick poke around with the Find function solves a lot of problems.

Now try that with a station server. It is bad enough you cannot find the McDonalds two-for-one spot that has to run this week *anywhere* on the main studio audio box. Try hunting back through the shared disks on the whole system.

Let's see, is it on the production box? Backup production? Did it end up somehow on the Sales drive? Did it get shadowed to the master library disk? Where could it have gone?

In my lessons, students have to save audio assignments to their own personal folders. Also, they have to be placed in a main Assignments folder and perhaps backed up on the local machine where produced.

With so many destinations to worry about, no wonder audio can get lost. A brush-up on how and where computers store their audio is in order for next semester.

*Let Aunt Polly hear your work.* Remember when kids couldn't wait to get home from school to show off the spray-painted pasta necklaces they made in class?

Part of the labwork in my course includes the creation and execution of a 20- to 30-minute radio show, including timechecks, weather summaries, songs and live commercials.

In spite of lab procedure that specifically states all music must adhere to local and FCC standards of obscenity and suitability for airplay, a number of students still insist on bringing in CDs soaked with potty words and violent imagery.

Projects handed in as such are generally failed and given a zero. I instead just lop off a lot of points and ask what they were thinking.

"I don't own any clean songs," some will say. I answer, "Borrow some."

"Hey, I heard that song played the other night on the radio," I will also hear. "Really?" I inquire. "Which station and at what time?"

I am not a prude. I just think a student should come home from one of my classes with something that old Aunt Polly could listen to. They could not wait to show off that pasta necklace as kids, so why not show off that killer radio show?

Besides, what if that first job is at a soft rocker? What kind of audition disc is that going to be like? And what if they have a cart machine? (*Kidding! Kidding!*)

Anyway, there are far too many notes to scribble in the margins for now. Pool opens in about 30 minutes, it has been a tough semester and it's far too easy not to think about school on a day like this.

Maybe by Sept. 1, I'll have my lesson plans firmed up. 🌐

## Expanded MatchMaker Product Line Available

Audio Technologies Inc. designed 10 new products to expand its MatchMaker line of audio signal converters. The converters range in capacity from two to 10 channels. The MatchMaker units feature low-noise audio signal converters that use high-speed operational amplifiers for impedance and level matching. Models have front-panel gain control. The eight- and 10-channel versions use plug-in Euroblock connectors; the other models use gold-plated RCS and XLR connectors.

MatchMaker PRO models feature transformer isolated outputs for driving lines up to 2,000 feet without signal degradation and flat frequency response down to 20 Hz. ATI promises.

Other product news from ATI includes introductions of the MMA800-XLR eight-channel mic preamp and the MLA800-XLR eight-channel line amp.

The MMA800-XLR has eight mic preamps in a single rackspace unit with XLR I/O. Each low-noise preamp includes selection of Level, Hi or Lo Gain, Phase Reverse and Low Cut filter as well as LED readouts of signal presence and signal clipping. Four models are available, priced from \$949 to \$1,249.

The MLA-XLR features eight line amps in a 1 RU unit with XLR I/O; switching output level meter; and internal switches for input summing into multiple outputs. Four models with options are priced from \$799 to \$1,149.

For more information contact ATI in Pennsylvania at (215) 443-0330 or visit [www.atiaudio.com](http://www.atiaudio.com).



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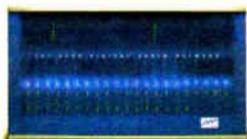
## BETWEEN THREE POINTS

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## FIRST PERSON

# Padded Table Serves Studio Purpose

by Russ Stonier-Hamnett

Most people probably would not notice it, but after spending 45 of my 65 years in broadcasting, even a small, seemingly insignificant, sound makes an instant picture in my mind.

Even today, long after programs like "Gunsmoke," the "March of Time," the "Lux Radio Theatre" and those perennial favorites, "The Lone Ranger" and "The Green Hornet" have left the air, radio still sells products using the same three tools: voice, music and sound effects.

## Swish-rustle

It was an unintended sound on a broadcast of Paul Harvey's "News and Comment" program one Saturday afternoon that put me into a different place.

The sound was the rustle of a sheet of paper as Paul turned a page. That was all — just the quick "swish-rustle" as he moved aside the page he had just read.

**There was one thing about this particular table that absolutely defined its intended use.**

But that small, unintended noise took me from my desk at home, sitting in front of my computer, to a radio studio in San Diego, about 53 years ago.

The studio was on the fifth floor of the Pickwick Hotel at Broadway and Second Avenue. The sign over the Western Electric 635 "flush ball" mic said

"KGB," one of my favorite radio stations when I was a lad of about 12.

It was a large room, probably big enough to hold a small orchestra and an

audience or stage a drama, quiz or comedy show. But by 1949 it was used mainly to deliver newscasts. I do not remember exactly what was in the room; probably the usual collection of folding chairs, mic stands and coiled cables. Perhaps a triple-turntable sound truck tucked away in a corner.

I do remember the pair of double- (or triple-) pane windows on the south wall. The larger looked into KGB's master control room, the smaller into an announce booth.

But the part of the studio which Paul Harvey's inadvertent paper rustling made most vivid was ... the table!

There was nothing particularly remarkable about the studio table. Thousands of quite similar tables might be found anywhere, in and out of broadcasting facilities. But there was one thing about this particular table that absolutely defined its intended use. It was just a table of moderate size — probably about 4 feet by 3 feet. There

See TABLE, page 40 ▶

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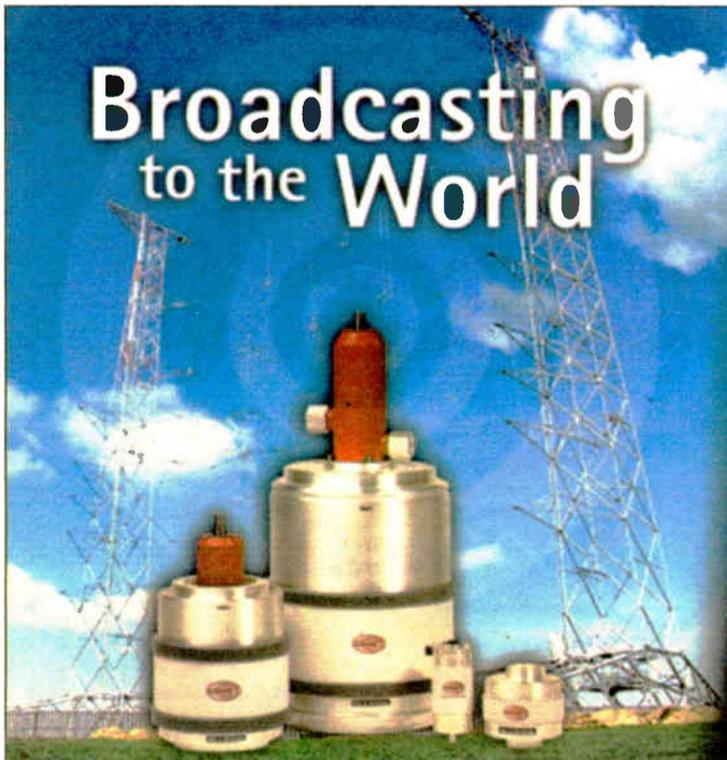
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**Radio World**

# M Audio

► Continued from page 33

woofers in the 5- to 6-inch range. The BX8 has an 8-inch polypropylene woofer that handles the mid- and low-frequency ranges quite capably. A one-inch silk-domed tweeter carries the highs. The crossover frequency is set at 1.8 kHz. A blue LED in the mounting ring of the woofer shows when power is applied to the monitor.

There are no AES/EBU or S/PDIF digital inputs to the BX8; it is strictly analog all the way.

The amplifier board, power supply, jacks and tonal contour switches are all mounted inside the rear panel. The inputs can be XLR balanced, TRS balanced or TR unbalanced at line level.

A peek at amplifier construction reveals high-quality work: Low-noise 4558 op amps in the EQ circuit, and high performance National Semiconductor 3886 monolithic ICs for the bi-amplification blocks.

Each driver element has its own 65 W amplifier, with a common volume pot regulating both. There is one generously heat-sunk 3886 for each driver. The back panel also includes a bass port for frequencies below 30 Hz.

Power is provided by a small but hearty mini-toroidal transformer, with two 35 V, 6,800 mF electrolytics keeping the amplifiers from sagging up on bass-heavy transients.

M-Audio designers had their heads screwed on straight when they built the BX8. The EQ circuit has a grounded shield plate facing the power transformer to avoid induced hum. All AC-carrying components are protected with heatshrink tubing, set with a potting compound to avoid mechanical buzzing at high SPLs.

## Tailor-made

No room anywhere is perfect, and a set of switches on the BX8 lets you tailor its response to a particular acoustic situation. A three-position Low Cutoff switch rolls off at 37, 47 or 80 Hz.

At 80 Hz, the BX8 behaves as a typical room bookshelf speaker. The lower 37 Hz setting extends bass response for more bottom. For a more conventional mix, the 47 Hz setting is proper.

The High Frequency compensation

switch dips -2 or -4 dB around 5 kHz. A Midrange switch offers up a wide lift centered around 2 kHz to add a little presence to the program material.

Lastly, an Acoustic Space switch offers compensation of the response of the monitor, depending on its placement in a room and its proximity to walls and furniture (see sidebar).

## Each BX8 is packaged with an individualized frequency response chart, evaluated and printed before leaving the factory.

This switch gently reshapes the response of the monitor by dipping the range between 500 and 900 Hz either 0, -2 or -4 dB, depending on the placement of the BX8 in the mixing space.

Select a degree of cut depending on whether the BX8s are placed on a stand, on a shelf, or on the mixer overbridge facing you.

## Check it out

My test of the BX8 monitors was done with a variety of audio sources.

These include a Hercules game-quality computer soundcard; an Earthworks SR71 microphone preamped through an Allen & Heath WZ20S audio mixer recorded to a Sony TCD-D8 DAT recorder; and a simple, inexpensive portable CD player with a line out connection.

The flat-response SR71 microphone provided the most detail. I found my voice recording most pleasing with the High Frequency compensation at -4 dB and the Midrange switch flat. Since the speakers were set on a tabletop, I also took out 4 dB on the Acoustic Space control.

As there is not a lot of very low (<80 Hz) bass energy in the male baritone voice, the Low Cutoff switch revealed nothing on my vocal recording.

The computer soundcard provided a better low-end evaluation. Using the music environment program "Reason" from Propellerhead Software, I set up a

bassline synthesizer with the low-pass filter set deep for lots of fundamental tone. With the Low Cutoff control set to roll off at the 80 Hz setting, the BX8 followed along wonderfully without the speaker cone bottoming out. At the 37 Hz setting, the increase in acoustic energy was apparent, but not grossly so.

An assortment of CDs provided the

final test. A bass-heavy recording of the "Mars" movement from Holst's "The Planets" sounded balanced and well-defined without going cloudy.

The CD of the classic '60s Perrey-Kingsley electronic album "The In Sound From Way Out," played through the BX8s, revealed something I had never heard before: ambient noise, room tone and a snuffle or two from the live musicians during recording. Very nice definition.

As much as I wanted to try out the BX8s on an audio-for-video project, my main concern was for clear reproduction of my voice for radio broadcast production. As the units are magnetically shielded and immune to the effects of nearby CRTs, I might surmise they would be just as capable in a video editing suite.

## Last note

As I stated before, there are many monitors both active and passive in this price range, and our attention tends to head toward fairly popular and well-promoted brands.

This means M Audio has to really shine to get you to notice the BX8. But if you do, you should like what you hear:

**Product Capsule:**  
**M Audio Studiophile BX8**  
**Studio Reference Monitor**

**Thumbs Up**

- ✓ Versatile performer in most studio situations
- ✓ Loud and clean
- ✓ Frequency response charted at factory
- ✓ Good construction for an under-\$600 active monitor

**Thumbs Down**

- ✓ No digital input
- ✓ Response may favor the high frequencies

Price: \$599

For information contact M-Audio in California at 626-445-2842 or visit [www.m-audio.com](http://www.m-audio.com).

fine control over the frequency contour of the monitor, plenty of clean power and a price that places it on par with other manufacturers.

One manufacturer, the mail-order giant Carvin, places an EQ switch on the front of one of its monitors to allow you to switch between accurate response and an emulation of a lesser-quality speaker.

While you certainly are free to change the settings on the back of the BX8 to do the same, it is quite a walk to get around the back and it is not always easily remembered to switch back to Normal later.

Besides, whatever you produce will be sent through the multiband compression, limiting and spectral enhancement of the air chain before it reaches a single listener. I say just set the monitors so they work for the room and let them be.

Alan Peterson coordinates imaging and coaches talk talent at WMET(AM), Washington, and teaches digital audio editing at Montgomery College, Rockville, Md. He can be reached via e-mail to [alanpeterson@earthlink.net](mailto:alanpeterson@earthlink.net).

## Spherical Sound

For those who have typically mixed with PC-type or bookshelf speakers in the past and placed them anywhere they would fit, you are not getting the entire effect. The Acoustic Space effect of the BX8 monitor compensates for speaker placement, but the concept requires some explanation.

A speaker placed in the center of a room theoretically radiates in an isotropic manner, or into what is called the *full sphere*. Mounted against a wall or on a tabletop, the dispersion is contained in a *half sphere*, since it has nowhere to go backwards or downwards. This concentrates the acoustic energy forwards and theoretically increases it by 3 dB.

Against a two-wall corner, the mode changes to *one-quarter sphere*, as two reflecting surfaces now concentrate the energy forwards. Add the ceiling to the corners and you are now down to *one-eighth sphere*.

Essentially, this means speakers in a corner sound louder, but the increase actually happens in a select frequency range and not across the speaker's entire response. The Acoustic Space switch alters the range from 500 to 900 Hz to compensate for the placement of the speaker in open space or against a wall.

The textbook we use in the audio program at Montgomery College, "Audio In Media" by Stanley R. Alten (Wadsworth/Thomson Learning, 2001), includes a superb description and diagrams on this effect. Otherwise, it is adequately explained in the notes that accompany the BX8.

— Alan R. Peterson

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# ◆ PRODUCT GUIDE ◆

## Products for Radio Air & Production Studios

Mail info and photos to: RW Product Guide, P.O. Box 1214, Falls Church, VA 22041

### Broadcast Mic Line Available From Neumann

Neumann recently rolled out the BCM 104, the first in a new broadcast line.

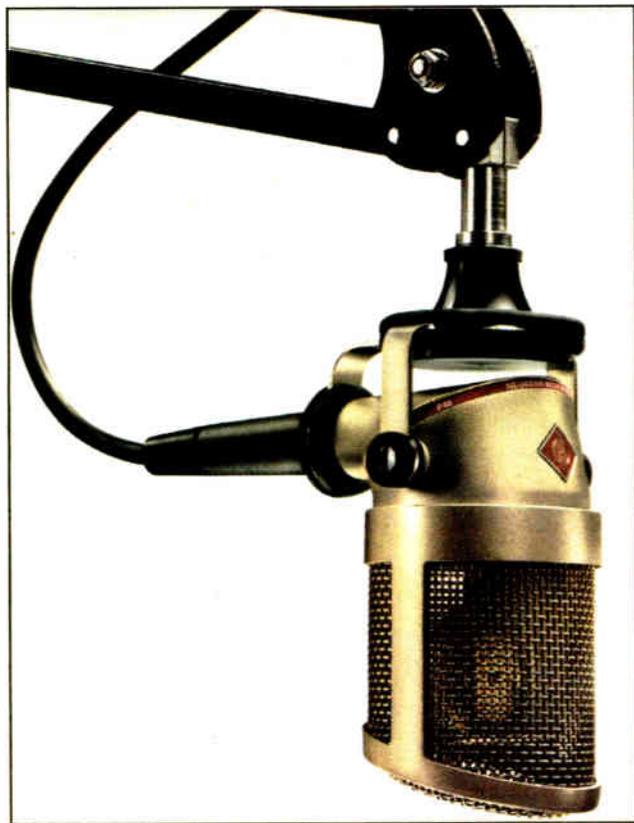
The mic is based on the circuitry in the company's TLM 103. The large-diaphragm condenser capsule used in the BCM 104 has a cardioid directional pattern with internally switchable proximity effect compensation. The design was derived from 3D simulations.

The headgrille twists off for cleaning. Optional color-coded headgrilles are available to permit each announcer his or her own headgrille if desired.

When the headgrille is removed, it is possible to view, directly in front of the capsule, mounted on a frame holder, a piece of fine gauze that serves as a built-in pop-screen.

The BCM 104 has an elastic mount to minimize noise; the mount is compatible with standard broadcast mic arms.

For more information contact Neumann USA in Connecticut at (860) 434-5220; or visit [neumlit@neumannusa.com](mailto:neumlit@neumannusa.com).



## Table

► Continued from page 38

was a reading-lamp on it and that WE635 hanging above it on a boom. A few pieces of United Press wire copy were laying on the padded green, felt top.

There are very few places where you might find a table covered with felt and also padded. A radio studio is one of them.

### Padding purposes

The padding served several purposes. That microphone, hanging over the tabletop from its boom, was there for one purpose only: to deliver a clear reproduction of the announcer or newscaster's voice.

If the voice was reflected from the tabletop up into the mic, it would arrive a fraction of a second after the direct sound from the speaker's mouth. That small reflection produces standing waves that give the voice an unnatural slightly hollow sound.

The padding minimized reflected sound. The voices were clear, firm and authoritative. That is how a radio voice should be (especially in 1949). The other purpose of the padded top was to minimize unwanted noise from a script, news copy or a dropped pencil. About a quarter-inch of foam rubber, covered by a piece of smooth, green felt that was pulled tight and secured under the lip of the table did the trick.

When radio was more concerned with quality of its live sound than we seem to be these days, you could find similar tables in studios anywhere in the country. It was a matter of pride to broadcast only the sound you intended and nothing else.

The swish-rustle a page of copy being slid to one side ... an instant picture ... a warm memory. I wonder if Paul Harvey broadcasts from a studio with a padded, felt tabletop?

Russ Stonier-Hamnet, formerly general manager of AM stations WCNZ and WVOI in Naples, Fla., is now Parish Administrator at St. Paul's Episcopal Church in Naples. Reach him at [rsh7388@swfla.rr.com](mailto:rsh7388@swfla.rr.com).

### Raised Floors Simplify Cable Management

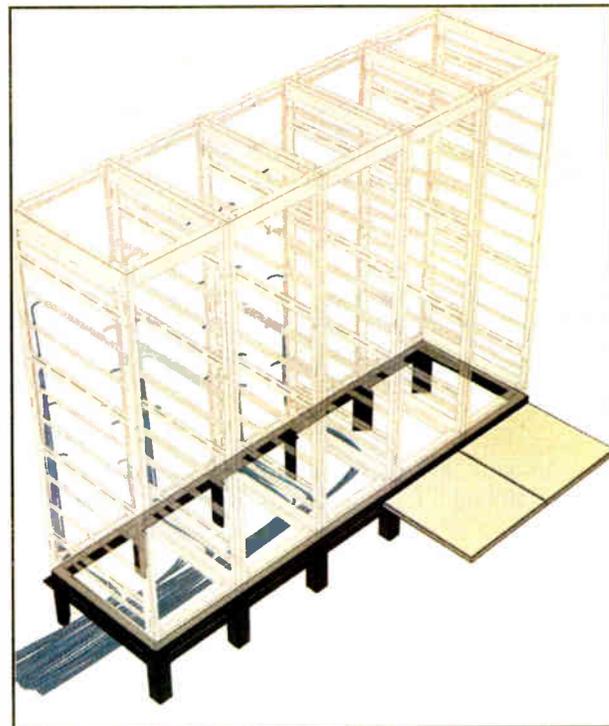
Middle Atlantic Products recently introduced a series of riser bases, raised floor riser feet and support angles to simplify the installation of equipment rack enclosures and related cable managements in raised-floor facilities.

The riser bases can be used as standalone units or in conjunction with the feet and angles to meet various needs.

RIB Series riser bases elevate equipment racks two-and-a-half feet above the floor, providing a lower cable chase between rack enclosure systems in multi-bay applications. The company's VFEET Series of riser feet can be added to a riser base to raise the base 12 inches for standard raised-floor installations, including broadcast equipment rooms and studios. Custom riser bases and feet can be ordered to meet nonstandard facilities.

Middle Atlantic Products also provides support angles that permit floor tiles to be cut to mate with the riser base and allowing the base to support the floor tiles.

For more information call Middle Atlantic Products in New Jersey at (973) 839-1976 or visit [www.middleatlantic.com](http://www.middleatlantic.com).



### Walters-Storyk Design Tapped for Redesign Of Moscow Complex

Walters-Storyk Design Group Europe was awarded the commission for the redesign and reconstruction of the GTRK Kultura Sound Recording Studio Complex in Moscow.

Studios 1 and 3 date from 1938 and Studio 5 was added in 1968. The entire national radio music archive of Russia — more than 300,000 tapes — was recorded at the studio complex.

Set to take place in three phases, the ambitious project has begun. Phase 1 targets Studio 3, which includes a V/O booth and control room. When complete, Studio 1 will be used primarily for radio drama productions, overdubbing and Foley work in existing surround-sound formats.

Phase 2, the remodeling of Studio 5-A, takes place later in the year. Studio 5-A is a hall capable of seating a live audience of 150 people. New surround-sound control rooms and a central machine room are planned.

Phase 3 will renovate Studio 1 and Control Room 1.

For more information contact the Walters-Storyk Design Group in New York at (845) 691-9300 or visit [www.wsdg.com](http://www.wsdg.com).



Pictured on Moscow's Red Square, From Left: Thomas Wenger, J+C Intersonic Electronics Engineer; Scott Yates, WSDG (USA) Partner/Chief Designer; Gabriel Hauser, WSDG-E Project Engineer; Yuri Butko and Olga Lotova of Moscow's ISPA Engineering; and Dirk Noy, WSDG-E General Manager/Project Manager

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GUEST COMMENTARY

## 5,366 Translator Filings, Four Groups

*Does This Development Serve the Public Interest, Convenience or Necessity?*

by Clarence Jones

*The author is former owner of several radio stations, engineer and ham operator, now president and general manager of WSHG(LP) in St. George, S.C.*

The FCC now has a mess on its hands. As you may know, a recent window for translator applications fielded more than 13,000 of them.

A little background, if you please.

NPR and some state broadcast associations opposed low-power FM because they were concerned that thousands of church groups would apply and knock out the ability of people in fringe reception areas to pick up NPR affiliates. Civic organizations were encouraged to apply as little NPR affiliates in some areas so competition could be held down.

Well, NPR, what do you think now about translators — 13,000 of them — being gobbled up by so-called commercial religion groups? Yes, they are non-profit, but the groups doing the programming ask for dollars from the public to continue.

NPR actually prevented locally controlled and locally originated programming by opposing LPFM.

I've read that only about 5 percent of available radio listeners actually listen to preaching radio. When you combine these stations with the 13,000 translators, this will actually drive off the other 95 percent of listeners. Makes sense to me!

And with "doomed-to-fail" IBOC doubling the amount of bandwidth stations take up, there will soon be an FM band that no one wants to listen to because of all the clutter. Someone has said the conversion of the unchurched is not the likely outcome of all this.

So who is applying and where? Here are the numbers according to the FCC translator application database and an online business source:

Radio Asset Ministry	2,454
Edgewater Broadcasting Inc.	1,766
Educational Media Foundation	875
Calvary Chapel of Twin Falls	271
Covenant Network	257
Educational Communications of Colorado Springs	165
Way FM Media Group	158
Robert J. Connelly Jr.	124
Turquoise Broadcasting Co.	118
CSN International	114
Indiana Community Radio Corp.	111
Radio Training Network	114
Big Bend Broadcasting	104
Public Broadcasting of Eastern Indiana	104
Edward A. Schober	103

Total from applicants with > 100 applications	6,838
All other applications	6,507
<b>Total applications filed</b>	<b>13,345</b>

The first four applicant groups on the list are affiliated with Calvary Chapel in Twin Falls, Idaho. Over 50 percent of the applications were filed by only 15 parties — and 5,366 of these are from four groups affiliated with Calvary Chapel.

And there are some strange goings-on in these 13,345 applicants. One of these applicants is just 12 miles from the primary station. What's wrong that residents near that translator can't receive the primary signal anyway? This is an obvious attempt to keep an LPFM out.

Another thing: nearly all of these applications from independent Christian groups are not MX, which means a station is mutually exclusive with another station — that is, one doesn't interfere with the other. Not being MX, an applicant avoids an expensive settlement hearing. Sounds like collusion to me.

Unlike LPFMs, which must protect third-adjacent facilities, these translators are sometimes allowed on third- and sometimes even second-adjacent frequencies to your local transmitter. And translators are specifically prohibited from being a locally relevant resource and from carrying locally controlled and produced music, views and news.

Again, all these translators will do is prohibit locally produced programming from being heard. Instead you will hear the same religious programming over and over going to just a 5-percent audience.

Here in South Carolina, we have a group broadcaster that has applied for translators in every market where he has owned stations. Why? Why would a broadcaster want to compete with themselves? Why, to keep the LPFM out, of course.

So what is needed here?

For one thing, the FCC needs to take a good look at how many translators one group or a similarly connected group of groups can have. LPFM can have only 10 stations (over a number of years); why not the same for translators that will cause twice the interference on the FM band as LPFM? Limit everybody to just 10.

The only reason for a translator in the first place is just to keep out the competition. FCC should take a long, hard look at some of these applicants who are filing only to block other stations from coming into their town or market.

Do the FCC, NAB, NPR and others think 13,000 translators will improve the FM band? They'd better think again. One big question about all this mess: Why did the FCC allow these translator applications before the LPFM window process runs its course? Maybe the FCC can come up with a good reason, but I doubt it. 🌐

Radio World, June 18, 2003

GUEST COMMENTARY

## Processing in the LDR Environment

*Neural Audio's Chief Scientist Delves Further Into Audio Pre-Conditioning for Encoded Digital Radio Systems*

by Robert Reams

The author is CTO, chief scientist and co-founder of Neural Audio. This is the second of two parts. For the complete version of this paper, visit [www.broadcast.harris.com/support/white\\_papers.asp?cat=78](http://www.broadcast.harris.com/support/white_papers.asp?cat=78).

The entertainment quality of even the most perfectly managed, multipath-free stereo signal may again (or further) be defeated at the consumer end by a woefully inadequate spatial environment in the home or auto.

Today, surround sound audio systems are an integral part of the home theater experience. According to the CEA, home theater is driving component audio system design; 5.1 channel surround sound is a standard feature in receivers priced as low as \$199.

The key is delivery of 5.1 channel sound. The popularity of the 5.1 channel sound is having a tremendous impact on sales of home theater components. Sales of home theater systems with 5.1 channel sound increased 230 percent in 2001 vs. 2000 and more than 987 percent during the first five months of 2002 when compared with the same period in 2001.

Auto sound is making a play for surround sound as well. Virtually all show or concept cars show some kind of surround presentation. Major automobile manufacturers are demonstrating prototypes of different surround delivery systems featuring DVD-A. Aftermarket auto sound products and installations feature DVD players with surround sound delivery. The center dashboard speaker is becoming ubiquitous in both custom installations and factory auto sound systems.

We can reasonably expect consumer adoption of a mobile surround environment to follow the same pattern, timing and ubiquity as the home theater phenomenon.

The majority of available surround sound based content appears to be mostly movies. There are few music DVD-As and some DTS-encoded albums. In fact, it appears that there is almost no popular music surround content for the consumer to play.

To make matters worse, surround releases in any genre demonstrate poor sales. The labels — those who control the production and distribution of music content — aren't impressed and are finding little reason to change from a profitable format (good ol' stereo) to an unprofitable one (surround).

So where's the disconnect between the suppliers (the music labels) and the consumer (the owners of five speakers and one subwoofer)? More importantly, what does this have to do with broadcast processing?

Consumers are pragmatists. They went to the store and bought a "home theater." The music that they hear in their movies sounds "fine."

So what's the deal? Why can't I buy the most recent release of Sugar Ray (whatever) and play it in "surround"? Why can't I hear it in front of me, behind me and to

either side of me, just like the movies?

Good question. What is it that those movie sound mixer guys have got that the music mixer guys haven't? Why can't they deliver a mix that has the depth and width of surround, not just "left and right"?

### Bridging the gap

The answer is deceptively simple. Music mixer guys *have* been mixing with width and depth all along. To hear it, you have to experience it in the same environment that they mixed it in.

As a bare minimum, you must center yourself exactly between the left and right stereo pair, no farther (or closer) from either speaker than the space between them. Even the slightest variance from this most basic rule — assuming that the speakers are precisely matched (frequency domain) and the balance is within scant fractions of a decibel — will render the precious "depth" information non-existent.

Of course this means that only one person in your living room may hear the wonders of true stereo at a time (good luck). In your car, well, *nobody* gets to hear true stereo because the stereo center is generally where the gearshift is.

Cinema engineers realized a long time ago that movies were going to be watched by (hopefully) large groups of ticket buying customers. That means that the sound image, as presented to the audience, would have to be as consistent as possible.



5.1 Spatial Environment

It also meant that this same *image would have to be consistently rendered independently of where the customer was sitting.* This is a powerful concept. We just have to find a way of broadening the listening area.

Needless to say, early movies were in mono. Various adventures into multichannel formats were successful in delivering seating independent imaging. Dialog was generally centered, music was delivered in stereo and special effects were relegated to the "effects speakers" on the sidewalls around the audience. A consistent and manufacturability format of delivery eventually won out: matrix-encoded stereo optical. The "active" or "adaptive" matrix, an ingenious predecessor to "modern" matrix decoders, eventually replaced the passive matrix.

Movies were and are specifically

matrix-encoded for playback through complementary matrix decoders. The results were consistent and predictable because the sound mixers monitored their work through matrix decoders in large theater environments, giving them an accurate presentation of what was going to happen to their content when it was played back. This resulted in consistent and enjoyable results to the consumer, and still does.

Blind decoding is a term coined to describe the act of extrapolating information from a source apart from its original intent.

A simple and recognizable form of blind decoding is playing stereo music through a

nation decoding. In addition to the stability enhancing processes, elegant watermarking may be added to provide control properties not possible even with the most advanced matrix encoder/decoder systems.

After transcoding, the music will appear to be simple unaltered music content to consumers with simple stereo systems.

### 5.1 spatial environment

A spatial environment provides a stable stereo image (complete with width and depth cues) independent of where the listener is seated. A 5.1 spatial environment accomplishes the same task with a system familiar to the consumer: Left, Center, Right, Left Surround, Right Surround and Subwoofer.

This is accomplished by specialized spatial distribution processes that utilize a



5.1 Broadcast Challenges

matrix decoder. Depending on the mixing decisions made by the artist/producer as executed by the mix engineer and the detector core/steering "style" of the matrix decoder, results are sometimes "entertaining" but mostly inconsistent, possibly annoying and invariably out of context with the artist's original intent.

combination of the transcoder stabilized stereo content and watermarking to recreate a convincing presentation of a "perfect" stereo image anywhere in the living room or auto.

Most consumers will hear the care taken by the artists, producers and engineers to construct a powerful, enveloping experience for the first time. This isn't some artificial special effect; this is the content producer's hard work, presented in a way that allows more than one person at a time to truly enjoy it.

### Oh, my back (bone)

Thanks to the stability of satellite and terrestrial digital radio transmitting and receiving, getting this experience from the broadcaster to the consumer is simply a matter of placing the predicative transcoder kernel in the existing content management processing found before the digital exciter in the broadcast chain.

Provided that the data compression is of good quality and sufficient bit-rate — it has been successfully delivered through both XM and HD Radio — the image translation and the watermarking are recovered flawlessly on the consumer side. The 5.1 spatial environment kernel easily resides in the receiver DSP (approximately 40 MIPS) and is active only when appropriate watermarking is detected.

We have briefly examined the benefits and challenges of the new digital broadcast era. Broadcast processing geared for lossy data compression has come a very long way. Real solutions that take advantage of the 5.1 spatial environment with both music and ad content exist *today*. Although the challenges were great, there is plenty of real-world experience with the technology to justify the original excitement, and then some. 🌐

## ◆ READER'S FORUM ◆

**Greaseman revisited**

In response to Dave Stewart's letter about my recent column ("Not So Funny," Reader's Forum, June 4):

Four years surely does not diminish the gravity of the moment nor the inappropriateness of the comment. But the Greaseman issue was handled quite properly in the court of public opinion. Mr. Tracht has publicly apologized numerous times for his indiscretion and paid the price. All parties that were affected by it have long since forgiven him and moved on.

My association with Mr. Tracht is well-documented, but all pertinent comments on the matter have already been stated numerous times in these pages. Anything more would be redundant. Appropriately, Radio World ran an editorial at the time condemning the ill-conceived joke and has also moved on. Evidently, the media have similarly let it go: The Greaseman show is again carried on several affiliates and Tracht has been invited onto CNN's "Crossfire" twice.

How selective our memories are: we can all name who cracked the joke, yet cannot recall a single person in the vicious group that actually committed the hateful murder.

I think the Byrd comment was cruel and wrong, yes. But it was also an unscripted quip as opposed to a long-form call-in feature or production montage that is deliberately planned and edited for hours, either of which could be aborted early in the planning stage as being too close to risking career or license.

Here, as in my column, I must condemn the joke but not necessarily the joker. Chalk it up to my "devotion and admiration" if you must, but Tracht earned both from me when he hit the road to genuinely make amends. When a fired jock sitting out his non-compete offers something more than "no comment," perhaps he will too.

Alan Peterson  
Technical Adviser to Radio World  
Springfield, Va.

**Interleaved antennas**

Some statements in Michael LeClair's article summarizing IBOC DAB presentations at the Broadcast Engineering Conference of NAB2003 (May 21, "AM IBOC, Dual Antennas Demystified") need clarification.

In his synopsis of ERI's Eric Wandel's presentation on dual-input antennas for

FM IBOC transmission, he quotes Eric as recommending caution on interleaved antennas due to the effect of the interleaved antenna on the vertical plane pattern, resulting in a less efficient antenna and reduced coverage area.

If traffic in our NAB booth was any indication, there is a lot of interest in interleaved antenna systems and how they work.

The interleaved digital bays do, indeed, affect the analog portion of the antenna, similar to the way normal parasitic elements would. However, in a properly designed interleaved antenna, it is a simple matter to adjust the phase and amplitude of the bays to prevent any adverse effect on the elevation pattern.

These techniques have been utilized for decades, and are well-known to FM and AM antenna engineers. The key is to have a radiator that is designed to accommodate these types of adjustments. Tests on interleaved antennas produced and shipped from our factory confirm that this is a viable technique.

We are confident that as the transition to HD Radio takes place, interleaved antennas will prove a popular option for both directional and omnidirectional side-mount users. Not only does a properly designed interleaved antenna require no additional aperture, it also allows for superior matching of the digital and analog azimuth and elevation patterns.

At the meeting of the NAB FM IBOC Dual Antenna Ad-hoc Technical Group in Washington recently, the FCC announced it has licensed an interleaved antenna for use as a directional antenna. The antenna is a Shively IAD model. Other Shively directional interleaved antennas are in the process of being installed and licensed.

For anyone familiar with the rigorous review process directional antennas undergo at the FCC, this should lay to rest any doubt about interleaving as a viable technique.

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**A trick of the trade**

I enjoyed the article "Development of Wire Gages" in the April 7 issue.

**The FCC Didn't Hear the Screams**

We regret the outcome of the FCC vote on media rules — its impact, its dismissal of American opinion and its hasty, secretive process.

To say that these changes are moderate is disingenuous. To argue that the FCC was forced to act by the courts is misleading. And to ignore the experience of radio consolidation in the past seven years is foolish.

We are troubled by the idea that a company could control a city's major newspaper, cable, three TV outlets and eight radio stations. We take no solace in the assurances of Rupert Murdoch and his ilk that they have no intention of taking full advantage of the changes.

We are also disgusted that radio has become the poster child for bad media — that critics now use a simple phrase to conjure their worst predictions. As Commissioner Michael Copps himself put it, "Clear Channelization" of the rest of the American media will harm our country.

And we are troubled by the strong-fisted tactics that Chairman Powell and his supporters used in the weeks leading to the vote.

Not only did the FCC take the wrong way — by only one vote — against the apparent wishes of a massive majority of Americans and of many members of Congress and interest groups, on both left and right, but it did so without allowing the public to scrutinize the proposed changes.

This would not be unusual in a typical vote, but this was hardly typical. Copps complained of information being kept from him until the last minute. In-fighting aside, many in Congress and elsewhere begged Powell to delay while the specifics could be understood, and he refused. Why?

We guess at the answer: he did so because the tide of opinion against these changes was rising fast. Although the attention of the public was only beginning to focus on this vote, the FCC was flooded by a historic number of comments, many in the final weeks. The pressure would have been unbelievable a month later. His slim majority might not have stood.

The aftertaste is unpleasant. It makes us wonder whether Powell's political motives outweigh the public good. Ironically, this could well cost his party and his president politically. What a potent issue Powell and the FCC have handed to moderate and liberal opponents of the Bush administration.

And in the background of all this debate is yet another troubling, pervasive problem.

All too often, we in the business forget that the airwaves *do* belong to the people. We talk about "our licenses" as though we own them. Rather, we are keepers in trust.

Broadcast licenses have been and remain a highly lucrative commodity, regardless of new media and competition, because licensees are sheltered from open competition in their own markets. For instance, we here at Radio World would *love* to own a radio station in New York, but we can't simply start one. You probably feel the same.

Those licensees are protected from competition from us because they operate under a model that we have all accepted since the 1930s, and for good reason. Until we figure out a way for *anyone* to start a radio or TV station who *wants* to do so, the current system holds best.

Those fortunate enough to have won a license should demonstrate a commitment to localism, diversity and competition. And most stations do. But the trend in these rule changes is away from such goals. The protections of core broadcast values slowly have been chipped away over recent decades, while the barriers to entry into the broadcast market grow higher. And frankly, our product has suffered.

Copps was right when he said, "At issue is whether a few corporations will be ceded enhanced gatekeeper control over the civil dialogue of our country; more content control over our music, entertainment and information; and veto power over the majority of what our families watch, hear and read. ... This path surrenders to a handful of corporations awesome powers over our news, information and entertainment. On this path we endanger time-honored safeguards and time-proven values that have strengthened the country as well as the media."

We fear more of the same in years to come.

— RW

Additionally, your readers can make believe they memorized the solid wire gage table by using the following simple method.

First, remember that #10 wire is very close to 1/10-inch diameter. Then, apply the "6 dB-half voltage" rule. Hence, #16 is 0.05 inches, #22 is 0.025 inches, #28 is 0.0125 inches, #34 is 0.0063, etc.

Once the wire size in question is straddled, interpolate the mid sizes (#13, #19, #25, #31, etc.) by multiplying by a 0.7 factor (i.e., #19 is 0.05 x 0.7 = 0.035). The remaining two straddled wire sizes can

either be mentally estimated or calculated by multiplying by 0.8 or 0.8 respectively. This method also works in the large wire size direction. The results will be only 2 or 3 percent lower than exact.

This trick was taught to me by Harold A. Wheeler, originator of the reactance chart and the inventor of automatic volume control.

Bob Puttre  
Retired, NYNEX (Verizon)  
Baldwin, N.Y.

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