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Is This Thing Even Workable?

The FCC hears more indignant comments about HD Radio, AM and the codec issue.

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Big Apple, Encoded

Digital radio and surround will dominate broadcast events at AES.

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Radio World

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NEWS MAKER

Dan Mason: Try Bold HD Radio Formats

POOLESVILLE, Md. Dan Mason has managed some of the largest radio groups in the country in his 30-year radio career. He was an executive with several group owners, including Infinity Radio, CBS Radio and Group W Radio at Westinghouse Broadcasting.

The former president of CBS Radio, later renamed Infinity Radio, is now a consultant to several radio broadcasting companies.

Mason became a consultant to Ibiquity Digital for its HD Radio rollout in 2003. The 54-year-old has been involved with terrestrial radio's digital technology for about 12 years; two of his former employers, Group W and CBS, were among the early investors in the technology.

He consults with Ibiquity management in promoting the value of IBOC technology and building broader relationships with broadcasters to drive the rollout. In presentations to cluster and group executives with Ibiquity Broadcast Strategic Marketing Manager Don Kelly, Mason talks about the evolution of the technology and potential

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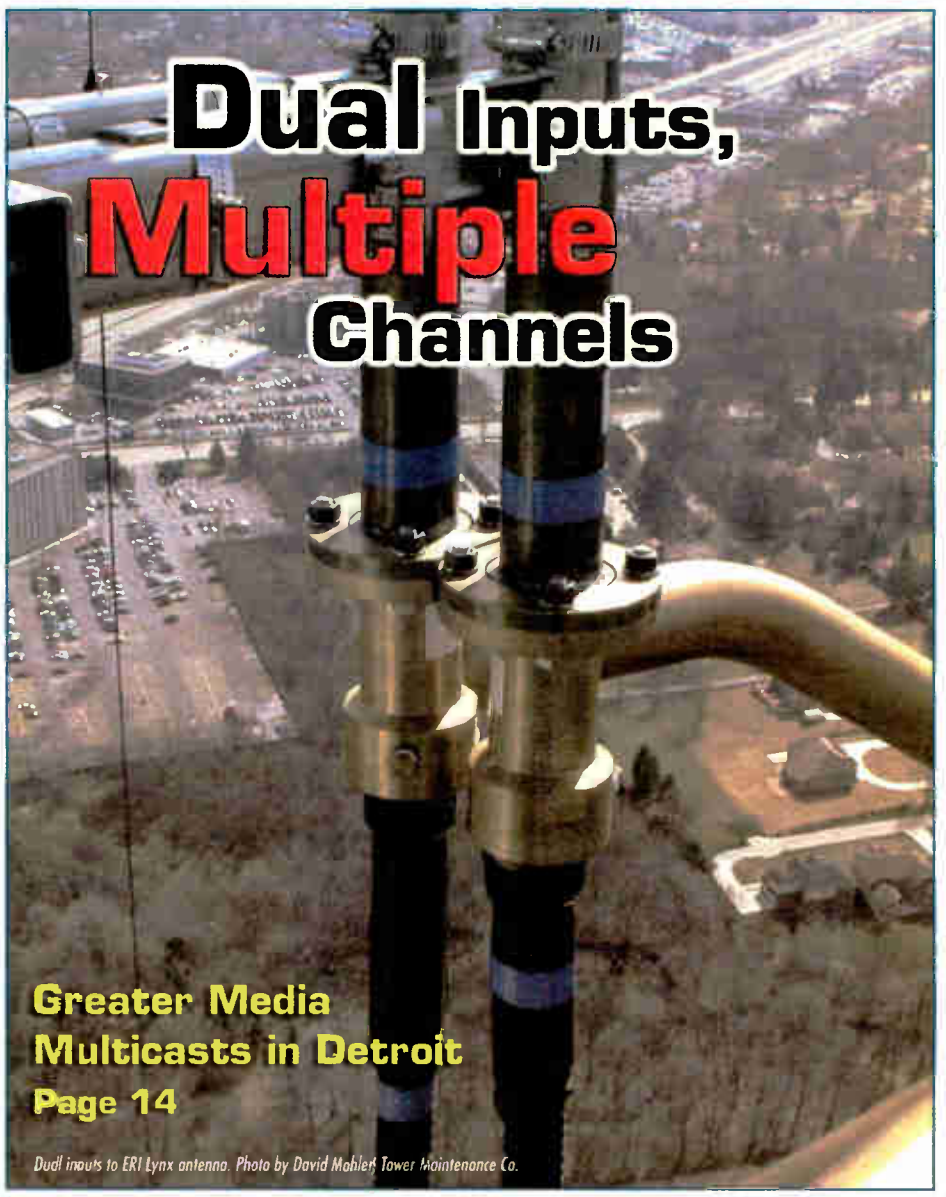

Dual inputs to ERI Lynx antenna. Photo by David Mahler, Tower Maintenance Co.

World Radio History

Gulf Stations Help Each Other

by Randy J. Stine

NEW ORLEANS While broadcasters nationwide continue relief efforts to aid victims of Hurricane Katrina, stations along the Gulf Coast from the Big Easy to the Florida coastline struggled to recover in the days and weeks after. Hurricane preparedness strategies appear to have helped coastline stations cope with one of this country's worst natural disasters.

Rebuilding plans will be necessary for stations in markets such as New Orleans, Mobile, Ala., and Biloxi, Miss. Clear Channel Radio, Cumulus Broadcasting and Entercom Communications were among the groups significantly affected. Countless other licensees absorbed damage.

Communication with stations in the impacted areas immediately following Katrina was difficult and at times limited to e-mail due to spotty landline phone and cellular service, according to the engineering heads of these radio groups. Some broadcasters shipped in satellite phones to communicate with CEs in the field.

"Devastating," said Steve Davis, senior vice president of engineering for Clear Channel Radio. He commanded recovery efforts for Clear Channel's stations from his office in Tulsa, Okla.

Stations benefited by knowing that the hurricane was approaching. Clear Channel had ordered stations along the coastline to top off generator fuel tanks; it positioned fuel trucks at several locations just outside the expected hurricane strike zone prior to landfall.

Backups

"We backed up traffic and music systems in case we lost servers, which we did," Davis said. "We also planned how to originate news from Baton Rouge if we lost New Orleans. We used Mobile as the staging area for satellite dishes, backup generators and diesel fuel."

Davis said he had direct communications with approximately 40 Clear Channel stations that were affected operationally. Damage ranged from tower collapses and power outages to studio evacuations.

"We lost a 1,000-foot FM tower in Hattiesburg (Miss.) and immediately shipped our corporate emergency FM transmission van to that market," he said. "The truck is a fully-equipped FM transmitter site with transmitter and antenna. We had to use a helicopter to evacuate several staffers from our New Orleans facility. I've never seen anything like it."

Some Clear Channel stations along the coastline were told to cut back on auxiliary power to conserve generator fuel, Davis said, and stations were "just running news and hurricane information 24/7. Our stations turned into emergency public information sites."

Clear Channel evacuated staffers from its New Orleans cluster, which includes two AMs and five FMs, and carried programming the first few days from sister WJBO(AM) in Baton Rouge. In some cases, Clear Channel used the satellite capabilities of Louisiana Radio Network to ship emergency programming to Ku dishes at various transmitter sites, Davis said.

"We also fed programming from Baton Rouge via ISDN to Premiere Radio Networks for them to uplink it for us. One of the major problems was losing the WAN when the phones went down. Except for the satellite phones, it was hard to communicate with people," Davis said. Premiere is a subsidiary of Clear Channel.

Clear Channel uses a Hurricane Response Team listserv as an additional means of communication with CEs, Davis said.

'United Broadcasters'

Clear Channel and Entercom combined efforts within days of the disaster to launch "United Radio Broadcasters of New

See KATRINA, page 3 ▶

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World Radio History

Good Digital Deal ... or a Deal Breaker?

Comments Fly on Digital Radio Standard And What Critics Have Said About It

This is a sampling of reply comments to the FCC regarding the IBOC digital broadcasting standard. These followed initial comments, excerpted here in earlier issues.

The NRSC In-Band/On-Channel (IBOC) Digital Broadcasting Standard, NRSC-5, was submitted to the commission on May 18, 2005 for consideration as it develops technical rules for IBOC operation of both AM and FM stations in the United States. The undersigned all played a major role in developing this standard. ...

For reasons clearly noted within the standard, it does not contain audio coding and compression specifications.

Early in the development of this standard, Ibiquity informed the NRSC that, due to nondisclosure agreements with partners that participated in the development of the HDC codec, it would not be possible to provide the NRSC with the specific details necessary for inclusion in the standard. Consequently, at the Feb. 17, 2004 meeting of its IBOC Standards Development Working Group (ISDWG), the NRSC faced squarely the two possible alternatives resulting from this situation — either develop a standard without the inclusion of a codec or develop *no* standard at all.

If the commission is to remand this standard back to the NRSC for inclusion of the HDC codec, it is the firm belief of the undersigned that there will be *no* NRSC standard for IBOC.

— Charles T. Morgan, Milford K. Smith Jr. and Andy Laird

Of the 23 companies and organizations represented at this meeting, there was a consensus to move forward with the development of a standard that would *not* include a codec. The minutes of that meeting show that Microsoft, Broadcast Signal Labs and Impulse Radio were all part of this consensus. Jonathan Hardis, participating in the work of the ISDWG as the representative of the National Institute of Standards and Technology (NIST), stated that it was his desire to not express an opinion on this point. ...

The NRSC has specific procedures for soliciting and reviewing comments prior to a vote on a standard. During the comment cycle preceding adoption of NRSC-5, the request for inclusion of the HDC codec was again raised and addressed in accordance with these provisions and again rejected by consensus of the group.

If the commission is to remand this standard back to the NRSC for inclusion of the HDC codec, it is the firm belief of the undersigned that there will be *no* NRSC standard for IBOC.

The concept of a "codec identifier" designed to allow IBOC receivers to recognize the specific audio codec being used for a specific transmission was first brought to the attention of the NRSC in March, 2005. The present standard does not specify a particular audio codec and is meant to be "codec agnostic," but it does not include a specific mechanism for distinguishing between different codecs, and there is general agreement within the ISDWG that a method for identifying codecs would be desirable.

Unfortunately, this concept was brought forth only a few weeks before the completed draft standard was to be sent out for comment and as such there was no time for it to be properly researched and incorporated into the standard. The potential of including of codec identifier is presently being studied within the ISDWG and will be addressed by the NRSC in the near future. ...

Section 5.3 of the standard ... states that "Advanced Data Services will be incorporated into the standard and more fully detailed in additional reference documents at a later date." A draft version ... was completed and distributed to the DAB Subcommittee for comment on Aug. 8, 2005. At the conclusion of the comment resolution process, the finalized version will be presented to the Subcommittee for final adoption. There appears to be no dissension within the working group concerning this amendment to the Standard and its adoption is anticipated within 60 days. Consequently

See NRSC-5, page 6 ▶

Katrina

▶ Continued from page 2

Orleans" as a means to reach listeners left behind in New Orleans. The entity created programming for approximately 15 New Orleans stations using programming from Entercom's WWL(AM). It was based at Clear Channel's facility in Baton Rouge, approximately 80 miles from New Orleans.

"Clear Channel had several studios that they were just finishing up not far from the Louisiana Radio Network's facility. We used ISDN to get to the LRN uplink center to put our programming up on satellite," said Marty Hadfield, vice president of engineering for Entercom, who coordinated recovery efforts for the group's New Orleans stations from Seattle.

"We used a non-penetrating assembly for a C-band dish mounted at the Jefferson Parish Emergency Operations Center for a downlink site," he said. "That's only a couple of miles from the WWL transmitter site. From the emergency center we used a 950 MHz microwave link out to the WWL transmitter site to put it on the air."

Entercom was simulcasting emergency information on all six of its New Orleans radio stations, Hadfield said.

"Our main downtown building had all of the windows blown out and the studios were all dead except for two internal hardened studios we built specifically for this type of event. We ran them on a natural gas generator for at least the first five days," Hadfield said.

He predicted it would be "months and months" before operations along the Gulf Coast would return to normal for most broadcasters.

Gary Kline, corporate director of engineering for Cumulus Broadcasting, said the group's six Mobile, Ala., stations were all "off the air for various lengths of time" because of power outages.

"The power grid was very unstable. Our tower sites did OK with generator power. We did suffer some transmitter damage at WAVH(FM) ... probably from the power surges," Kline said. WAVH remained off the air a week after the storm.

Kline said Cumulus' experience during Hurricane Ivan, which struck the Mobile area in September 2004, left his stations better prepared.

"Left over from Ivan we had two single-bay antennas mounted on our 150-foot STL tower and two Harris 1 kW solid-state frequency agile transmitters in our rack room. We broadcast several of our stations on the STL tower ... enough to cover downtown anyway," Kline said.

Cumulus also suffered minor damage to its stations in Columbus-Starkville, Miss., and Pensacola, Fla., Kline said.

The broadcast community responded broadly to help. Immediately after the storm the FCC stayed open through the Labor Day weekend, and suspended some rules to make it easier for stations to get back on the air, help each other and share resources. Numerous broadcasters moved to raise money for the storm victims. NAB spearheaded an effort to raise a minimum of $100 million and started it with a $1 million donation to the American Red Cross. Sept. 9 was declared "BroadcastUnity Day" for stations to devote air time for fundraising messages.

NAB asked members to donate equipment to radio and TV stations hurt by the hurricane. Suppliers offered equipment or set aside portions of proceeds for hurricane relief. The SBE sought to act as a clearinghouse, putting those who could offer help in touch with those who needed it.

Correction:

Michael Kernen, chief engineer for Greater Media Detroit, was incorrectly identifed as Mark in the Sept. 1 issue, page 12.

World Radio History

Radio: There When the Levee Broke

From the Editor

Paul J. McLane

I am grateful to those who toiled through Katrina and its aftermath to keep stations on the air serving the public in a time of unprecedented need.

The tragic events in the south remind us of the importance of reliable, local, informed broadcasters to our society.

Reading and watching the news from Louisiana, Mississippi and surrounding states, I found myself recalling the many times I've heard experts stress preparedness for stations. How many opinion pieces have we written urging managers to prepare disaster plans? How many seminars and panels has the NAB sponsored to help stations prepare? How often did the topics of generators, food supplies and evacuation plans come up after 9/11?

Watching the Katrina news, I recalled a photo that Joseph Pollet had sent me last spring for publication in Radio World's NAB convention preview issue. Pollet, DOE for Entercom's New Orleans cluster, spoke in April in Las Vegas on "Hurricane Preparedness in a City Below Sea Level," unaware that his station's plan soon would be pressed into use.

The aftermath of a 1947 hurricane on WWL's transmitter site. DOE Joe Pollet included this picture in his presentation at last spring's NAB.

ABC News Radio Correspondent Alex Stone reports near New Orleans after Katrina. He and engineer Kevin Rider later joined correspondent Jim Ryan for reports from downtown.

"Since the Southeast was hit hard during last hurricane season, owners and managers are likely to sit up and take notice of the morning sessions," we wrote in March about storms of 2004. "Pollet is scheduled to discuss general planning and the resultant specific checklists that went into the development and evaluation of the WWL Radio hurricane operating plan and its ongoing effect on the station's news, programming and engineering departments."

Well, Pollet and his colleagues must practice what they preached. Here's another excerpt, this from a Newhouse News Service article in the Houston Chronicle Sept. 4:

"Call it the talk show from the end of the world. WWL(AM) 870, New Orleans' oldest and most powerful radio station, has continued to broadcast since Hurricane Katrina struck. With a collapsed telephone system, no power and several television stations off the air, 'The Big 870' has tossed an information lifeline to a drowning city.

"The broadcasts are a stunning mix of interviews with officials, many of whom say it's their only way to plead for help from the outside world, plus call-ins from desperate residents, and long soliloquies from exhausted anchors pondering what future, if any, New Orleans may have," the article reported.

"'The best communication we have is this radio station,' said Phil Capitano, the mayor of Kenner, La., during an interview Wednesday on the station."

How's that for serving the public necessity?

WWL's good work earned headlines; and its reach and content were substantially enhanced by other broadcasters, as reported in Randy Stine's story on page 2. But *many* professionals stepped up: engineers who kept stations on the air, managers who allowed staff to share with competitors, news people who worked around the clock, FCC staff who opened their doors late and relaxed rules, suppliers who offered assistance, the NAB, which took a lead role in raising money, the CEOs at Clear Channel and Entercom pooling efforts, and many others who will never receive proper appreciation.

Thank you.

★ ★ ★

Buc Fitch writes in this issue about compliance; his article reinforces what David Solomon wrote in RW recently.

So much of this seems to me to be common sense. But apparently it isn't all *that* common.

Buc wrote to me: "You might make mention that many of the Notices of Apparent Liability issued in the last few years could have been addressed without a negative finding, or ameliorated by an assessment reduction, if the correspondence from the FCC was routed to the officers of the company for immediate response — or if that response had been precise, timely and with the proper contrite tone."

Can you say "Duh"?

"Any correspondence or communication from the FCC at any level should be routed immediately to an officer of the company," Fitch continued. "Broadcasters should treat these like the White House treats nuclear threats."

Fitch cites a case in which a broadcaster "opened themselves to a huge fine on a company level because they sent an FCC communication concerning high RF levels in a general public area to a *part-timer*, who was not given the time or authority to deal with the issue.

"No reply was sent — and that really irritates the FCC."

★ ★ ★

The number of HD Radio stations on the air passed 500 in August. Twenty-four FM stations were multicasting.

The impact of digital continues to be contentious. We're interested in hearing about your experiences with interference, good or bad, as a station engineer and as a radio consumer. Write to us at *radioworld@imaspub.com*.

World Radio History

GUEST COMMENTARY

Surround Is Part Entertainment

by Alan Kraemer

The author is chief technology officer of SRS Labs Inc.

For all the debate over surround for HD Radio, and radio in general, we may be losing sight of what we are trying to accomplish here.

From the broadcasters' point of view, we are trying to bring some excitement back to a medium that hasn't really had any innovation since FM stereo in the early 1960s. But ultimately we are in the business of entertaining people — real people, in real environments who listen to all of their speakers at once. People who have started to appreciate surround in the home, but have been stuck for the past 30 years listening to dual stereo in their cars.

So what does it take to entertain? Well, I don't think separation is the answer. From an engineering point of view, it is all very simple to believe that 5.1 truly discrete channels (or more) is the ideal. Unfortunately, people don't experience auditory reality through 5.1 (or 6.1 or 10.2) speakers arrayed around their heads.

Our current discrete surround systems simply provide a rather poor simulation of reality by surrounding people with boxes. It might be fun to hear something coming from the rear speakers, but you are always aware that the sound is coming from a box. This situation, and the fact that the playback environment is quite different from the performance or mixing environment, makes any concept of absolute "audio integrity" somewhat suspect.

Automotive head unit manufacturers are planning to implement matrix surround systems for the foreseeable future, the author says.

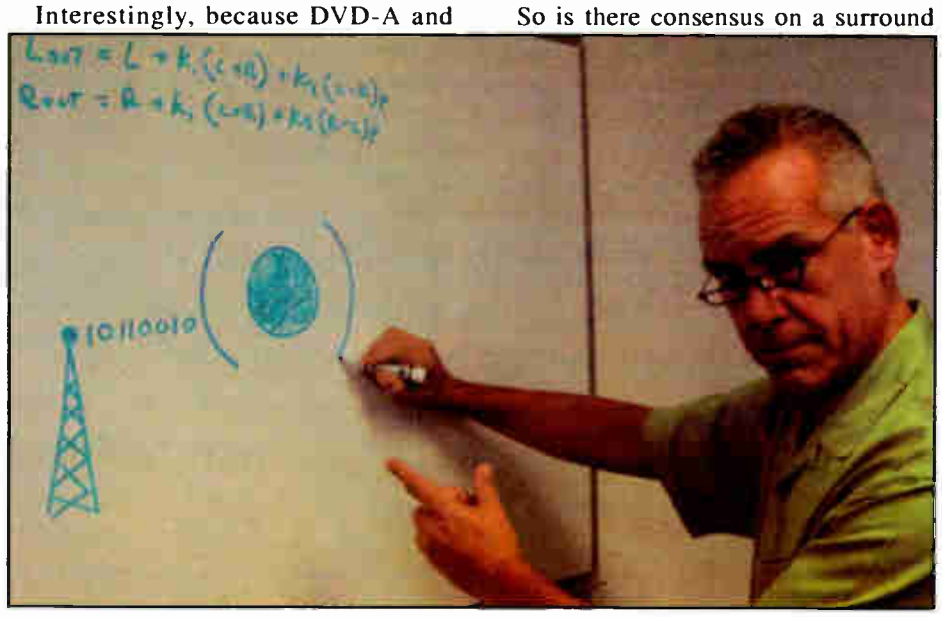
Emotional component

The true goal of any entertainment experience is to create emotional involvement. It doesn't take surround to do this; some works are so powerful that listening to them on an acoustic phonograph can move people. But surround can help, especially if the surround system can convince the listener that he or she is truly immersed in the acoustic environment of the original performance.

To me, the real goal of an audio reproduction system is to bring the listener as close as possible to, or beyond, the emotional intensity of a live performance. Whatever system can achieve this goal — discrete, matrix or spatial coding — can be deemed successful, technical differences notwithstanding.

Back to surround radio: What is the value proposition? For the broadcaster it is largely marketing. Surround brings radio on a par with what more and more consumers are expecting from their media sources, since DVDs are now virtually ubiquitous and surround can be heard in every movie theater in major markets.

Interestingly, because DVD-A and SACD are pretty much non-starters, surround radio has a window of opportunity to become *the* major source of surround-encoded content to the automotive listener. This content need not be limited to pre-recorded material. With radio, original and live productions can be brought to the listener in surround, as is commonly done with Circle Surround encoding in Japan.



The author, who jokingly calls himself 'Professor' Kraemer when lecturing on surround, demonstrates the transmission of the signal encoded with SRS Circle Surround Sound, depicted with zeroes and ones and the logo for the technology.

For the CE manufacturer, especially in the automotive market, surround provides a way to distinguish their product from the competition and to provide a new and exciting feature for the consumer. But the range of surround material appropriate to the car is limited.

In addition, consumers generally already have large existing libraries of stereo material, either on CDs or most recently on their digital audio players. This makes blind up-mixing an absolutely critical feature. Without this, surround has limited value in the car.

Post processing

In the automotive environment, post processing can create an exciting immersive auditory experience by compensating for inherent limitations on speaker and listener placement, and by taking full advantage of the resources, such as deck-mounted rear speakers, that are available. In the home, post processing can enhance the perception of dialog and improve the perceived bass performance of the system, all in the name of providing a more exciting entertainment experience. These types of post processing features add significantly to the value proposition for the CE manufacturer and can propel the adoption of technologies that incorporate them.

So is there consensus on a surround approach anywhere? Recently, in SRS discussions with major automotive and head unit manufacturers, one seems to be emerging. Based on value, simplicity and functionality, these groups are clearly saying that, for the car, for the foreseeable future, they are planning to implement matrix surround systems.

This has been demonstrated by recent Circle Surround implementations by Panasonic, Kenwood, Fujitsu Ten, Eclipse, Toyota and Honda with more to come. Dolby and Harman-based matrix surround systems are also available on a number of platforms.

So it seems the CE and automotive markets have made their decision. The decoders that will be in the hands of the consumer will be matrix-based, at least for the next few years.

That does not preclude the introduction of other surround encode/decode systems in the future, especially since accommodations are being made in the HD Radio bit stream to identify the surround format. This problem was solved long ago in A/V receivers.

The digital bit stream is decoded by the receiver DSP to determine the appropriate decoder to use, be it Dolby Digital, DTS or a matrix decoder or straight Pulse Code Modulation, which is standard uncompressed, unencoded stereo or Lt/Rt (matrix surround encoded) digital audio.

There is no reason this approach could not be applied to and improved upon by HD Radio.

So at least for now, if you want a straightforward surround encoding system that can fit easily into the production workflow, and you want the highest probability of your listeners hearing a surround broadcast in surround, a matrix-based encoding system provides excellent marketing and technical value for today's market.

RW welcomes other points of view.

World Radio History

NRSC-5

▶ Continued from page 3

the request for remanding the standard back to the NRSC for inclusion of this amendment seems to at this point be moot.

The comments of Impulses Radio concerning the processes of the NRSC in the development of NRSC-5, in the view of these three very active participants in all phases of the development of this standard, are incorrect and appear to be misplaced.

Charles T. Morgan
Milford K. Smith Jr.
Andy Laird
National Radio Systems Committee

I ... anticipate a number of reply comments to the effect: who am *I*, a single individual, to question the collective wisdom, judgment and vote of the NRSC?

However, in the present matter, the NRSC has so widely missed the mark, so clearly delivered a document that met neither its own nor this proceeding's goals, that the average person can review this one on substance too.

- Ibiquity promised us a technical standard containing all essential elements, specifically citing the codec as one of the three most important essential elements.
- NRSC-5 lacks a codec, an essential element that is required to make receivers compatible with transmitters.
- NRSC-5 does not ensure seamless compatibility between transmitters and receivers, the fundamental purpose of the standard.
- NRSC-5 does not provide a single U.S. digital broadcasting specification, enabling all receivers to receive programming from all radio stations anywhere in the country.
- NRSC-5 is not sufficiently complete to allow skilled engineers to design products compatible with those of Ibiquity.

IBOC may look like a great business model for the investors but, pardon my language, we the AM operators of the nation are being screwed.

— Larry Langford

- NRSC-5 does not lead to lower costs or increased choices for consumers.

The bottom line is that, in this case, it does not matter if the process was perfect or defective. The process is secondary. It is the result that matters, and the result — NRSC-5 — is useless for its intended purposes in its present form.

Jonathan E. Hardis

We the medium- and low-power American AM broadcasters should not be made to continue to have a back seat just because some corporation backed by some of the nation's largest broadcast companies wishes to continue down a road that is plagued by serious potholes and technical problems. Those at the design table for AM IBOC knew at the onset that the possibility existed for serious interference from digital "hiss."

Early promotion of the Ibiquity system hailed it as putting AM and FM on equal footing. Can we now agree that we were looking through rose-colored glasses? With the vast number of AM stations in this nation that will suffer and face almost certain death with this new IBOC system, I say it is not worth it.

It is also unheard of to have the government back a system that never faces any real competition and charges what it feels is correct for the licensing of the product. It may look like a great business model for the investors but, pardon my language, we the AM operators of the nation are being screwed.

pay the fees being charged by Ibiquity? This cannot be happening.

Larry Langford
WGTO(AM)

We ... recognize the great responsibility the FCC will have in deciding "if and when" to adopt NRSC-5 as it now stands, or as it may be modified. We say this because there are large differences in the suggestions given in the comments to the Public Notice, ranging (a) from rapid adoption of the draft standard to (b) never permit digital modulation in the AM and FM broadcasting bands. These range from the thought-provoking response from Mr. Jonathan Hardis, to the comments by the Ibiquity Corp. and major broadcasting station owners, through to denunciations of the entire system concept. ...

In short NRSC-5 does not describe the audio codec (called HDC in normative references) to a degree of detail that should be present in a standard.

This ... induced discussion of how other audio codecs might be permitted into the IBOC standard. Work is still ongoing within the NRSC to see how this might be accomplished. However, to repeat, this fundamental part of a transmit/over the air/reception system is missing in NRSC-5.

Despite the lack of a standardized audio codec in NRSC-5, and upon review of all the comments and the background of the deliberations of the NRSC's DAB Subcommittee standardization working group, DRM does not suggest any specif-

"Who's on First?"

— Lou Costello to Bud Abbott debuting before a national radio audience on the Kate Smith Radio Hour. February, 1938

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There is some possibility that Ibiquity IBOC will not destroy nighttime AM service.

— Leonard Kahn

It would be a bold move for the FCC to reject the Ibiquity system as unworkable and propose using spectrum for a new digital service that would allow existing AM and FM stations to use digital technology not hindered by serious issues of existing analog compatibility and interference. ...

New spectrum for AM and FM digital is the right way to go. Or at the very least let's debate it and give it more study. The current IBOC backers are doing all they can from a lobbying standpoint to tell us that the bad is not so bad and that this is really the only way to go faults and all. ...

The FCC should order the use of IBOC AM stopped at once. Many stations have numerous complaints and engineering documentation (proving) that current IBOC operation causes extreme interference to analog operation. If this interference were coming from anything but IBOC, the FCC would have ordered a shutdown of the offending station pending resolution of the problem.

Why is IBOC different? To the average listener, noise is noise! Are we the small AM broadcasters supposed to sit back and allow years of diminished service until we can afford to convert and

ic timing sequence for NRSC-5.

As pointed out in the Microsoft/Impulse/Broadcast Signal Lab comments ... "the Commission should remand NRSC-5 to the NRSC with reply comments of DRM on NRSC-5 instructions to complete the standard by incorporating both an initial codec and a mechanism that enables the use of alternative, optional codecs." From an engineering standpoint it should not be difficult to incorporate this 'switching function' into the design of a complete IBOC system.

Therefore, DRM urges the commission to note this to the NRSC.

We are not suggesting that the NRSC-5 not go forward as now written if the commission believes this is the best way to proceed. We are suggesting that the commission take the proper actions to add alternative audio codec possibilities to a "final" IBOC standard.

For reasons of flexibility in the future, for both broadcasters and radio listeners, it will be advantageous to have within the U.S. IBOC standard the possibility of audio codecs that can function well at low bit rates and are "non-proprietary." Consumer receivers will then be able to decode more than one or two audio pro-

See NRSC-5, page 7 ▶

World Radio History

◆ NEWSWATCH ◆

NAB Says Ibiquity Didn't Control NRSC Process

WASHINGTON Despite its critics, the IBOC standard developed by the National Radio Systems Committee is complete, NAB argues. The association urged the FCC to incorporate NRSC-5 in its final authorization for terrestrial digital radio transmissions.

NAB also disagreed with charges that the NRSC process had been controlled by Ibiquity.

Statements that advocated reconsidering the approach for digital radio or using another band should be dismissed because the FCC has decided the issue, the trade group said in reply comments.

NAB agreed with the Consumer Electronics Association that while the lack of a specified codec isn't ideal, "it's workable."

In earlier comments, Microsoft, Impulse Radio, Broadcast Signal Lab and others said the lack of a codec was cause to send the standard back to the NRSC. But NAB said Ibiquity's or another codec can be used "without a codec identifier ... since audio codecs are self-identified by digital radios, i.e., radios built to react to a specific compression scheme will work when data using that compression scheme is delivered to the radio, and the radio will simply ignore compression schemes delivered to it for which it was not built."

Stations are not required to use Ibiquity's codec when they go digital, "contrary to the assertion of Microsoft et al.," NAB argued.

NAB also "vociferously" disagreed with charges by Impulse that the process was controlled by Ibiquity, thus giving the company an unfair competitive advantage. NAB called the process open and fair.

Interference concerns can be addressed by reducing digital power levels or other means and can be handled on a case-by-case basis, NAB said. Some stations described their experiences with IBOC interference in comments; NAB suggested the agency track these.

The FCC should "begin to characterize the interference environment nationwide as stations go on the air with IBOC with a view toward setting up interference mitigation techniques in the final rules," the association stated.

As far as AM interference concerns, the trade association believes it's important for AM IBOC to move forward with FM IBOC, so AM doesn't get left behind.

In Other News

• The FCC is now reporting low-power FM statistics along with its quarterly summary of U.S. broadcast stations. As of June 30, there were 4,759 AMs, 6,213 FM commercial, 2,585 FM NCEs, 3,906 FM translators/boosters and **498 LPFMs.** ...

• ABC Radio Networks said a **new e-business system** to track commercial airplay will be in place by next spring. It reached agreement with software developer Spot Buy Spot for a system exclusive to ABC Radio Networks. ...

• Got a good technical radio idea? NAB Broadcast Engineering Conference organizers have put out their annual **call for papers.** See *www.nabshow.com/becproposals.asp* ...

• Commercial program supplier **Jones Radio Networks** is out with programming products marketed specifically to Internet streaming and HD multicasters. "JRN clients can now receive custom programming in any genre, from mainstream formats to unique niches," it stated. NPR, Westwood One and PRI have also announced multicasting programs. ...

• **Jim Cunningham**, president and owner of Schafer Electronics in Santa Barbara, Calif., in the mid-1970s, died at age 87, according to a statement from media brokers The Exline Company.

NRSC-5

▶ Continued from page 6

grams per assigned center frequency.

H. Donald Messer
Digital Radio Mondiale

The commission has ... received engineering analysis, using widely different procedures, from a number of independent prestigious engineers, both domestic and foreign, all reaching the same conclusion: the Ibiquity system clearly violates FCC rules and causes severe destructive interference. And, most importantly, the FCC has now received a number of reports from engineers and station owners reporting that the theoretical determined interference is *real* and is being suffered wherever the Ibiquity IBOC system is on the air.

However, on the other hand, it is hard to believe that Bell Labs engineers, and certain engineers at Clear Channel, Viacom and ABC, who the undersigned has had long-term, close professional relationships with, assuming these highly-skilled individuals were not coerced, would have advised their management to go forward with nighttime operation, knowing the system would fail.

Thus, I must concede that it is possible I do not understand the true IBOC situation and I must further concede that there is some possibility that Ibiquity IBOC will not destroy nighttime AM service.

Leonard Kahn
Kahn Communications

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IN THE MIDDLE OF THE ACTION... LIVE, FROM IRAQ.

Armed with little more than two microphones and a Matrix, Ted Leitner of XPRS, The Mighty 1090, broadcast his radio talk show LIVE during morning drive from the Al Asad-Marine Base in Iraq. Leitner is facilitating on-air live communication between troops and their families back home in San Diego, as well as bringing along special guests from the San Diego sports world, including several of the San Diego Charger Girls. "Keeping the spirits of our armed forces up is what its all about," said Ted, "Nothing beats bringing a little piece of home to our troops stationed abroad. Thanks, Comrex!"

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World Radio History

Pest-Proof Your Site With Steel Wool

by John Bisset

This is the time of year to protect transmitter buildings and AM antenna tuning or coupling units from infestation by rodents. Pests can cause no end of engineering nightmares. And it's not just buildings.

Yum! Fig. 1 shows the effect of rodents' sharp teeth on cable.

Fig. 2: A simple, effective rodent gas chamber.

Fig. 3: Plug all holes and wire pass-throughs with steel wool.

John White, engineering manager for Crawford's Portland cluster, had mice in the conduit linking control cabling between his towers. Fig. 1 shows how destructive these pests can be. Those teeth are mighty sharp, and cold weather is not a time to be replacing cable in outside conduit.

John replaced the control cable, then went a step further. He bought some gopher/rat fumigating bombs. He couldn't put the bombs in the conduit because of their size and because they would burn the cable. His solution was to improvise a collection canister, seen in Fig. 2. A plastic bucket, hose and duct tape made up the collection canister. The hose was fed into the conduit and plugged with a rag. The bomb was set off, and the lid to the collection canister sealed. The gas was dispersed from the canister to the hose and through the conduit.

The process was completed by plugging each end of the conduit with a wad of steel wool, shown in Fig. 3. Steel wool is a great deterrent to all kinds of vermin, including snakes.

Save yourself the headache of cleaning up after the damage is done and follow John White's suggestion. He can be reached at *jwhite@crawfordbroadcasting.com*.

★ ★ ★

Continuing our "mystery cable" discussion of last time:

Steve Savanyu also remembers reading those Shure catalogs in the 1960s, in which the company offered accessory cables to interconnect to devices using twist-lock connectors. After a couple hours of web searching, he came up with the spec sheet for a discontinued Shure mixer, which we told you about.

Why would anyone use this, Steve asks? Talking to a Shure old-timer, he learned that hotel AV departments in the 1960s used Hubble twist lock connectors for mic inputs — ballrooms, banquet rooms, etc. — because they were "indestructible."

This was also the era when Dukane and Bogen would put male XLR connectors as mic inputs on their mixer and package amplifiers. Because they sold much of this product into schools, the male XLR inputs minimized the potential for connector vandalism by students sticking pencil tips and toothpicks into the female connectors and then breaking them off.

Steve sends thanks to Wes Boyd and his crew.

★ ★ ★

Chip Morgan of Chip Morgan Broadcast Engineering offered a different take. Based on the large plug style, the color of the zip-tie and the shiny external appearance of the cord, he says our mystery cable was a 1969 "Hum Dinger" cable, sold by Western Electrification company.

This cable was used in the early days of unbalanced solid-state amplifiers to eliminate hum and provide lightning protection. The way it works is that the chassis of the protected equipment is tied directly to the neutral wire of a 220 V twist lock outlet, or, in the case of a remote broadcast, to the 220 V outlet on a portable generator. The center conductor of the RCA plug is isolated from both legs of the 220 V circuit by a two-way spark gap located inside the large plug.

In those days, an engineer would simply plug this jumper cable into every RCA jack in the equipment until the hum stopped, then leave it there, satisfied that the system was now safe and protected from danger. The black tape that was used to re-attach the RCA plug indicates that this cable has done its job (and probably saved a life or two).

You can visit Chip's web site at *www.cmbe.com*.

★ ★ ★

Jeff Hartman, engineering project manager with Clear Channel Television here in the Northeast, add that not too long ago, it was not uncommon to see twist-lock connectors used for mic lines. Jeff's high school auditorium, circa late 1950s, was set up this way, with twist-lock receptacles

See WORKBENCH, page 10 ▶

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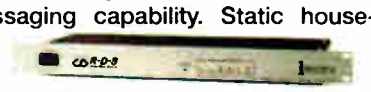

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World Radio History

Multicasting.

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World Radio History

TECH TIPS

FCC Compliance and the Station Engineer

by Charles S. Fitch

Broadcasting may not be unique in this, but it certainly presents a severe case of a regulated industry.

My view is that at least 13 layers of regulation burden broadcasting. The layers go by names like FCC, FAA, OSHA, BOCA, DOJ, Copyright Tribunal, Homeland Security, etc.

On the operating station level, engineering compliance usually is the task of the chief engineer. FCC regulatory compliance is especially challenging because the commission pragmatically regulates through four mechanisms:

Regulation: 47 CFR overall but Parts 73 and 74 specifically, nearly 1,000 pages of little tiny type;

Case law: The specific hearing and court decisions of precisely what all those regulations meant;

Policy: The emphasis placed on regulations and how the FCC feels they should enforce them;

Editorial license: "That may not be what the reg states, but this is what we meant."

Brain fade occasionally takes over at stations, especially among neophytes who think that ratings or the next 20-minute music sweep is the most important issue.

The most important issue is the station license. Without it, everybody might as well go home.

Spirit guide

In the present, permissive environment, one of the few ways your license can be challenged is if you have been found guilty of a regulatory offense. So-o-o-o-o, everyone's goal should be to avoid these. A few dollars properly spent in this effort can save hundreds of thousands as well as the gut-wrenching worry of whether you will be challenged during the long renewal periods we enjoy these days.

SECTION I: Continued

16. Y P — APPLICATIONS: Does the public file contain copies of all applications, exhibits, letters, initial and final decisions in hearing cases, and other documents pertaining to the station which were filed with the Commission and which are open for public inspection at the FCC? This includes applications granted pursuant to a waiver.
[See 73.3526(e)(2) or 73.3527(e)(2)]
Note: Applications retained in file until final action taken on the application.

17. Y P N/A — CITIZEN AGREEMENTS: For commercial stations, are copies of all citizen agreements maintained in the file for the term of the agreement? [See 73.3526(e)(3)]

18. Y P — CONTOUR MAPS: Is a copy of any service contour maps, submitted with any application tendered for filing with the FCC, together with any other information in the application showing service contours and/or main studio and transmitter location in the file? [See 73.3526(e)(4) or 73.3527(e)(3)]

19. Y P — RETENTION OF CONTOUR MAPS: Are the station's contour maps retained for as long as they reflect current, accurate information regarding the station?
[See 73.3526(e)(4) or 73.3527(e)(3)]

20. Y P N/A — OWNERSHIP REPORTS: For station licensees who are not sole proprietorships, does the public file contain copies of ownership reports and supplemental ownership reports filed with the Commission, including all exhibits, letters, and other documents associated with these filings? [See 73.3526(e)(5), 73.3527(e)(4) and 73.3615]

21. Y P N/A — OWNERSHIP INFORMATION: For non-commercial stations, does the ownership information on file with the Commission reflect the current ownership (board members, officers, etc.) of this station? [See 73.3527(e)(4) and 73.3615(d,e&f)]

22. Y P N/A — CONTRACTS: For all stations, does the public file contain either a copy of the contracts listed in the latest ownership reports or an up to date list of such contracts for as long as they are in effect?
[See 73.3526(e)(5), 73.3527(e)(4), 73.3613, 73.3615(a)(4)(i) and 73.3615(d)(3)]

23. Y P — RETENTION OF OWNERSHIP REPORTS: Are the ownership reports retained until a new, complete ownership report is filed with the FCC with a copy placed in the public inspection file? [See 73.3526(e)(5) or 73.3527(e)(4)]

24. Y P N/A — POLITICAL: Does the licensee have a complete record of all requests for broadcast time made by or on behalf of candidates for public office, together with an appropriate notation showing the disposition made by the licensee of such requests, and the charges made, if any, if the request was granted?
[See 73.1943 and either 73.3526(e)(6) or 73.3527(e)(5)]

A page from the FCC's FM Broadcast Station Checklist.

Further, no one wants to be associated with a Notice of Apparent Liability. Even the smallest infraction that happens on your watch can destroy a career.

We're professionals, so no detail is too small not to get right. Let's get down to cases.

Your "spirit guide" for compliance should be the FCC station checklist followed by its inspectors and those in the volunteer inspection program. These lists for AM and FM were updated a few years ago with little fanfare. One interesting emphasis change was a sort of helpful stream-of-consciousness narrative about many of the points made.

The centerpiece of compliance is the public file. We could fill this issue of RW with a discussion of that document so we'll limit ours to a few specific engineering items.

Paperwork

The license. Make certain you have the last full print that includes the station's facility description and the latest renewal notice. Copies of any current construction permit applications or grants should be there with the other licenses. Special night operation "permission" letters for AM stations should be included as well. A document often missing is the letter appointing the designated chief operator. Make certain it's correct as to who that person is right now. I once encountered a PF letter appointing a chief operator; that person had died a decade before.

These documents must be available at the station's main control point as well.

Coverage maps are required and should be specific, accurate and correlated to the station's public file. At the moment the Media Bureau's Web site will print you a coverage map for your FM station. I strongly suggest that in addition to those gorgeous coverage maps your consulting engineer has provided, you print and place these FCC beauties in the PF. Even the most contentious person could not argue with the commission's own determination.

Location. A few years ago, as part of the federal government's thrust to make the nation Internet-accessible, the FCC allowed stations to place public files on the Internet. The physical location of those files can be anywhere; but they must be accessible from the station's legal "studio" location.

The job of keeping the access terminal and printer — remember, copies have to be made available to all who examine the public file — probably will fall to you. If the terminal doesn't work or the files cannot be accessed by the reviewer, you don't have a public file. Keep it running, keep it connected to the file and check it often.

Organization. Whether in printed form or electronic, keep the public file neat, well organized and limited to what is required. If the reviewer cannot find what's supposed to be there, it doesn't exist.

At the site

Covering the records of your bailiwick, let's start at the transmitter.

Do your transmitters, specifically, need to be licensed? No. Do they need to be type-accepted? Yes, and you should keep a record of that acceptance as well as the proof of performance you made when the transmitter was put online, if less than two years ago, or the last two years of annual proofs.

Incidentally, for multiple reasons, you need a proof for every time you change or install a stereo generator or an SCA generator as well as when you turn on IBOC. The larger part of the present proof requirement is occupied bandwidth, so make it a habit to do an OBW

See COMPLIANCE, page 12 ▶

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Workbench

▶ Continued from page 8

on the front of the stage. These were replaced with XLR connectors in the mid-'70s immediately after a classmate plugged a Shure 55SH into a 240V receptacle in the projection room, demonstrating that microphones can generate sound, too ... for a little while, at least!

Jeff thinks our cable might have fed a phonograph or tape player into a PA system ... or maybe it's an early prototype for Monster Cable!

Jeff Hartman can be reached at *jeffhartman@clearchannel.com.*

★ ★ ★

Rick Sedlak is with the Educational Communications Center at Binghamton University. Rick worked in commercial sound for a few years and ran across this type of twist-lock plug a few times. They used the twist-lock jack for microphone jacks. So, it looks like our dead-man's cable was adapting a microphone plug to an RCA plug. Rick can be reached at *rsedlak@binghamton.edu.*

Thanks to all who commented about the mystery cable. As Steve Savanyu wrote, it was a fun foray into the roots of audio.

★ ★ ★

We're getting neat ideas for our "best circuit" contest. Have you entered? We're looking for a simple circuit to solve a problem, or modification to equipment that improves its performance. Several cool NAB techie shirts — in addition to a *Workbench* stipend — go to the best designs.

E-mail or fax your submission, with a clearly drawn schematic and parts list. Your submission will also qualify for SBE recertification credit.

John Bisset has worked as a chief engineer and contract engineer for more than 30 years. He is the northeast regional sales manager for Broadcast Electronics. Reach him at (571) 217-9386, or jbisset@bdcast.com. *Faxed submissions can be sent to (603) 472-4944. Submissions for this column are encouraged, and qualify for SBE recertification credit.*

World Radio History

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World Radio History

Compliance

▶ Continued from page 10

check whenever you change equipment, modes or configurations and make a record.

Let's talk about auxiliary transmitters. Tremendous latitude is given for staying on the air in emergencies or under duress. Our regulators expect broadcasting to come through in challenging times and so they give us the flexibility to do so. In a disaster the magnitude of the Asian tsunamis of last year, broadcasting would become our foundation of civil order, and the government wants us on the air and responding to community needs.

However there is a discipline and formality for aux facilities that must be followed. Previous main facilities can be licensed as aux easily, by filing a separate Form 302 referencing the previous license. For once, here is a procedure that is simple and a benefit to the station. A quick example is a nondirectional FM that upgrades to a directional at the same site to expand coverage. The new DA is a main and the old NDA is relicensed as an aux.

Here's where policy and case law come into the picture. When is a location a transmitter site? If your station has an antenna, line, transmitter and power all connected ready to run, the commission has spoken; it's a transmitter site. This system should be licensed.

If you have an antenna on the roof of your studio and a spare exciter in the closet, that's just advanced planning.

I'd rather have the system connected, licensed and ready. This beats swimming through the tsunami to the closet.

Colors and numbers

Make certain that you have current authorizations of auxiliary Part 74 licenses such as your STLs. Remember also that if you change power, mode, azimuth, coordinates at either end of your STL/ICRs or frequencies, you'll need a new license. With the requisite prior coordination, relicensing takes time; so if you need a new ticket, start on it today.

Brain fade occasionally takes over, especially among neophytes who think that ratings or the next 20-minute music sweep is the most important issue. The most important issue is the station license.

The largest single capital investment at many stations is the tower. If you own it, you're responsible for the lighting, marking and maintenance. If you do not own it, make absolutely certain your landlord fulfills its responsibilities religiously. This safety circumstance, if unmet, is one of the few times that by default all licenses on the tower must take action or they are to blame.

Double-check that the tower has been registered, if necessary, with the right number and that a copy of the registration certificate is in the engineering files; if the tower is yours, make sure every tenant has a copy.

Towers must be inspected every quarter. Most important, any automatic, required, light monitoring alarm system must be tested as part of this inspection. Outages of the top beacon or *any* flashing features must be reported to the FAA and a log of outages and restoration of all lighting must be maintained.

The gold standard for paint on towers are the white and international orange official paint chips. The human eye can discern more shades of red than any other color, so even a near-blind inspector can call you on this with a simple side-by-side comparison.

AM towers with hot bases must be fenced. OET-65 compliance distances must be met to prevent just plain folks from wandering into high RF fields. Remember to display the registration number of your towers at the tower. In one of those editorial license situations we mentioned, also display them at the nearest place(s) where the general public can come to the towers.

My favorite example of careful compliance is the station that posted its tower sign and numbers on the nearest point the public could come, a scenic overlook — located on the next ridge!

Do not forget that every site needs an "RF Plan" under OSHA regulations and said plan has to be reassessed and updated every year.

Mandatory signs are a sign of the times; make certain RF and other hazard signs are posted, including the pedestrian "No Trespassing." Also make sure signs are in the proper sequence as the public encounters them: Notice, Possible, Caution, Warning, Danger and Stop, in that order. If your site is close to Quebec Province, it would be wise to provide the text in French as well; if Mexico, in Espanol.

AM stations need a drawing of the antenna system with values and the latest determination of your base impedance if you measure power directly.

Indirect stations, both AM and FM, need a record of the efficiency factor and how it was determined (i.e., calorimeter, manufacture's determination, etc.)

Between the site and a hard place

If your station is fed from central origination but requires a local studio, can you readily switch to programming from that studio; and is adequate equipment operational at that local studio to originate meaningful effective programming?

How about the transmitter POTS control line? Is that line used only by the station for control and no one else? Recently at a multiple tenant site it was discovered that the burglar alarm company had grabbed the station's control line for their supervisory system connection to the outside world. This explained to the station why the line was busy so much, as automatic calls were made to open and close the gate and doors.

Is your head swimming? Yes? Good. That's why you're paid the big bucs.

The FCC checklists mentioned are at *www.fcc.gov/eb/bc-chklsts/.*

If RW readers have the interest, we'll revisit compliance and dig a little further into the topic. Write to me at *fitchpe@comcast.net.*

Charles S. Fitch, W2IPI, is a registered professional consultant engineer, member of the AFCCE, senior member of the SBE, lifetime CPBE with AMD, licensed electrical contractor, former station owner and former director of engineering of WTIC(TV) in Hartford, Conn., and WHSH(TV) in Marlborough, Mass.

Metal by Day, Metal by Night

Matt Truman

Superman had a secret identity, and so does Matt Truman.

By day he is known as a mild-mannered technical engineer in the FM antenna department of Dielectric Communications in Raymond, Maine. But by night he thrashes guitar in the heavy metal band known as Dead Season.

You could say Truman works with heavy metal by day and a different kind of heavy metal at night.

The band won the WTOS(FM) "Battle of the Bands" last year, and this August it successfully defended its title in front of an audience of 3,000 people. The station, in Augusta, allows listeners to vote on the recordings of 12 semi-finalist bands and hands $1,000 to the winner.

"We signed hundreds of autographs, sold 300 CDs and sold out of our merchandise," Truman said of this year's concert. "It was unreal."

Dead Season is Truman, his brother Ian on vocals, Martin Nadeau slamming drums and bass player Craig Chaisson. All these musicians have "day gigs" unrelated to making music.

The band's Web site is *www.deadseason.com.*

— *Ken R.*

World Radio History

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And now, Axia has a cool new modular control surface: Element. Scalable from four to forty faders, you can build the ideal surface for every studio. Element's abundant outputs and flexible architecture can be switched between stereo and surround mixing. Its info-rich user display, built-in router control, and integrated phone and codec support simplify the most complex shows. You'll never outgrow it.

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

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

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World Radio History

HD Radio News

Working Around The Delay

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Radio World | Covering Radio's Digital Transition | September 28, 2005

FIRST PERSON

Greater Media Multicasts in Detroit

by Michael Kernen

The author is group chief engineer for Greater Media Detroit, which owns FMs WCSX, WMGC and WRIF.

If the measure of an innovation's worth is its ability to become a consumer market success, Sony's MiniDisc should serve us in radio as a reminder of what not to do. As the fundamental precursor to the iPod, MD wasn't the hit it could have been. In fact, it bombed in the United States marketplace in no small part because the consumer had already bought CD players and the first generation MD didn't offer anything that the CD player hadn't already, even several years prior.

Except for its smaller size and recording ability, only available in models significantly higher in price, consumers were pressed to find a reason to buy. The lack of backward compatibility with a huge installed base of consumer CD players and the arrival of reasonably inexpensive computer-based CD burners doomed the product to also-ran status.

HD Radio cannot afford the same fate, nor do I believe such a fate to be imminent. HD Radio is 100 percent backward compatible. The technology rides alongside legacy radio broadcasting systems with no penalty or additional burden — from a consumer's standpoint.

The view from an engineer's perspective is, of course, different.

Photo: David Mohler, Tower Maintenance Co.

Part of the Lynx antenna, mounted on the tower.

The auto connection

Given Detroit's proximity to the auto industry and the need to impress and compel automotive product planners, Ibiquity Digital allowed me to cooperate with it in one of the earliest HD Radio installs in the nation.

Of the three stations under my supervision, I chose our AC station WMGC(FM) because of its broad format appeal and the transmitter site's proximity to my office. Another intriguing prospect was HD Radio's promise of multipath and interference rejection.

Greater Media Detroit Engineer Mark Trombley studies code for the Klotz audio routing system. Some code needed to be written to direct audio through the system to the HD Radio transmitters.

When we added Ibiquity's HD Radio technology — in the 2001-2002 timeframe — WMGC had been struggling to counteract the fact that our neighbor up the dial is a grandfathered superpowered station and transmits at 190 kW roughly three miles away from our 13.5 kW. The side effect was that many of our core listeners in nearby office buildings experienced de-sensing of their receivers and were unable to listen to us.

It seemed like a job for a new antenna, but also a test for new technology. HD Radio held promise.

As a short-term relatively low-cost stopgap, WMGC installed an ERI Rototiller antenna significantly lower on our tower than the 980-foot HAAT prior antenna location, allowing an increase in TPO to Class B's maximum 50 kW at 500 feet HAAT, effectively curing the receiver de-sense problem in our immediate neighborhood at the cost of some overall range — but not before HD Radio had a chance to prove itself.

During all of our listening tests, in every case, IBOC worked flawlessly. Even in areas where analog receivers refused to tune, HD Radio performed.

Implementing the Ibiquity system at that time was possible only with the addition of a high-power, solid-state transmitter, in our case a 10 kW experimental Harris unit running at 2 kW and feeding a 10 dB in-line hybrid combiner custom-fabricated by Ibiquity. That system

See GREATER MEDIA, page 16 ▶

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Radio World's HD Radio™ Scoreboard

The HD Radio Scoreboard is compiled monthly by Radio World using information supplied by iBiquity Digital Corp. and other sources.
The data shown reflect best information as of Aug. 30. This page is sponsored by Broadcast Electronics. HD Radio is a trademark of iBiquity Digital Corp.

HD RADIO IN PHILADELPHIA

Station	Freq.	Licensee	On Air	Multicasting
WIP(AM)	610	Infinity Broadcasting	Yes	No
WTMR(AM)	800	Beasley	No	No
WWDB(AM)	860	Beasley	No	No
WFEN(AM)	950	Greater Media	Yes	No
WCAS(AM)	1480	Clear Channel	Yes	No
WRTI(FM)	90.1	Temple University	No	No
WRTL(FM)	90.7	Temple University	No	No
WHYY(FM)	90.9	WHYY Inc.	No	No
WXTU(FM)	92.5	Beasley	Yes	No
WMMR(FM)	93.3	Greater Media	No	No
WMWX(FM)	95.7	Greater Media	Yes	No
WRDW(FM)	96.5	Beasley	No	No
WUSL(FM)	98.9	Clear Channel	Yes	No
WIOQ(FM)	102.1	Clear Channel	Yes	No
WMGK(FM)	102.9	Greater Media	Yes	No
WPHI(FM)	103.9	Radio One Inc.	No	No
WSNI(FM)	104.5	Clear Channel	Yes	No
WDAS(FM)	105.3	Clear Channel	Yes	No
WJJZ(FM)	106.1	Clear Channel	Yes	No

The HD Radio Bottom Line

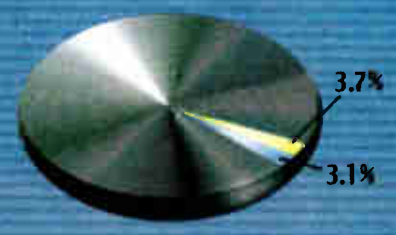
Total Licensed	On the Air
926	505

Last Month

Total Licensed	On the Air
831	429

Market Peretration
United States

13,557 AM & FM Stations
(excludes LPFMs)



Licensed by Ibiquity and on the air

Licensed by Ibiquity and not on the air

Number of FM Stations Multicasting:

24

World Radio History

Greater Media

▶ Continued from page 14

requires an enormous reject load and is less than ideal from an efficiency standpoint since 90 percent of the digital transmitter's power is lost, as is 10 percent of the analog system's. The latter requires me to charm a lofty 22 kilowatts out of a 20 kW transmitter.

Technically, it works fine and requires the least amount of infrastructure replacement. Newer methods are more efficient, but require antenna modifications if not wholesale replacement.

The dual input antenna method of HD Radio broadcasting being the most desirable, WRIF's install required antenna replacement. We chose ERI's Radio World "Cool Stuff" Award-winning Lynx Dual Input FM Antenna. Tower Maintenance Co. of Delta, Ohio, installed the Lynx.

The ERI Cogwheel antenna used on WCSX required modification, as well as the addition of a second transmission line from the transmitter all the way to the antenna's new second input. I don't have to tell you that antenna replacements and mods can be costly, disruptive, and time-consuming.

A fourth implementation, low-level combining, is possible for lower-power stations that have the wider bandwidth offered by some solid-state transmitters. This method allows the combination of digital and analog signals at a point prior to the final power amplifier.

My experience has ranged from working with and mostly watching Ibiquity's staff engineers on the WMGC installation, to independently installing WCSX and WRIF's main/alternate systems with multicasting capability this July.

Of course, installing IBOC has become much simpler than it was in the beginning.

That's not to say that the installs went in without challenges. Basic HD Radio transmitter setup is relatively straightforward, requiring only that the engineer possess fundamental knowledge of transmission systems and theory. The most challenging aspect concerned the connection of remote controls, which on our Broadcast Electronics main/alternate system proved to be a do-it-yourself engineering project.

BE provided the necessary equipment, including the FSi-10 FM HD Radio signal generator that provides baseband IBOC directly to the excellent and dead-reliable FXi60/FXi250 digital exciter that is used as a sort of HD Radio signal intermediate power amplifier.

From there, the signal flows to the FMi73/FMi106 power amp, the latter model necessary for WRIF's higher necessary TPO. BE also provided an aging but trustworthy FA-2 automatic transmitter switch and a Dow-Key 412 series coaxial switch.

The FXi 250 exciter installed at WRIF and the BE FA-2 transmitter output switch controller provide automatic failover to a redundant HD Radio signal generator, exciter and RF power amplifier.

Burk GSC3000 equipment, near the top, provides remote control capacity via touch-tone and Internet. It needed an additional I/O unit and wiring interfaces to accommodate the new HD Radio equipment. The BE FXi 250 exciter at WRIF and BE FA2 transmitter output switch controller provide automatic failover to a redundant HD Radio signal generator, exciter and RF power amplifier.

How we handled the analog audio delay may be interesting to readers. Well known to engineers at IBOC stations is the roughly 8-second delay that must be introduced to the analog audio chain in order to allow HD Radio receivers to fall back to analog seamlessly in the event that the digital is lost. While the FMi10 signal generator provides the delay, equipment elsewhere in the audio chain can handle it better.

Orban now provides this delay in its new 8500 FM audio processor that offers the ability to place the same audio processing on both analog and HD; but likely the best way to provide the delay is through Eventide's new BD600 Broadcast Profanity Delay. It offers the delay needed to precisely line up analog with digital, and also a way to ramp from 0 delay to the precise digital match and back to 0 again. This is necessary for maintenance and for stations that maintain alternate broadcast sites so that switching to and from delay can happen without the abrupt 8-second "skip" being heard on the air.

Multicast upgrade

The last challenge we undertook was splitting the HD Radio signal in two. Ibiquity's system provides for up to a three-way split of the digital data stream, giving stations the ability to "multicast." Multicasting is the killer app for HD Radio and the one that may well afford it the consumer recognition it deserves.

BE's IDi10 importer provides the capability to multicast. The product can be located at the studio or the transmitter site, provided the station has a high-speed data link to the transmission facility. We encountered some difficulty setting up the importer at the studio site even though we provided a com-

See GREATER MEDIA, page 17 ▶

World Radio History

Greater Media

▶ Continued from page 16

plete and otherwise unused T1 at both ends.

The link's inability to provide a continuous data stream caused the HD2 channel's audio to skip, but no other issues were noted. Relocation of the importer to the transmitter site cured that, but transmitter sites are not noted for their hospitality to computers (which the importer ostensibly is) and I'd much rather see the unit left in the climate-controlled and cleaner environs of the station technical operations center.

Our group is excited about the HD Radio technology and has chosen to implement HD2 channels permanently on each of our three Detroit market stations. I chose an even split of the available digital bandwidth, a 48 kHz bit rate, between the main channel digital and the HD2 channel. I found the sound quality to be acceptable and that it favorably compares with that of satellite radio.

Receivers are hitting the market and as I write this several compelling products are readying launch. HD Radio's multicast access is not standardized and differs from one implementation to another.

Our superb Yamaha receiver requires mastery of the remote to access HD2, while the HD2 channel is simply "one station up the dial" on the Kenwood. I implore all manufacturers to implement this tuning method. Also, the Yamaha won't permit storage of the HD2 channel as a preset, whereas the Kenwood does.

The digital conversions have generated not a word of complaint from an interference or reception standpoint and have not degraded or altered any of our legacy services, a real comfort for any engineer.

Receiver penetration has been light so far. I haven't received any feedback from "average" consumers. The only folks I know who personally own HD Radio-compatible receivers are industry insiders.

There are definitely two sides to the sound quality debate, though. On one side are those who would adjust the audio processing so that a difference is clearly heard when the analog cross fades to the HD signal — for "wow factor." This also opens up an opportunity to move away from the loudness wars in which many of us reluctantly participate and allow for the digital signal to sound more open and natural.

On the other side of the sound quality debate are those who believe the processing should match, so that digital dropouts — which cause a receiver to blend to the analog signal — are less objectionable.

Whichever side you're on, digital's difference is obvious, comparing with analog; the noise floor disappears and the high-frequency detail becomes more evident. Digital compression artifacts are almost inaudible, even at the 48 kilobits-per-second rate we've chosen for both our main and multicast channels.

We spent in the neighborhood of $750,000 for the conversions, including multicast ability, of three stations, with various levels of redundancy. Planning the conversions took only a matter of a few weeks. Milford Smith, vice president of radio engineering, and I designed the RF component while audio systems analyst Chris Buckland, engineers Mark Trombley, Sherri Powers and I handled the audio systems.

Programming on the multicast channels is also streamed on the Web and is provided by expanding our AudioVault system.

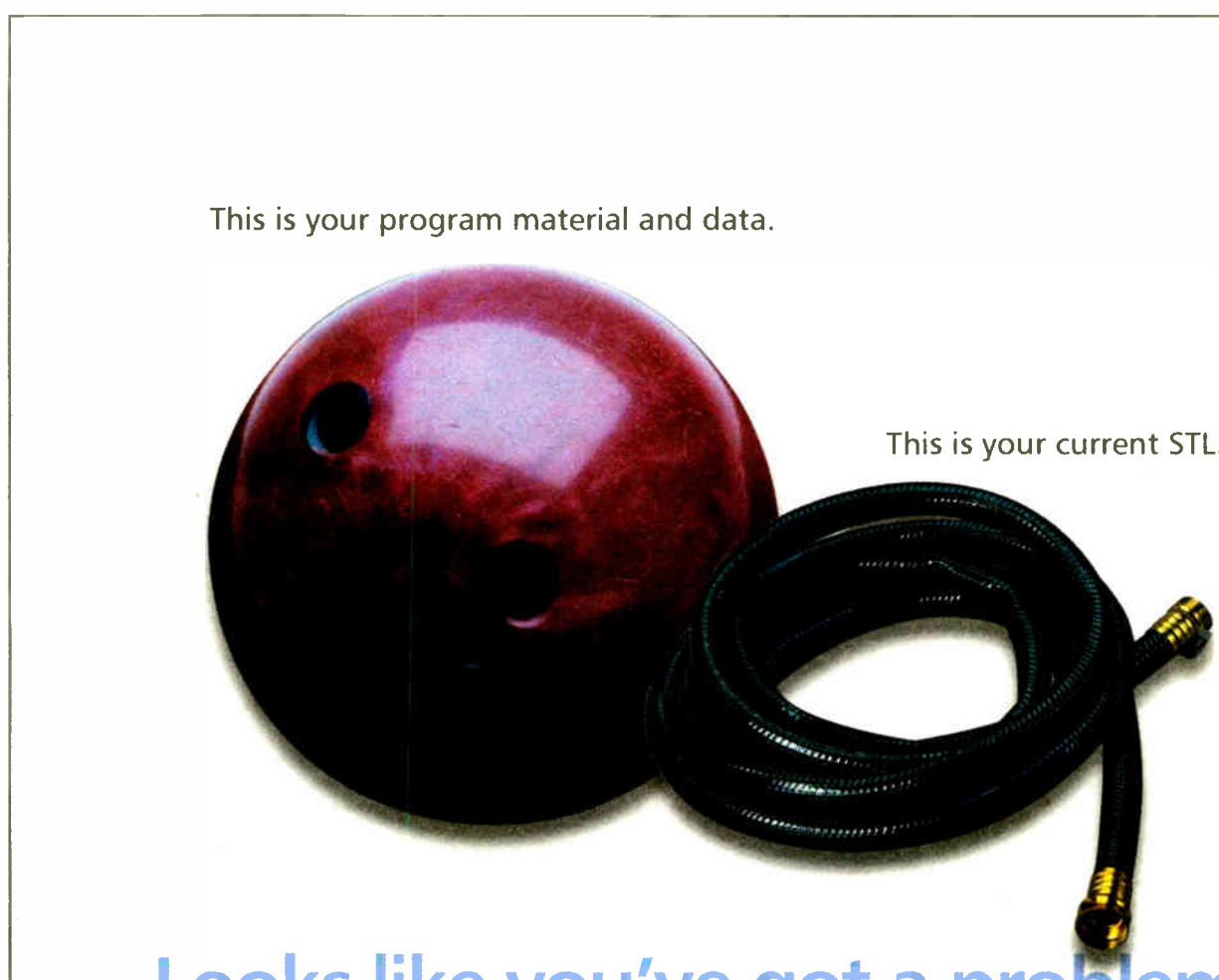
I'm looking forward to seeing what the future holds for consumer HD Radio receivers and watching for the auto manufacturers to start making IBOC available and, eventually, standard equipment. Ibiquity is working hard on making that happen; the car will likely be the place where most consumers are introduced to HD Radio and likely the hook that will lure them to purchase other IBOC-capable receivers.

Our IBOC efforts have been worthwhile. Not only is it an honor and privilege to count my stations as part of the movement toward the inevitable digital future, but also I have found HD Radio's implementation straightforward and its performance to be spectacular. Hopefully the consumer market will embrace this latest innovation as it has the CD and the iPod.

The equipment list:

The hardware — mostly new purchases — used to convert the three stations to HD Radio and multicasting:

- Broadcast Electronics FXi60 HD Radio Exciter
- BE FXi250 HD Radio Exciter
- BE IDi10 HD Radio Data Importer and Encoder
- BE FMi73 FM Transmitter
- BE FMi106 FM Transmitter
- BE FA-2 automatic transmitter switch
- FSi-10 FM HD Radio Signal Generator
- BE AudioVault Radio Automation
- Bird Dummy Load
- Burk GSC3000 Transmitter Remote Control System
- Cybertron servers
- Dow-Key 412 Series Coaxial Switch
- ERI Cogwheel FM Antenna
- ERI Lynx Dual-Input FM Antenna
- Eventide BD600 Broadcast Obscenity Delay
- Intraplex T1 Multiplexer PT353 and PR353
- Lucid Technology AES Distribution Amplifier
- Orban Optimod-FM 8500 audio processor
- Stratex Networks Velox LE wireless transmission
- Titus MDA-8 Digital and Analog Switcher Monitor
- Titus 3-DRX Digital Audio Switcher



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World Radio History

Mason

▶ Continued from page 1

sales opportunities it presents.

Radio World News Editor/Washington Bureau Chief Leslie Stimson talked with Mason about those activities.

***RW:** Don Kelly and you have told me that in your presentations you talk about the history of HD Radio and how stations can factor HD Radio into what they're doing sales-wise.*

Mason: We don't even know all the cool applications that HD Radio is going to bring … because Ibiquity is a technology company. It's not necessarily a marketing company.

The people who are really going to bring the products to the market are the radio stations, because the radio stations are the marketers. That's why it's so important to get this technology out. Because whatever comes out on Day One as far as products will look amazingly different within in a year because there's going to be many more uses of the spectrum.

Be a little brave and bold about trying new formats.

— Dan Mason

***RW:** Would stations possibly charge extra for certain ads in digital?*

Mason: I'll give you one example. Under datacasting you will be able to, on your LED screen on the radio itself, if you're running a Coke commercial you'll be able to see a flash come over your radio, "Buy Coke tonight at Safeway, 99 cents for a six-pack." Sure, that's got to be worth something. Maybe an extra 5 percent, 10 percent. What's that worth?

Or it might say, "Come in between 8 and 9 p.m. for the Blue Light Special at K-Mart." "Six Cokes for 99 cents," and you see that flash on your screen.

There's tons of datacasting applications. Some news and sports stations may choose to run a Sunday Football Scoreboard over their LED screen as part of their datacasting. Obviously, that could be sponsored. And that's regardless of what you're hearing on the radio.

***RW:** What do stations usually ask you?*

Mason: The availability of the radios. That's always the number one question.

I've think we've gone from a year ago trying to convince radio stations or radio groups that the future was digital and HD. We've made that transition. Now, the transition is, "Okay. When do we get our hands on the radios?" That's the big issue right now.

Just to make myself clear, the aftermarket Kenwood radio is available for the auto. I'm talking about tabletops. Right now there are three new manufacturers of tabletops: Polk Audio, Radiosophy and Boston Acoustics.

Dan Mason

***RW:** From what I can tell with the manufacturers, multicasting surprised them.*

Mason: It did. Some of the models were already in production or were ready for production. And it became so obvious that multicasting was going to be the way to go in the future that they had to make those adjustments to kind of "hold the presses," so to speak.

***RW:** Other than the radio availability, what do radio stations most care about as far as HD Radio?*

Mason: I think there's a general concern amongst the radio programmers that we, as an industry, really take advantage of the new frontier with all the HD2 stations.

That doesn't necessarily mean duplicate your competitor. It means be a little brave and bold about trying new formats.

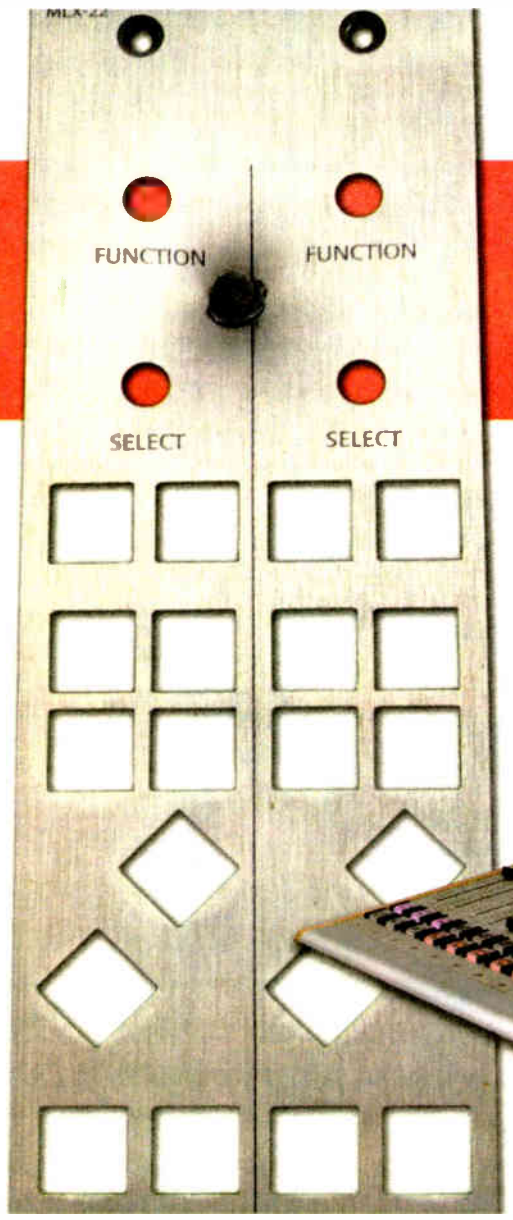
I think there's a lot of excitement there. There's maybe some anxiety that you're really doubling the number of stations on the FM dial. But, at the same time, it's kind of exciting, about all the new applications, or the possibility of new mixes of music and new formats that can be done on there.

***RW:** And if radios aren't coming out until closer to the end of the year, maybe it's not such a big deal. It is for stations, but maybe not to consumers…*

Mason: The radio stations are going to have to drive demand for the consumers by what they hear on the radio (and) how the radio stations sell the concept of HD Radio.

***RW:** By what they say on air about it?*

See MASON, page 20 ▶



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World Radio History

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World Radio History

Mason

▶ Continued from page 18

Mason: Absolutely. That's another thing that we plead with radio broadcasters all the time. Promote this technology ahead of the curve. Don't wait until these things are eventually on the shelves at Best Buy. You can't deal with technology like that. You have to promote ahead on technology.

...

We (radio) have to create a demand for the radios. We did this for AM radio in the 1920s. We did it for FM in the '70s. It is critical that manufacturers be successful early on. Now the biggest issue is the question of creative content.

RW: *Are stations asking you about the data possibilities and all, and whether they can recoup their costs? What are you telling them about data?*

Mason: A few years back there was talk about return on investment. I think the industry has come to grips with being digital is about survival. There is little left in analog in consumer electronics.

As far as data, the opportunities for datacasting are just about anything you can imagine — weather, sports, artist information. If it can be in print, it can be datacast.

RW: *What stands out in your mind as memorable in the early development days of the technology?*

Mason: In 1992, the NAB conducted their annual radio "Fly In" and for the first time we saw the word "Eureka" on the agenda. After that presentation, the radio group heads understood the urgent need to create our own digital solution to AM and FM radio.

Three companies came forward with developmental money: Westinghouse, CBS and Gannett. Thank goodness for these three companies. They probably knew that money wasn't ever coming back, but the industry needed a solution and fast.

Engineers went to work; and amazingly, 10 years later, in 2002, the IBOC technology was finally approved by the FCC, as the digital standard in the U.S.

Imagine how difficult of a road that was for competing engineers to agree on a technical solution. If that wasn't hard enough, throw in the FCC and receiver manufacturers.

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Fans of a local high school basketball team in suburban Maryland might not realize that their public address announcer once ran one of the most famous companies in broadcasting.

Dan Mason, a native of Louisville, Ky., knew he wanted to be in radio since the age of 12. "In the 1960s, I would take a bus to downtown Louisville and stand in the showcase window of the then WKLO(AM) in Louisville just to watch the disc jockey play records and talk. In 1973, I finally got to sit inside that window as a jock."

In 1975, he moved to his first programming job at WZGC(FM) in Atlanta. In 1977, he moved to Washington, where he was program director for WPCG(AM-FM) as well as national program director for parent company First Media.

By age 27, Mason was VP/GM of KTSA/KTFM in San Antonio. He later returned to First Media and was named executive vice president. When that company became Cook Inlet Radio Partners, Mason was named president in 1988.

In 1993, he joined Westinghouse as president of Group W Radio, a division of Westinghouse Broadcasting Co. He was in the job three years before being named president of CBS Radio, subsequently renamed Infinity Radio.

Following that company's consolidation, Mason was responsible for the operation of the group's 184 stations in 1995. As president of Infinity Radio, he integrated the original CBS, Group W and American Radio Systems stations. He takes credit for merging operations, blending business styles and increasing profitability.

Mason is an advisor and consultant to companies in the radio industry domestically and internationally since retirement from Infinity in 2002. Besides Ibiquity, Mason consults for Infinity, First Broadcasting, the Educational Media Foundation, which is a non-profit established to operate a radio ministry, and All Comedy Radio Network.

Last year he and program expert Walter Sabo founded an international radio consulting company, Sobo-Mason International Initiatives. They will present in Greece at the NAB European Radio Conference in October.

He serves on the board of Spanish Broadcasting System Inc. and is a former board member of NAB and CBS Marketwatch.com.

Mason graduated from Eastern Kentucky University with a Bachelor of Science degree in broadcasting. He has two sons and lives in Poolesville, Md.

On the side, Mason does the public address and handles the music system for the local high school basketball team. "I live in a small community. The gym isn't much better than the one in the movie 'Hoosiers.' I bought a used 360 Instant Replay System from an equipment dealer in Buffalo (N.Y.).

"The gym might look like 'Hoosiers,' but the sound coming out of there is like the MCI Center. It's fun."

— Leslie Stimson

World Radio History

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World Radio History

FIRST PERSON

Living With IBOC Studio Delay

by Brian Clark

The author is chief engineer of Clear Channel station KHHT(FM), Los Angeles.

LOS ANGELES For many engineers, when the acronym "IBOC" comes up in conversation, enthusiasm is sold separately. Many of us look at IBOC like we would at something stuck to our shoes or the electric bill that just came in the mail.

When I think of IBOC it brings up visuals of Rodin's sculpture "The Thinker." It makes me wonder. What it is? Why should I be interested? Why should the consumer be interested?

IBOC can be painless if you go into the integration with an open mind. I must admit, I too had trepidation about installing something that only a handful of engineers apparently had receivers to hear.

The biggest issue I've experienced is the 8-second encoding delay. I am sure that as algorithms improve and computer-processing speeds increase, the delay time will diminish.

Failure notification

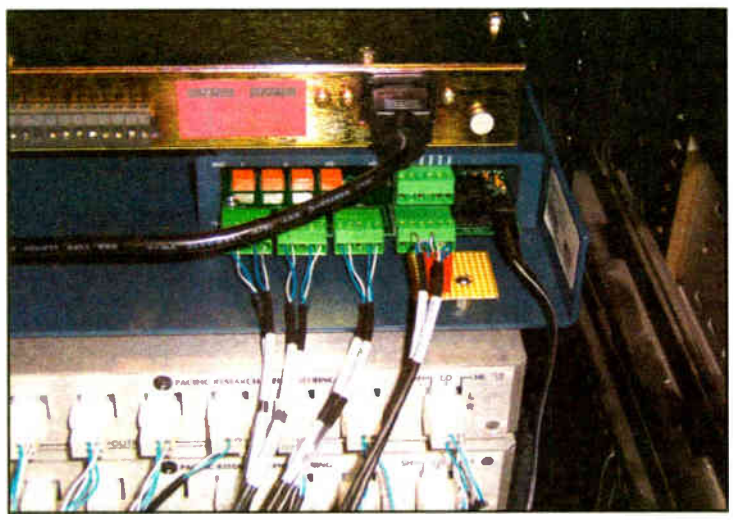
But with the existing encoding delay, it's not possible to monitor your station directly in the air studio. How can we monitor what is going to the transmitter without any sort of audio delay? How should we be notified of a failure in a transmitter or STL, or a sleepy board operator?

I asked several of engineers about this; most use a strobe or Beta-Brite sign indicator triggered by a closure from the air monitor. This is fine, but nothing alerts a person of an off-air condition like radio static from an FM tuner. So I began to think of ways to give the talent that "air monitor feel," without an audio delay to complicate things.

I am using an Inovonics 630 FM receiver, which has two types of closures based on either audio or carrier failures. This is wonderful.

So how to give a jock the feel of listening to air? Instead of a strobe, I decided to devise a system that would allow the board operator to monitor a processed console feed normally. If either the transmitter or the STL were to fail, the source immediately would switch over to the Inovonics receiver as a monitor source. The source would return to the processed console feed if the transmitter or STL returned to normal.

My console has microphone logic that allows switching between two sources when a microphone is keyed, but could not accommodate the task at hand without firmware changes. I did a little research and found the Broadcast Tools SS 2.1 Terminal III Switcher/Router.



Rear view of switcher displaying from left to right: Audio input #1 Orban 8200, Audio input #2 Inovonics 630, Audio Output and Perf-board diode 'Or-Gate' on far-right going into switcher selector input #1.

Front view of racks displaying switcher in position #1, which is the normal Orban 8200 processed audio feed.

Closer front view of switcher showing the normal operating mode in this configuration.

'Trigger' time shortened

When this switcher/router is configured in Emergency Alert System mode, it functions as envisioned. This switcher/router uses relays to accomplish this task, considered by some as old technology.

With the aid of two diodes used as an "Or-Gate" to control each kind of failure, the switcher/router will switch between the two sources seemingly transparent. An Or-Gate is a logic gate whose output will be a logic 1 if either of the two inputs receives a signal high or logic 0 if no signal is present. This type of circuit is useful in cases such as this, where there are two input sources, but only one switching device input.

The Inovonics unit comes from the factory designed to trigger a closure in the event of an audio failure of one, two, three or four minutes.

Even one minute seems long as a trigger time, so I contacted the manufacturer; the technician I spoke with told me that the trigger time could be shortened. By changing capacitor C25 from the default .1 to a .01, the trigger is now six seconds, closer to reality.

With this system in place while running IBOC, there are a couple things to keep in mind. If there is a carrier failure due to a transmitter failure, the Inovonics unit switches immediately to the tuner and then back to the processed feed when the transmitter comes back to life.

In the case of an audio failure, it takes six seconds to switch over to the tuner. When the audio source returns, it takes eight seconds to return to the processed feed, due to the IBOC encoding delay.

I think that's perfect because you really know when you are back on the air. But the talent must be made aware of this delay or they may think something is still wrong and keep triggering audio sources until they actually hear something.

Just coach your air staff to keep an eye on the console meters and assure them that they will hear something on their studio monitor speakers as soon as the IBOC delay buffer has been filled.

Reach the author at brianclark@clearchannel.com.

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World Radio History

IBOC Questions Remain Unanswered

A Number of Issues Need Closure Before This Digital Radio Format Can Really Shine

by Skip Pizzi

Let's conclude our recent look at the next steps for IBOC with consideration of a few unsettled areas: datacasting, transition beyond the Hybrid mode, IBOC surround and content protection.

When the NRSC-5 standard for IBOC was delivered to the FCC last May, it did not include much about datacasting for digital radio. The NRSC communicated that it hoped to have an addendum to NRSC-5 soon that would cover data transmission in IBOC. Since then, the NRSC has produced a revised version of the IBOC standard, called NRSC-5-A, which does include datacasting elements. At press time NRSC-5-A was expected to be delivered to FCC sometime in October 2005, following final approval by NRSC.

It is therefore possible that the FCC's next Report & Order on digital radio will include rules covering IBOC datacasting, which may help to launch that marketplace. It remains to be seen whether there will be much business in this space, however, particularly given the broad competition for wireless data delivery, and the fact that it is not considered core business by most broadcasters.

Promoting uniformity

If IBOC datacasting is to become a robust market, the most credible scenario might involve third parties with direct interest in point-to-multipoint data delivery, who would partner with broadcasters as delivery agents. Nevertheless, the existence of standards and regulations on IBOC datacasting may help seed such a market by providing a stable foundation for it.

Perhaps the thorniest issue here is how to strike a balance between openness and uniformity in this market, and whether the FCC or some other entity will play a role in this. To promote uniformity, Ibiquity Digital has proposed a number of components and features that it would develop and control. Others have commented that this could provide the possibility for dominance of a fledgling market by Ibiquity, and thus potentially allow an unfair level of control vested in a single commercial entity. While this might be inconsequential in the early going, it could be difficult to resolve if the market later became successful.

Without some coordination, however, all data types will remain more or less proprietary, leaving radio datacasting essentially where it is today with FM subcarriers. Although there will likely remain some market for delivery of proprietary data services in the IBOC context, if non-program associated data delivery is ever to become a mass-market enterprise, there will need to be some coordination and standardization of content. The datacasting components added to NRSC-5-A only deal with specification of datacasting *transport*, not content. While standardized transport is an essential enabling element to stimulation of an IBOC datacasting market, establishment of a uniform *content* architecture remains an important, open issue.

One of the most forward-looking elements of the HD Radio system is its ability to transition from Hybrid Mode, in which analog and digital signals share the AM or FM broadcast channel, to All-Digital mode in which the analog service is removed, and only digital services occupy the broadcast channel.

In the case of FM, an intermediate stage called Extended Hybrid also exists, in which a broadcaster can increase the digital payload delivered from the 96 kbps available in Hybrid Mode up to nearly 150 kbps. The additional data, which can be appended in 12, 25 or 50 kbps increments, can be delivered with varying robustness and latency. It is generally assumed to be assigned to additional service(s), rather than to extending the main service for higher-bandwidth delivery.

Extended Hybrid services might affect reception of an FM channel's existing analog subcarrier ("SCA") services, so broadcasters may need to make some decisions, but will that unilateral process be the only consideration? If existing services are terminated, will some FCC permission or notification be required? Of

See IBOC, page 24 ▶

The Big Picture

Photo: Gary Hayes, BBC

by Skip Pizzi

World Radio History

IBOC

▶ Continued from page 23

course, the same question applies — with much broader impact — to a broadcaster's move to the All-Digital mode, for either AM or FM.

The subject of moving beyond stereo on digital radio has been well covered on these pages of late, but there are still some standards and regulatory issues to be worked out here, as well. For one, if multiple surround systems coexist, will there be a format identifier transmitted to allow optimal decoding in the receiver? If so, who will manage the registry of such identifiers?

Further, if surround content is only broadcast on a station's digital signal, with a stereo version remaining on the analog during the Hybrid period, does this run afoul of the FCC's existing rules that an IBOC service's main program audio should be the same as its analog service? This is more than just a difference in processing or audio format, since the two services may actually be airing different mixes originating from separate audio recordings.

Perhaps most controversial is the issue of content protection for digital radio signals.

Perhaps most controversial is the issue of content protection for digital radio signals. If and when any content protection is applied to digital radio, it will almost certainly involve some regulatory action. The recent overturning of the FCC's Broadcast Flag rules for digital television, and the remaining uncertainty on their ultimate fate, render any similar action for digital radio unlikely to happen anytime soon, however. So it is possible that the next digital radio R&O issued by the FCC will resolve all the issues listed here except for content protection, which it will leave to a subsequent ruling.

Of course, most of the driving force behind enacting digital radio content protection comes from the music industry, which is concerned with any further erosion of its business through uncompensated digital distribution of its content. Yet there are other applications for such protection that might provide benefit for broadcasters or consumers instead.

Consider subscription radio via IBOC supplemental program service or datacasting. This would require some form of conditional access, and if there were a standardized system for this in place — or at least a standard framework for use with a variety of proprietary algorithms — the process of launching the terrestrial subscription radio business would be greatly simplified. Similarly, the downloading of premium content (e.g., music files) via IBOC datacasting would require protection by a digital rights management (the "other" DRM) system, and this, too would likely require regulatory intervention to establish.

Finally, don't forget about what the FCC calls "assisted living" services, such as radio reading services for vision-impaired listeners. Today these services are offered for free to qualified consumers, and the services themselves enjoy free access to copyrighted content, such as the newspapers, magazines and books that they read on the air.

The services can do this legitimately due to special status that exempts them from copyright rules, which would normally preclude them from legally reading this amount of content directly from such publications without license to do so. But the basis for this exemption is the fact that the reading services are inherently limited in their broadcast scope to only those listeners equipped with specialized subcarrier receivers, which are not generally available in retail outlets.

As noted above, ideally the IBOC datacasting world can advance beyond such a balkanized subcarrier milieu into a standardized environment where service quality and equipment costs benefit from digital economies of scale. But if these reading services simply become another standard supplemental service available to all listeners at the flick of a switch, they risk losing their copyright exemption. Thus some form of conditional access or other copy protection scheme may be required, even for a free service.

As the HD Radio train lurches from the station, it's important to observe the activity that's still taking place back on the platform — and there's still plenty of it. Watch this space for continuing updates.

Skip Pizzi is contributing editor of Radio World.

How to Submit Letters

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

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

World Radio History

Studio Sessions

Radio World | Resource for Radio On-Air, Production and Recording | September 28, 2005

AES Has Daily Broadcast Events

Bialik Organizes Sessions Focusing on Surround, Digital Radio and Remembering Armstrong

by Kelly Brooks and Flip Michaels

An expected 20,000 people will attend the AES convention in October, when the show returns to the East Coast. Several sessions are programmed to appeal to broadcasters.

Topics include HD Radio implementation and surround sound demos as well as panels and workshops that feature industry speakers from companies like Fraunhofer, Cox Radio, Telos/Omnia/Axia and Radio World.

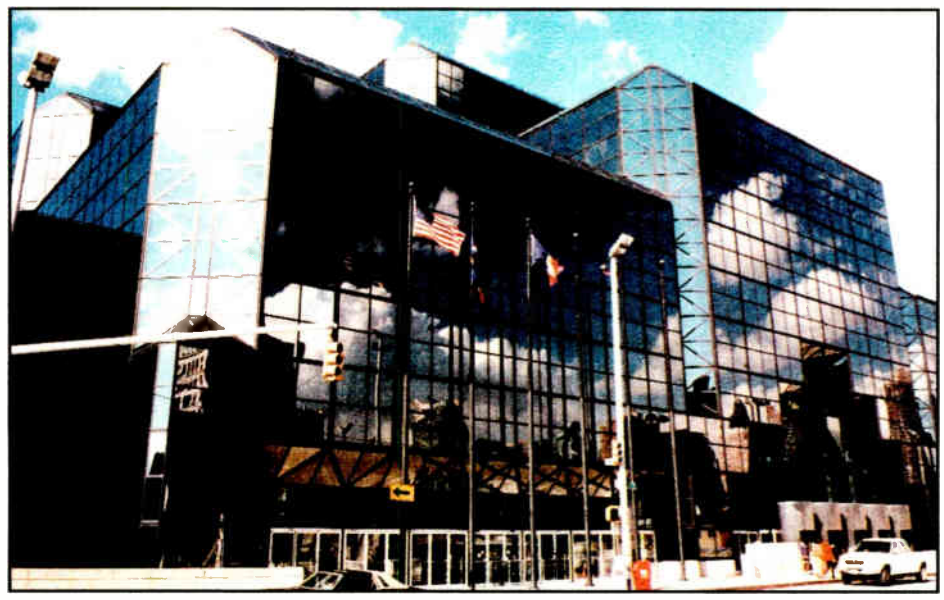
Some 400 exhibitor booths are planned for the show, which runs Oct. 7-10 at the Jacob Javits Convention Center in New York. Registration costs vary. A non-AES member attending the full program pays $410 on site. Various discounts apply for students, AES members, exhibits-only visitors and advance registrants.

"This is the first year that there are events for the broadcaster every single day of the convention," said David Bialik, systems consultant for DKB Broadcast Associates and the convention's broadcast chair. "I've been chairing for over 14 years, and this year's events are the best we've ever had.

"The show's audience is made up of engineers with audio as their main concern, not programming or marketing executives. We have the surround sound forum, and the loudness workshop is going to be chaired by Emil Torick, who used to run CBS Labs and is the father of the Audimax and Volumax."

Bialik referred to Saturday's "Surround Sound for Digital Radio Forum" and a newly added workshop on loudness and perception. Details on the latter were still being arranged in September.

"I'm going to have Mike Dorrough on the (loudness) panel, Frank Foti, Marvin Caesar of Aphex and I believe Bob Katz (of Digital Domain), and there's going be an audiologist," said Bialik. "This is going to be cool. Mike Dorrough is already planning some sort of demo for it, and it should be really interesting.



The Jacob Javits Convention Center expects 20,000 audiophiles to attend the 119th AES convention.

"Not one person I invited turned us down," he said. "The working title right now is 'Loudness,' but it's going to be covering perception and perceived loudness and talking about listener fatigue. One of the neat things is that we got an audiologist to actually sit on the panel with us to talk about this."

The surround sound forum features Steve Fluker of Cox Radio Orlando; Frank Foti of Telos/Omnia/Axia; Stephen Geyersberger of Fraunhofer; Alan Kraemer of SRS Labs; Steve Lyman of Dolby Labs; Tony Masiello of XM Satellite Radio; Noel McKenna of Audio Processing Technology; Geir Skaaden of Neural Audio; Skip Pizzi of Microsoft; and Mike Pappas of KUVO(FM) in Denver, whom Bialik notes has a playback planned for his Monday tutorial on mixing live 5.1

Pizzi, also contributing editor for Radio World, said an important issue is that of "matrix" surround systems and the possible effect on a station's analog signal.

"The question of matrix on analog is probably the main issue right now. It's Question Number One that has to be settled," he said. "It doesn't mean you couldn't just put surround, matrix or otherwise, on your digital. That's already been checked by Ibiquity. All the matrix systems — the three that have been proposed — are approved by Ibiquity, and they would seem to work fine on the HD signal.

"The question is because they are easy to pre-encode into your stereo signal, broadcasters could want to just make it simple and put it in the main channel. If they do that, though, how will it affect the analog broadcasting? That issue's been around for many years, and for one reason or another has never happened."

He said NPR has volunteered to perform tests to explore the matter, and is willing to share the results with the NRSC.

"They could possibly use the tests, if they are definitive enough, to help make a recommendation on what broadcasters should do regarding analog," he said. "Even though we are talking about digital surround for matrix systems, it would be nice if you wouldn't have a problem putting them on analog too."

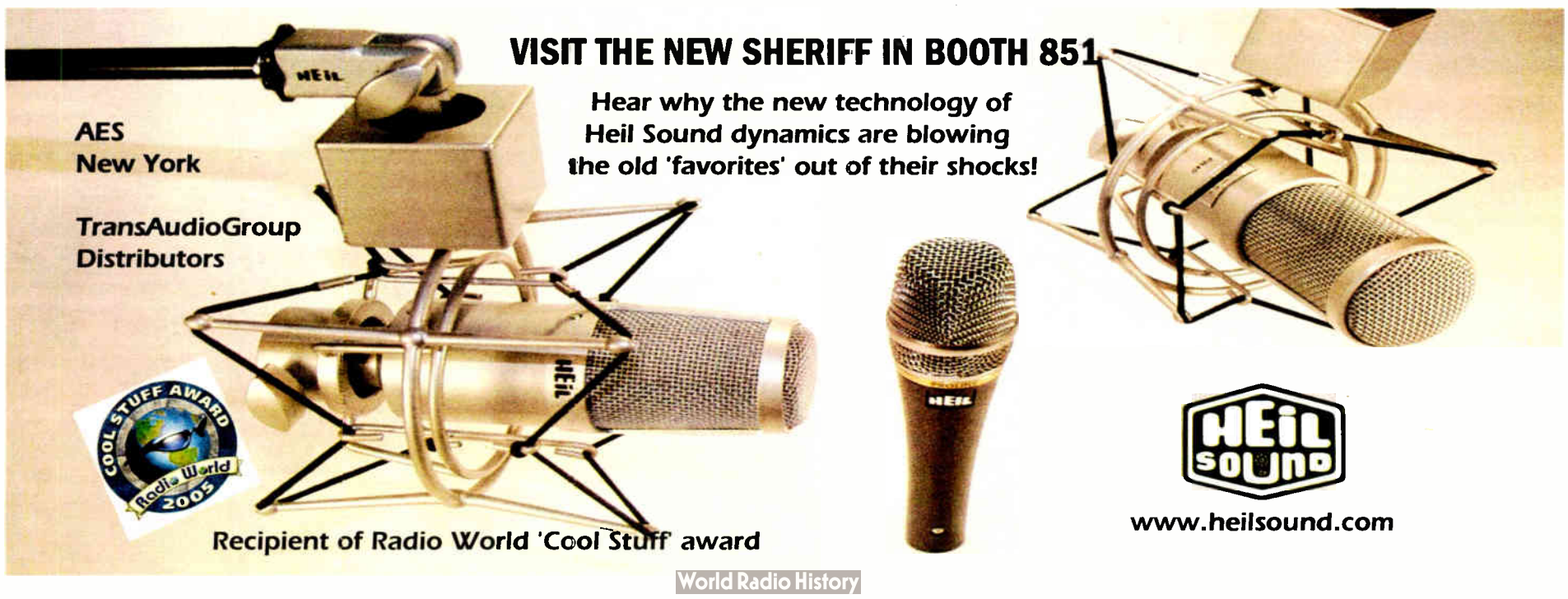
Multicast, supplementals

The Digital Radio Forum features some participants of the surround forum, as well as representatives from Digital Radio Mondiale, NPR and technology developer Ibiquity. Panelists include Masiello and Pizzi; Mark Kalman of Sirius; David Layer of NAB; Mike Lyons of Ibiquity; David Wilson of the Consumer Electronics Association; Jan Andrews of NPR; and Leonard Kahn of Kahn Communications.

"I'm very intrigued by multicasting, and that's going to be one of the topics we're looking at. We have some people from NPR coming in to talk about that," said Bialik. "I think multicasting can be an interesting proposition as long as it doesn't sacrifice quality, or (rather) the quality that the listener is used to."

Pizzi said the topic of the moment is supplemental identification, given that surround is not as much of a "killer app" as multicast. While NRSC task groups are prohibited from releasing findings to the

See AES, page 27 ▶



World Radio History

Investing in Surround Sound is Good Business

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- Surround sound's use and impact in sports, music and educational content
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Thursday, October 6 *(immediately preceding the 119th AES Convention)*
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New York, NY

8 a.m.-9 a.m. On-site registration and continental breakfast

9 a.m.-5:30 p.m. **Seminar Program:**

- Introduction/History and Overview of Surround Sound
- Surround Sound Broadcasting
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- Implementing Surround Sound at the Broadcast Facility
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Skip Pizzi, who is moderationg the seminar, is a renowned expert in digital audio and co-chair of the NRSC Surround Sound Audio Task Group, as well as a Contributing Editor to Radio World. He is also a former technical training manager for broadcast technology.

Registration Form

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World Radio History

AES

▶ Continued from page 25

press, discussion points include the types of displays proposed for supplemental channels, "and also things like navigation too, not just ID. Like: when you scan, do you scan all the supplementals, or do you just stop on all the main channels? And then if you want to check the supplementals, if there are any, do you have to touch a second button?" Pizzi said.

Multicasting raises an important flag, he said: the difference between additional service and additional stations. He said while most broadcasters offer expanded content from the main channel, such as deeper tracks or "older oldies," some broadcasters may try to turn a supplemental into an entirely different station.

"You need to be a little careful in regulatory space, or at least the public activist space. If you're doing it right, you're adding service to your community, you know, it's a good thing," said Pizzi.

"On the other hand, if all of a sudden you're trying to make it look like, 'We're a consolidated operator that has eight stations in a market, but now we're actually going to have 40,' then hold on a second.

"Be careful what you wish for. Raising the flag the wrong way can really attract some unwanted attention. Particularly with the FCC getting so much heat about media ownership and consolidation, this could just add fuel to the fire if not done carefully."

And what digital radio forum would be complete without acknowledging CAM-D, about which Ibiquity said in an August reply to the FCC's latest inquiry on IBOC, "The complaints about AM IBOC are largely from skywave enthusiasts and proponents of what is asserted to be the 'CAM-D' system. CAM-D, which has never been detailed to the commission, demonstrated publicly or shown to work, builds upon the failed legacy of AM stereo broadcasting."

Its primary advocate will attend.

"Leonard Kahn has agreed to be on the digital radio panel, and I've invited him to talk about CAM-D, so maybe he'll say something. Maybe," said Bialik.

Back to the future

AES events at the show also will look back and celebrate radio's history.

Under the category of historical events falls the 70th anniversary of the first public demonstration of FM broadcasting. A session on the topic also recalls the recent Alpine Tower commemoration of the anniversary; it is organized by Solid Electronics Labs principal Steve Hemphill, Bialik, Scott Fybush of Radio World/Northeast Radio Watch and RW U.S. Editor-in-Chief Paul McLane.

This "Look at Major Armstrong's Contribution to Broadcasting" features, among others, panelists Henry G. Dietz of the Henry G. Dietz Co.; Renville H. McMann Jr. of CBS Laboratories; Gilbert R. Houck of Houck and Bowen Engineering; and Robert Carter Brecht, a descendant of the FM innovator Edwin Howard Armstrong, whose innovations are at the center of the event.

The convention ends with a live performance of an as-yet-untitled audio drama co-produced by Bialik and Himan Brown, deemed by The Radio Hall of Fame to be "one of the most respected figures in radio history."

Bialik said Brown was courting some "high-profile" actors. "Just to work with Himan Brown is really cool. I grew up listening to his stuff," he said.

Other events include the histories of live sound and recording studios.

You might want to bring a jacket for a technical tour of the notoriously frigid David Letterman studios at the Ed Sullivan Theatre. A history event will look at New York's "tightly knit consortium" of recording studios in the 1950s and '60s. Also featured is a tour of the Trutone vinyl mastering studios; and tours of the Electric Ladyland Studios and Chung King Studios, which have recorded tracks for Jimi Hendrix and the Beastie Boys, respectively.

For a list of broadcast events and registration pricing, visit *www.aes.org*.

Kelly Brooks is associate editor of Radio World. Flip Michaels is a contributor.

Beyond broadcast: A tour of Trutone Mastering is on Saturday from 1-4 p.m. The studio specializes in cutting lacquer discs on vintage Neumann lathes, and has done vinyl mastering for major and independent studios.

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World Radio History

PRODUCT EVALUATION

Tieline Gets WZIP to New Locations

by Blake Thompson

Remotes are a fact of life in radio, and we have more options than ever. Let's start with the lowest quality, a cell phone; in the typical spectrum of remote choices, we then move up to a regular phone line (POTS), single-line frequency extenders, a Marti system, POTS codecs and ISDN. In general, better sound quality usually equals less portability, higher costs and more setup/prep. Just getting a regular POTS line installed can run into the hundreds of dollars.

Luckily for us, codec manufacturers are now up to third-generation devices and some have "stream over GSM" systems available.

The major issue is one of bandwidth. The maximum present U.S. cellular data rate is 6.8 to 9.6 kbps. Anyone who has tried to listen to an 8 kbps stream knows how poor it sounds. Tieline is addressing this niche with its G3 series of remote codecs. The company has developed a custom algorithm that it says can give up to 7 kHz audio at rates as low as 9.6 kbps.

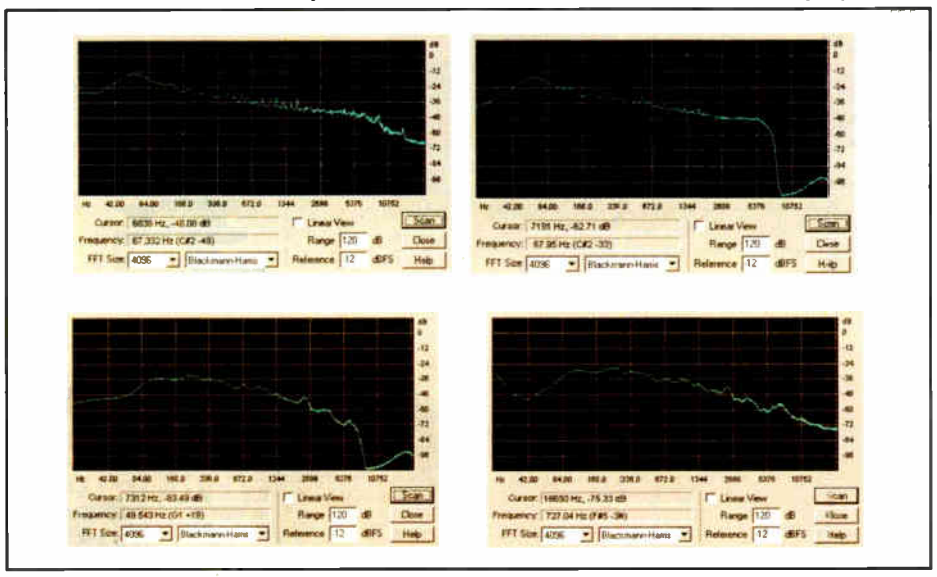
Those still using standard cell phones for remotes know how inconsistent the quality is. This new system can give you a consistent 16 kbps MP3 stream from your remote.

New approach

I serve as chief engineer for WZIP(FM), a student-run station at the University of Akron on 88.1 MHz running 7.5 kW at 800 feet. We operate the station as a professional broadcast training program. We use ENCO automation, Harris AirWave boards, Aphex processing, Harris Z Series transmitter and CD Link STL.

Over the past 25 years I've tried many phone remote systems for our sports broadcasts, all of which had to be run by students with minimal training. We went from an old Zercom Maxi-tel system to single-line frequency extenders, then on to three-line extenders and finally second-generation POTS codecs. Every step was an upgrade in sound quality and complexity.

After some issues with dropped links and inability to get POTS lines in some venues, we decided to try a cellular approach. After extensive research I purchased the Tieline i-Mix G3/TLM-600 for the remote mixer/codec and an older, but still compatible, Patriot for the studio end. Now there is a G3 rack unit available for the studio.



Clockwise from top left: music direct; music coded; voice direct; and voice coded.

The G3 series share some common elements; they have a large rotary menu selection knob, four-line LCD display, input level, headphone level and balance, channel on/off buttons, a dial pad with extra function buttons and a bank of four user-programmable softkeys. Units also feature a four-pin XLR for the 12 V DC power supply input, using an inline supply with a standard IEC power cord. There are two battery power options available for the field units that can give you up to 3.5 hours run time, and a car lighter adapter.

The plug count on the five-channel TLM-600 is impressive. There also are mic/line inputs with switchable phantom power on XLR plugs; two XLR program outs; standard 1/4-inch headphone jacks; RCA aux in and out; Phoenix plug control in/out; and RJ-11 phone line jacks. A set of RS-232, USB and LAN plugs for configuration/control are included, as are IP streaming applications.

On the side is a slot for the optional plug-in modules ($895 each) for GSM cellular, ISDN or a second POTS module for dual mono/stereo broadcasts. The modules slide in and are locked in place with screws.

Units come with a software package called the Toolbox. With this program you can connect to the unit and setup functions, defaults, softkey settings, phonebook entries, audio levels and audio matrix routing; and you can take remote control of all functions. This is a great addition, as it allows you to load up to 98 profiles into the system, which you can use to switch from GSM to POTS, for example.

The Toolbox also allows software updates to be loaded. The i-Mix is really a codec/phone interface with a small digital mixing board added on.

Easy setup, control

When we received our G3 i-Mix and the older Patriot unit, the cellular modules were not available yet, so we just used them in the POTS mode for our first few games. The sports team only needed 15 minutes of training to use them, with minimal calls to my cell phone. We were impressed with the sound quality and robustness of the calls. In locations that had given us trouble with our older codecs, we had no drops at all.

The announcers loved the easy setup and control. One feature I loved is the digital Intelligent Gain Control, which lowers the input level automatically if the signal is too hot, and includes a peak limiter. No more digital clipping when the games get exciting.

Another feature I like is the alarm buzzer. You can assign one of the softkeys to a "piezo alarm" and when you press it, the other end gets a buzzing alarm — just to get someone's attention of course.

After getting the GSM module in, we set up our cell account with T-Mobile. The GSM module is an entire cell phone, so all you do is put your SIMM card in the included holder, slide it in the slot and attach the antenna. A portion of the manual and two extra data sheets are devoted to describing how to order your cell service with the Circuit Switched Data you need. You can't just put your regular cell SIMM card in and expect it to go.

Since that time we received a new cellular antenna from Tieline that has a 3 db gain over the older unit, and updated codec/control software. I hooked up the updated system using a Commander G3 TLF-300, loaned for testing, and gave it a go. It worked everywhere I tried, and even ran several feet from an AM/FM transmitter room with no drops.

The GSM can have up to a half-second delay, some of which is from your cellular provider. I did some testing on the G3 system and found the GSM quality to be almost equal to a 24 kbps mono MP3 stream. It sounded close at 20 kbps but the treble was still better with the GSM.

The MP3 encoder I use has an 11 kHz sample rate for the 6 kbps-20 kbps encoded streams; I needed to have a 22 khz sample rate to get the high end to compare with the GSM codec. I then recorded some music, and my voice direct and GSM-coded into Cool Edit Pro to do some frequency analysis, and found the response was good out past 7 kHz in my setup. That is why I had to get above the 11 kHz sample rate — that extra 1/2 octave makes a difference in the perceived voice quality. Some screen shots of the frequency response from my tests are included on this page.

The GSM codec works well. There is the expected MPEG-style "high-end swishing," but much less than you would expect at these low bitrates. All in all it is a major step up over any other wireless system I have heard. I will still try to get a POTS line to use in most locations, but now I have a wireless option. The Tieline i-Mix G3/TLM-600 retails for $4995.

Blake Thompson is chief engineer for University of Akron station WZIP(FM) in Akron, Ohio.

Product Capsule:
Tieline i-Mix G3/TLM-600 Remote Mixer/Codec

Thumbs Up

- ✓ Cellular for remotes: no landlines required
- ✓ Flexible operation
- ✓ Profile/preset switching
- ✓ Intelligent Gain Control is a game-saver
- ✓ Good to great sound in all modes

Thumbs Down

- ✓ U.S. GSM limitations
- ✓ GSM SIMM slot a little larger than the card

Price: $4,995

Tieline Technology in Indianapolis at (317) 845-8000 or visit www.tieline.com

World Radio History

PRODUCT GUIDE

Telos Distributes NeoWinners Contest Software

Telos Systems says it entered into an agreement with Paris-based NeoGroupe to distribute NeoWinners, a contest-and-winner tracking software package that helps operations managers and promotions directors manage large numbers of call-in contests.

The product is represented domestically by Telos; it also will be available internationally from some Telos distributors.

The NeoWinners suite is designed for use with Windows, and also can interface with Telos TWOx12 and Series 2101 talkshow systems. The company says the package is especially suited for large station clusters and stations. It helps automate the task of scheduling giveaways and tracking winners, keeping a real-time count of

prize inventories and helping to identify and eliminate "serial winners."

Additional features include the ability to eliminate error-prone paper tracking of prize inventories, contest schedules and "who won what"; automate compilation of event-related guest lists; keep a detailed inventory of available prizes; automatically generate prize letters, mailing labels and winner lists; and use Caller ID services to identify callers and access caller database information.

NeoWinners also has reporting and data mining features that enable promotions personnel, talent and front office staff to access information about winners and prizes using a common, central database, which the company says eliminates lost and conflicting information and confirms prize disbursement.

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

Program Orange Has Cart Stack Software

Pittsburgh-based Program Orange has been writing radio software for three years and has released its first automation system, the Cart Stack. It is software designed for small- and medium-market radio stations as well as Internet stations. The Cart Stack is compatible with Windows 2000 and

XP-based machines.

Cart Stack offers three automation types: satellite mode, walk-away mode and live assist. It also features music scheduling, voice tracking and on-screen Weather Now updates. Its interface features an on-screen cart stack as well as instant-fire push-button carts, which the company says are handy for fast-paced morning shows with many recorded bits.

The Cart Stack Production Room allows the user to manage audio cuts, schedules and satellite controls. Features include the Audio Library, which enables the user to import and record up to 20,000 MP3, MP2, .WAV or OGG cuts; and allows single cuts to be edited individually, or multiple cuts to be edited simultaneously.

Intros, endings, categories and other information about audio cuts can be set up within the Audio Library. Cuts are sorted by artist, title, type, length and category.

For information contact Program Orange in Pittsburgh at (412) 661-0599 or visit its Web site at www.cartstack.com.

World Radio History

If Loving 8-Track Is Wrong ...

'Trackers' and News Groups Like 8trackheaven.com Help to Keep the 'Kachunk' Alive

by Tom Vernon

Anyone who came of age in the 1970s probably remembers 8-track tape players and the familiar "kachunk" sound they made when changing tracks. The 8-track medium had a comparatively short life span, starting in the early 1960s, peaking in the '70s when it was the predominant portable and car audio format, and winding down by the mid-1980s.

As with other audio technologies such as vinyl discs and vacuum tubes, 8-track has a loyal group of supporters, called trackers, who keep the medium alive. So while "kachunk" isn't heard often, it hasn't disappeared from the consumer audio soundscape.

A format is born

Eight-track had its origins in the early 1960s, when William Powell Lear of Lear Jet fame developed and patented the system. There were other continuous-loop audio cartridge formats at the time, including the broadcast cart and consumer 4-track. There are significant differences between the systems.

While broadcast carts used a cue track with audio tones to stop the cart after one play, 8-track tapes had metal foil over the splice that triggered a solenoid to switch tracks by changing head height. Once started, 8-track players will play indefinitely.

The 4-track format contained two stereo programs. Due to the amount of 1/4-inch tape that could be wound onto a cartridge and played at 3-3/4 IPS, the total playing time was limited to about 40 minutes. By proposing eight tracks, Lear was able to effectively double the playing time of his cartridges.

The Craig 8-track Stereo Player

While the 4-track system had the pinch roller on the tape deck, Lear's 8-track medium had the pinch roller inside the cartridge. Changing the location was an effort to eliminate tape jams, and also made Lear's system patentable.

One of the shortcomings of the format was related to close spacing of the eight tracks on 1/4-inch tape. Even slight misadjustments of tape height, either through the head or the cartridge itself, resulted in crosstalk. Because the adjacent tracks had completely different audio, this interference was most annoying. Some machines had a mechanical front panel adjustment to make slight changes in head height in an effort to eliminate this problem.

While Lear developed and patented the 8-track system, it took savvy marketing and collaboration among several companies to make the format successful. Lear focused most of his efforts on the car stereo market, and in 1966, all Fords came with a factory-installed in-dash 8-track player. The next year Chrysler and GM followed suit.

In the early 1960s, most cars only had an AM radio, and the introduction of in-dash 8-track players marked the first time consumers had a choice of what type of music they wanted to listen to while driving. Collaborations, first with RCA and later with Ampex, provided a source of pre-recorded music for the new medium. Interestingly, 8-track tapes were initially sold in auto supply stores rather than record shops, reflecting the targeting of the automotive market.

Most of the initial marketing of 8-tracks was to sell pre-recorded music, but as component decks became more popular, recorders and blank tapes were introduced. Radio Shack became a large supplier of blank tapes and 8-track cartridge repair kits. Recorders began to appear in 1969, and production wound down around 1974, as the cassette format was becoming more popular.

Culture club

The 8-track medium also played an important part in the four-channel movement of the 1970s. The eight tracks could be configured easily to create two quadraphonic channels for discrete quad. The only catch was the program time was half that of a stereo 8-track cartridge.

RCA was instrumental in introducing the Q-8 cartridge They also produced complete home systems for the new format, as well as a wealth of pre-recorded quad material.

Eight-track tapes began to disappear from retail stores in the late 1970s, but the format was kept alive by record clubs such as RCA, which continued to manufacture and distribute tapes into the mid-1980s. Michael Jackson's "Thriller," Madonna's "Like a Virgin" and "Purple Rain" by Prince were among the last hit albums released on 8-track. However, independent labels and artists continue to release material on 8-track tape cartridges.

Eight-track enthusiasts were the topic of a 92-minute documentary film. "So Wrong They're Right" chronicles a filmmaker's 10,000-mile journey across the United States in search of "trackers." The result is approximately 20 interviews with collectors who share insights on aspects of the 8-track culture.

Trackers are an enthusiastic group, with a love of the medium. Malcom Riviera, a collector and webmaster of 8trackheaven.com, has about 30 machines in his collection. "I started in the early '90s," he said, "when you could get machines for about $2, and tapes for 10 cents each at thrift shops and yard sales. It was kind of a goofy nostalgia thing at the time, which has matured into a more serious hobby."

Today, 8-track tapes sell for one to two dollars. Machines can be purchased "as is" on eBay for around five dollars, while fully restored player/recorders can fetch as much as $225.

The Telex changer plays 12 8-track tapes back to back, for 8-9 hours of continuous music.

Many trackers also collect other 1970s audio gear. Riviera's most unusual machine is a Telex unit that plays 12 8-track tapes back to back, allowing for 8-9 hours of continuous music. Other odd devices include hybrid 8-track-cassette players, manufactured during the brief period when the two formats had equal popularity.

One thing serious trackers need to know is how to repair the tape cartridges. Riviera said the most common problem is the foil splice tab, which eventually becomes unglued and must be replaced. Foam pressure pads and pinch rollers also may need attention.

Among the most unusual tapes Riviera has collected are blanks that have radio airchecks from the 1970s recorded on them. Even more rare are airchecks of stations broadcasting in 4-channel, which could only be recorded on 8-track or open reel format.

It is hard to estimate how many people are collecting 8-track players and tapes. Riviera regularly gets e-mail from people discovering his site. Most are surprised to know any one else is interested in 8-track technology. The 8trackheaven news group has about 200 regular contributors.

Tom Vernon is a frequent contributor to Radio World.

STATION/STUDIO SERVICES

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World Radio History

PRODUCT GUIDE

Genelec MDE Series Are Active Monitors

Genelec this spring exhibited a line of near-field two-way systems. The 8000 Minimum Diffraction Enclosure series of biamplified active monitors consists of three models that replace the 1029A, 1030A and 1031A.

The new models use an enclosure with rounded edges and a curved front and sides. In addition to frequency response, the minimized cabinet edge diffraction offers imaging qualities. Each uses an aluminum MDE design with Advanced Directivity Controlled Waveguide, which the company says yields large internal volumes with mechanical strength.

The 8030A, shown, the smallest, features a 5-inch bass driver along with a 3/4-inch tweeter loaded into a new Advanced DCW. The intermediate-sized 8040A incorporates a 6-inch woofer and a 3/4-inch tweeter, also set into the Advanced DCW. The 8050A is the largest, using an 8-inch bass driver and 1-inch tweeter.

Genelec also offers the 8030A Triple Play stereo monitoring system, which the company says eases the process of creating a new multi-channel monitoring system or upgrading an existing stereo monitoring environment to 5.1 surround.

Contact the company in Massachusetts at (508) 652-0900 or visit www.genelecusa.com.

BW Broadcast Has 'Mini' Version of DSPX

BW Broadcast released a low-cost FM broadcast processor, the DSPX mini, which it said draws from the company's DSPX and the six-band version, DSPeXtra. The Mini offers a 4+4 AGC and limiter processing architecture, but with a reduced feature set. It does not have the analog and digital outputs of the sister models, but it does contain the same stereo encoder. The DSPX mini retails for $1,700.

For broadcasters who only need the stereo encoder, the Mini is available in a version without multiband processing. The company says this version is suitable for stations that process at the studio, but require stereo generation and peak control at the transmitter site. That version is $1,150.

For more information, contact BW Broadcast's U.S. distributor, Broadcasters General Store, in Florida at (352) 622-7700 or visit www.bgs.cc.

Broadcast Depot Plans Seminar

Broadcast Depot announced dates for its Digital Radio Seminar 2005, which it will host at its offices in Miami Oct. 12-14. The registration fee is $100, which the equipment distributor says will be credited toward attendees' next purchase.

The seminar includes presentations by Telos/Omnia/Axia on Omnia-3, -4 and -5 audio processors, Axia products and Telos ISDN and codec gear. Audioarts will show digital audio consoles; Auralex will discuss acoustical treatment in a broadcast facility. Staco Energy and software supplier Radio 5 will present.

Day Two includes presentations by Audemat-Aztec on tools to measure the quality of the radio signal, and Orban on preparation of AM and FM processors as well as preventive maintenance information for certain models. Avcom and TFT will offer presentations about their product lines.

Several sessions will deal with the transition to HD Radio. An Ibiquity representative will speak on preparing for the technology, as will officials from Jampro and Nautel. Comrex will discuss its new Broadcast Reliable Internet Codec. Adema, LBA and RVR will present as well.

For information and to download a program and registration information, visit www.bdnow.com.

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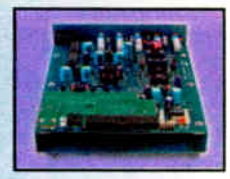

USER REPORT

WOR Replaces MD With BurnIT Plus

by Kerry Richards
Chief Engineer
WOR(AM)
Buckley Broadcasting Corp.

NEW YORK Last year, in the middle of planning the WOR move from Times Square to Lower Manhattan, we realized that our MiniDisc use was becoming problematic and we would need to pick a new "in-house" media. It seems we always had two and sometimes three MD decks out for service at a time, and the reliability factor on the MiniDisc format was becoming a big problem. On top of this the manufacturer of our decks stopped selling them and support was dwindling as well.

We started examining what we could use to replace MiniDiscs, and because we were constantly burning CD-Rs in computers for our clients and in-house use in various workstations, it was a no-brainer. We needed to install real-time CD burners to replace the MiniDisc format in the WOR facility.

CD-R

Our dealer Buck Waters at Broadcasters General Store suggested we try the **HHB** CDR830 BurnIT Plus. We agreed to try several of the units on our Radio Network feed, where we are recording and playing back MiniDiscs as a backup for our audio server. We installed the HHB BurnITs next to the MiniDisc machines and ran them in parallel to make sure all was okay for a few weeks.

The CDR830 has every kind of input and output you could want. There's unbalanced and balanced analog audio on RCA jacks and XLRs, AES and coaxial or optical digital inputs and outputs. Remote start and stop functions are brought to a DIN connector for connections to the outside world for easy contact closures of your choice. In our case, the WOR master clock system sends a contact closure to start the recording or playback at WOR networks start time.

Control Room One Operator Ben Soto (left) and Chief Engineer Kerry Richards in front of a typical WOR Control Room where three HHB BurnIT decks are used for daily air and production duties.

The hardest part about this project was the learning curve for our WOR Master Control operators, switching from MiniDisc operations. The staff has had to learn how this format works, and also the differences between CD-Rs and CD-RWs. We had to educate them in CD-R operations such as finalizing and reinitializing discs.

After about a week we found the BurnIT operations to be reliable and trouble-free. We have these units in operation 24/7, and they are either playing back network hours or recording them for backup use.

When it came time to move the WOR plant our corporate Vice President of Engineering Tom Ray here at Buckley Radio determined that the MiniDisc format has seen its day and we would need to start burning stuff onto hard drives or some other movable media. We decided in the new WOR plant to go both ways. We have supplied our staff with workstations for editing purposes and plenty of HHB BurnITs to record CD-Rs and CD-RWs as the movable media of choice.

Burn, baby, burn

We have installed more than 30 of the HHB BurnITs at the new WOR studio complex. They are also in our newsroom and in the editing suites. We use them on a daily basis for real-time recording and playback. We burn all of our airchecks, client disks and outgoing media on CD-Rs. It is also the movable media of choice at WOR for our producers.

The disadvantage to this format and the complaint from our producers has been that they cannot edit on the BurnIT like they could the MiniDisc decks, but we have provided Adobe Audition everywhere for this purpose. And even better — they can now rip BurnIT-made CD-Rs into our ENCO system and manipulate the audio, something they could not do before.

As far as the HHB decks, the quality of the reproduced audio exceeds our expectations. For almost a year we have been running HHB BurnITs on the WOR Radio Networks, and the only problem we have had is with "Cheapie Media."

Be careful what you feed into the machines. Use a known grade of CD-Rs and CD-RWs. We like the Taiyo-Uden CD-R 80s from Broadcasters General Store. They have the right price and seem to be trouble-free. HHB also makes great media for all of its machines. Clients have brought cheapie CD-RWs, like the ones found at the office supply or drugstore, into our plant and they act up or will not record completely.

Corporate has determined that MiniDisc use here in the plant will cease at the end of the year. So we have left a legacy MD machine in each control room for use in transferring audio to CD format.

I have added two of the HHB BurnIT decks to our remote gear, which we use several times a month. These machines will interface to anything in the environment, are rugged and come with complete manuals for setup, use and operation. And BGS' price — $745 — ain't bad, either.

For more information, contact BGS at (352) 629-7000 or HHB's U.S. distributor Sennheiser Electronic Corp. in Connecticut at (860) 434-9190 or visit www.sennheiserusa.com.

World Radio History

TECH UPDATES

Fostex FR-2, PD-6 Record at 24-Bit/96 kHz

FR-2

Fostex America debuted its FR-2 portable two-track field recorder, which records at a maximum 24-bit/192 kHz and to Broadcast WAV Files that can be downloaded via USB to a computer for post-production. Additionally, it records to PCMCIA 1.8-inch and Type II Compact Flash cards.

Features include a 10 second pre-record buffer, limiter, and battery power and phantom-powered balanced mic inputs. The company touts the FR-2's "file-per-take" system with scene and audio-take naming, which was developed on the Fostex PD-6 and DV40.

The optional timecode card has a reader/generator that includes 23.976 and external word/video references. The FR-2 retails for $1,499.

Fostex also offers the PD-6 portable location recorder, which features 24-bit/96 kHz audio quality and six independent audio tracks. Features include the BWF recording file format (interleave 1 file mode) in two-, four-, five- and six-track modes along with simultaneous two file recording modes of 1+5 and 2+4 tracks for guide track audio.

The Pre Record function enables the PD-6 to buffer up to 10 seconds of audio, which the company says equates to "no more missed takes." Two auxiliary 12V outputs on Hirose four-pin connectors provide power for radio mic receivers for self-contained operation on location.

Other highlights include monitoring through headphones and/or the PD-6's speaker and amplifier. All track combinations can be monitored post-disc either individually, in summed mono or stereo modes. MS monitoring is standard. Aux return and stereo bus live monitoring is provided plus individual channel PFL.

Additionally, a six-channel mixer; "easy access" monitoring; slate microphone and tone generator; and connectivity are featured.

The company's Web site has FR-2 and PD-6 software upgrades available for download.

For more information, including pricing, contact Fostex America in California at (310) 329-2960 or visit www.fostex.com.

Tascam CD-601mkII Selects Online, Monitor Play

Tascam says its CD-601mkII broadcast CD player is a redesigned version of a popular radio player, and features remote control and monitoring and playback options. A radio talent can select between online play (on the air) and monitor play (pre-listen), controlling whether CD playback reaches the on-air mixer or the monitoring device.

The optional RC-601mkII remote control allows frame-accurate search using the jog wheel, direct location using numerical keys, index searches or flash starts. The CD-601mkII can save 10 cue points per CD, controlled using the Flash Start function.

CD-601mkII

Features useful to radio include pitch control, auto cue with five threshold levels, Auto Read and CD Text.

The deck provides a sample rate converter for 48 kHz playback; S/PDIF and AES/EBU digital outputs; and XLR balanced and RCA unbalanced outputs. Also featured is a Fail Safe function to avoid unintentional operation during On-Line playback.

The company also offers CD-01U and CD-01U Pro CD players, which fit into 1 RU and are available in two versions: an unbalanced model and a professional model with balanced analog and digital outputs.

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

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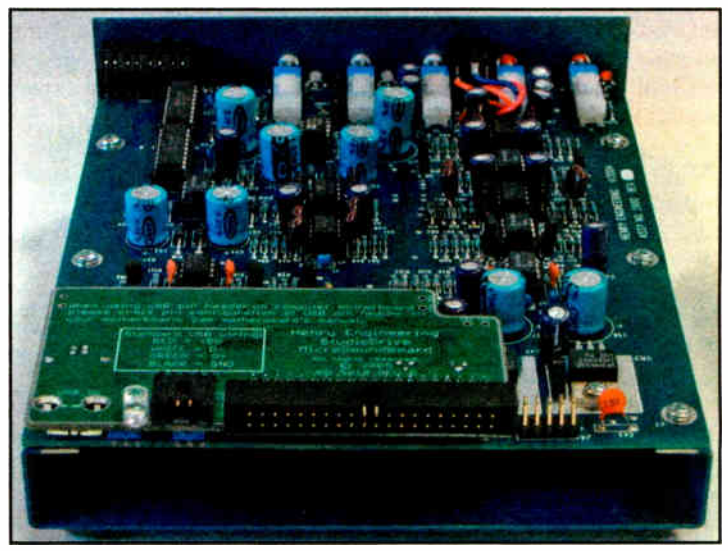
MicroSound Is Henry USB Interface

Henry Engineering's USB MicroSound adaptor is a USB interface for use with the company's StudioDrive integrated PC studio system. It connects the StudioDrive mixer to a PC or laptop computer via USB interface, which Henry Engineering says eliminates the need for a soundcard.

The MicroSound adaptor supports recording and playback with most software at sample rates up to 48 kHz. The +4 dBu analog input and output capabilities of the StudioDrive are preserved, as are the system's operating functions. The company says no modifications to the StudioDrive are required.



The USB MicroSound board is shown installed on the StudioDrive mixer unit. The adaptor plugs into the 40-pin header on the rear of the mixer.

MicroSound plugs into the 40-pin header on the rear of the StudioDrive mixer. The cable from the I/O interface unit then plugs into the USB adaptor. Digital recording and playback to the PC are via the USB interface. The StudioDrive's analog Record outputs remain active for recording on analog devices. The PC plays back via the dedicated PC Input channel on the StudioDrive; the analog PC Input jacks on the I/O interface are disabled.

Connection to the PC may be with the standard USB cable, which is included, or by way of the 4-pin header — on the opposite side of the MicroSound adaptor that connects to the internal USB motherboard connector provided on newer PCs.

The company says the heart of the MicroSound adaptor is Burr-Brown's Delta Sigma Oversampled ADC/DAC, and that its audio performance is enhanced by Henry Engineering's L/C analog filtering.

The MicroSound adaptor is available and retails for $165.

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

World Radio History

TECH UPDATES

HHB CDP-88 Has Analog, Digital I/O

Sennheiser Electronic Corp., U.S. distributor for **HHB Communications**, had debuted the HHB CDP-88 1RU rackmounting CD player. It provides 24-bit Delta Sigma D/A converters, analog and digital connectivity and the ability to sync to Word Clock at any frequency from 32 to 96 kHz.

HHB's CDP-88 CD player

Discs are tray-loaded instead of a front-panel slot, a format the company says can lead to disc scratching and dust contamination. The CDP-88 is compatible with 8 and 12 cm discs, and plays CD and MP3-CD from CD, CD-R and CD-RW discs, with the facilities to play unfinalized CD-R/RW discs and indicate error rates via the front display.

Analog outputs encompass balanced phono (RCA) connectors, while digital outputs include AES/EBU and optical/coaxial S/PDIF. RS-232 and parallel remote connections are provided; the infrared remote control supplied as standard can be converted into a wired remote using a supplied cable for single-player control in multiple-player systems.

The CDP-88 includes a RAM buffer for instant start, a playback shock buffer for uninterrupted operation if the player is bumped and a digital output attenuator that makes it suitable for use as a fallback program source.

Additional features include a fader start interface, track intro and outro display modes, frame-accurate cueing with jog sound, +/- 12.5 percent varispeed and displays for elapsed time, track time remaining and disc time remaining.

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

Zaxcom Deva Offers Multi-Format Recording

The Deva IV hard-disk recorder from **Zaxcom** features multi-disk multi-format recording, sample rate conversion and a 16-channel 96 kHz digital audio mixer.

Multi sample-rate disk recording allows the user to deliver two disks with different sample rates to post. For example, 48000 and 48048 sample rates can be recorded at the same time.

The Deva can be ordered with an optional internal Flash card memory slot. When loaded with 2 GB of Flash memory, Deva records 11.5 track hours of audio without disks connected to the system. This memory is used if the internal hard drive is not available, for example in sub-zero temperatures.

The company touts the color touch screen display. New software features can be added to the Deva, creating additional buttons and controls on the touch screen.

Deva incorporates internal sample rate conversion allowing for simultaneous copies of production audio to be recorded at multiple sample rates. The Deva also records and plays back at non-standard sample rates for various audio applications.

Highlights include eight recording tracks; eight analog inputs and six analog outputs; eight AES I/O; and internal DVD drive. Analog inputs are XLR balanced +4 dB to –60 dB, and 48 V phantom power also is featured. Surround recording is possible with the optional SoundField Decoder.

Zaxcom Deva IV

The Deva IV's sister model, the Deva V, offers many of the same features but has 10 recording tracks.

For more information, including pricing, contact Zaxcom in New Jersey at (973) 835-5000 or visit www.zaxcom.com.

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The same router used by the BC 2000D Console works as a stand-alone router, with thousands of inputs and outputs, summing and processing, with a scalable and modular architecture.

For more information and user references please visit us at www.aeqbroadcast.com

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World Radio History

TECH UPDATES

Denon CD Players Have Cart, Tray Versions

Denon's DN-951FA and DN-961FA broadcast CD players are identical in most respects, except for the tray loading system.

The DN-951FA is the CD Cart version, suitable for use in a DJ booth or control room, where CDs are subject to rough handling. Housed in the Cart, the CD media is protected from inadvertent mishandling, particularly surface scratches.

The DN-961FA is the tray-loading version, which features quick load and unload and is more suitable for environments where CD media is not treated roughly.

A pulse encoder-type rotary selector is used for track search operation. The tracks also can be selected in units of 10 by pressing the selector while turning it.

When the End Monitor button is pressed in standby mode, the end of the track is searched for and the track's ending can be monitored. After monitoring, the standby mode is set and the pickup is set at the play start position. The End Monitor start position can be user-set within a range of 5 to 35 seconds from the end of the track.

The units feature a D-sub 25-pin connector, for connection to the optional Denon RC-680 wired remote control; and a D-sub 9-pin connector for conforming to the RS-422A serial remote control protocol.

Up to 28 configuration selections can be stored in memory to customize the operation of the player according to the installed requirements. Preset choices are stored in non-volatile memory.

The DN-951FA and 961FA retail for $1,600.

For more information, contact D&M Professional in Illinois at (630) 741-0330.

Otari Has DR-100 Digital Recorder

Otari has introduced the DR-100 48-track digital audio recorder with V2.0 software. The DR-100 features MADI digital audio interfacing with 48-track direct remote access via 100Base/T Ethernet and TCP/IP protocol using any remote controller.

The DR-100 supports BWF import/export function and audio data exchange with DAW, and can share audio to/from other PC/Mac computers via network or DVD-RAM discs. The DR-100 processor runs on a Linux-based OS.

Otari this year also announced further development in IEEE 1394-based mLAN professional audio products.

Contact the company in California at (818) 734-1785 or visit www.otari.com.

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Sound Devices 7-Series Recorders Write, Play Files

The two-track 722 and four-track 744T audio recorders from **Sound Devices** write and play audio files with either 16 or 24-bit depth at professional sample rates up to 192 kHz.

The 7-Series recorders use two channels of the company's analog microphone preamps, which the it says are intended for high-bandwidth and high-bit-rate digital recording.

The 7-Series recorders write to WAV files, plus BWF files in the 744T. Audio data files are recorded to the internal hard drive or to user-supplied Compact Flash. For maximum redundancy, both mediums can be activated, providing a RAID-1 level of redundancy to recorded program. Audio files can be transferred via FireWire to a Windows PC or Mac OS computer for post-production or archiving.

Sound Devices 722

The 722 and 744T user interface offers a sunlight-viewable LCD display and LED peak indication per channel. The company says the 722 and 744T recorders excel when used in conjunction with Sound Devices 302 and 442 audio mixers because using the external mixer extends the flexibility of the recorder and gives more audio I/O and control.

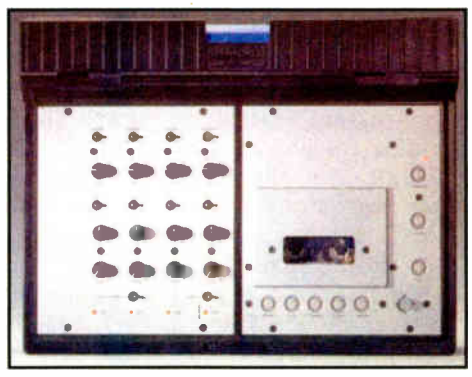
Features of the 722 and 744T include 48 V phantom power and analog peak limiters on channels 1 and 2; adjustable high-pass filters on inputs and first pole in analog; two-channel, balanced mic/line level outputs of Bus 1 on TA3 connectors; and 2.5-inch and 1.8-inch HD compatible internal drive mount.

The 722 retails for $2,650 and the 744T retails for $4,250.

For more information, contact Sound Devices in Wisconsin at (608) 524-0625 or visit www.sounddevices.com.

Sonosax Stelladat Offers Four Mic/Line Inputs

The Stelladat II from Swiss manufacturer **Sonosax** is a two- and four-track DAT portable tape recorder that features four mic/line inputs with mic preamps, input gain control, limiters and low-pass filters. Additionally, it has pan pots and output level controls. The four inputs can be routed to two or four tracks, with or without pan pot, depending on the applications.



Stelladat II DAT Portable Tape Recorder

Stelladat II also has a four-channel input mixer, tone generator and slate mic. It records and plays at 44.1 kHz and 48 kHz, and on option at 96 kHz.

The left side panel has the four mic/line inputs and the analog four line outputs, as well as the monitoring section with MS controls and headphone connector. The right side panel has two digital AES/EBU XLR in- and outputs, and optical in and out connectors for S/PDIF digital signals. This panel also contains XLR and Lemo Time Code in and out connectors.

Stelladat II features an LCD screen for displaying information. The company says signal levels can be controlled to a high degree of precision due to the high-resolution image, and the LCD display is visible in high ambient light because of its transflective nature.

The Tape/Direct, User Prog and Display keys are located to the right of the main level potentiometers, grouping all controls. The Tape Transport buttons are positive detent switches with a molded rubber cover.

On the top panel, the tape transport is located on the right of the four-input mixer. The menu selection is handled with a joystick. For studio use, the tape transport keys are replicated on the top of the recorder or can be assigned functions.

For more information, including pricing, contact Dan Dugan Sound Design in San Francisco at (415) 821-9776 or visit www.sonosax.com.

Sony MD Player Features LP Modes

Sony makes the MDS-JE480 MD player/recorder; it has ATRAC DSP Type S/MDLP/MP3, Hybrid Pulse DAC 24-bit and MD Long Play (MDLP) modes that enable recording up to four times normal capacity. Time Machine Recording also is included, with a six-second buffer memory that captures music up to six seconds before the record button is pressed.

MDS-JE480 MD Player/Recorder

The Jog Dial Control for eases track selection, and Text Entry and Digital Record level control facilitates recording and playback.

For more information, including pricing, contact Sony at (877) 865-7669 or visit www.sonystyle.com.

World Radio History

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World Radio History

USER REPORT

WPOZ Chooses Balsys in Orlando

by Randy Woods
Director of Engineering
WPOZ(FM)/WEAZ(FM)

ORLANDO WPOZ(FM), owned and operated by Central Florida Educational Foundation Inc., is the top-ranked Christian radio station in the Orlando area; the studios also are used to originate programming for WEAZ(FM) and three translator stations covering Central Florida. This is not your average radio station; at least that's our mantra reflecting our goal, namely to be noticeably different as well as the best.

Three years ago we decided to upgrade our On-Air Studio A to a fully digital system. We ordered Harris' BMX Digital console, and envisioned an operational environment for it that was equally high-end. **Balsys Wood Arts** had recently started providing custom broadcast furniture, and as we knew the principals of the company from their earlier involvement in the broadcast industry, we decided to give them a shot.

The User Reports on pages 38 and 40 were intended for the previous issue of Buyer's Guide on Studio Design & Furnishings.

Balsys measured the room and came back in a few days with what looked on paper to be a stunning design. With a couple of tweaks here and there, we gave them the go-ahead. When completed, Studio A turned out to be a beautiful and functional room far exceeding our original concepts and expectations. No factory look; just a custom, unique and one-of-a-kind set of furniture that made our jocks feel like they were working in the top station in New York.

On-Air Studio B

This year we were fortunate enough to be able to upgrade more of the plant, including two existing production studios and one new, much smaller, On-Air Studio B. Each room had challenges, as they are inordinately small for the intended use and there are HVAC ducts and support beams protruding from the walls into the operational areas. Off-the-shelf furniture designs just will not work in rooms such as these.

This time we opted for Harris' VistaMax system, a console with a large footprint. Again, we looked to Balsys to put together a custom layout. The company's proposed designs utilized the familiar look of our Studio A's turret and finishes, and not only adapted shapes and sizes to the room's idiosyncrasies and equipment size, but added some radical curves as well to provide the accessibility clearances and ergonomic layout required for the intended operations.

We again achieved functional rooms exceeding our original concepts and expectations, and again the jocks feel like they are working in a top-market station.

I should add that Balsys advertises with the "This Is Not Your Average Wood Shop" slogan. In our experience, this is an accurate statement. Their innate knowledge of the specific challenges of building for a broadcast application, years of experience prior to forming the present company and application of the latest in technology and automated machinery yield a final product and customer satisfaction that pleasantly exceeded our expectations — twice.

For more information, including pricing, contact Balsys Wood Arts in Florida at (407) 654-7611 or visit www.balsys.com.

TECH UPDATES

Marantz CD Recorders Have 'Minute' Mode

Features of the CDR300 CD recorder from **Marantz** include a "minute track mode" recording feature, which marks each minute of spoken word as a track so that during playback the listener can navigate to a minute-specific track in the recording via track markers, instead of fast-forwarding and rewinding.

The unit is CD-R/RW compatible and includes a mic preamp, 48 V phantom power, limiter and adjustable digital and analog record level.

An optional RPS300 battery system enables users to record up to four hours in the field or have battery backup capability in case of power loss to save recordings.

Highlights include RCA input/output, S/PDIF and the ability to record live directly to blank CDs.

The company's CDR420 CD recorder makes an initial recording to its 20 GB hard drive. Users can edit out silences, put track numbers where they are needed and record long events in MP3 format. Once recording is finished, users can burn a disc as a CD-ROM data disc with a combination of WAV and MP3 files.

CDR300

Audio features include balanced XLR mic inputs with 48 V phantom power, internal mic, analog line I/O and S/PDIF, USB 2.0 and various filters and level control options for signal conditioning. An internal speaker and headphone jacks offer multiple monitoring options. The CDR420 also includes "minute track mode."

For more information, contact D&M Professional in Illinois at (630) 741-0330 or visit www.d-mpro.com.

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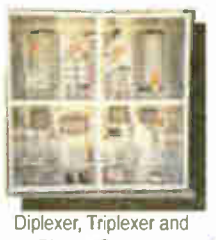

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World Radio History

USER REPORT

WGUC Returns to WSDG for Expansion

Cincinnati Public Radio Addresses ADA Needs With Help of Walters-Storyk Design Group

by Don Danko
VP of Engineering and Operations
WGUC(FM)

CINCINNATI In 1980, WGUC(FM), Cincinnati's Classical Public Radio, celebrated its 20th anniversary with a move from its original home on the University of Cincinnati campus to a 30,000-sq.-ft. building it shares with PBS sister station WCET(TV). To design the 15,000-sq.-ft. radio broadcast complex, station management retained N.Y.-based **Walters-Storyk Design Group**, an architectural/acoustical design firm with extensive broadcast facility credentials.

Flash forward 22 years. At the time, the station had four busy broadcast and operations studios: On-air, two production suites and an interview studio. In addition WGUC has a 2,000-sq.-ft. live performance studio with a 1500-sq.-ft. dedicated mixing studio that is used as a commercial studio for hire to supplement the station's income. With all these facilities constantly in use, a studio expansion was necessary.

With funding in place, we decided that architect John Storyk's initial acoustical and physical design had served WGUC so well that he should design our expansion.

We realized the new studio presented a perfect opportunity to create a completely wheelchair-accessible environment. Having an ADA-ready studio made tremendous sense to us. My philosophy has always been to do things right the first time. For this reason a qualified professional was a must for this project.

The author in the new, ADA-ready studio.

A primary consideration was the location of the new room. The studio had to be located close to the heart of the broadcast facility and had to be big enough to accommodate the soundproof wall design. After careful consideration and preliminary discussions with John Storyk it was decided to convert an existing, centrally located two-person office into a 450-sq.-ft., fully floated studio. The entrance would be at the end of a hallway, which was ideal for a wheelchair ramp.

Eliminating extraneous noise and maximizing available space are primary concerns for broadcast environments. Because our earlier WSDG-designed studios hadn't required sound locks, we were confident that John's recommendation of a 50 STC-rated acoustical wood door would meet our needs. A sound lock would also have been unwieldy for an ADA-compliant studio.

Another of our requirements for the studio was the inclusion of a large 4-foot-by-three-foot window to provide a site line for our frequent studio tours. Visitors range from groups of schoolchildren to wealthy potential donors, and John's recommendation met both our high visibility and STC requirements.

HVAC was an equally critical issue. Because the entire building uses a forced air system, John used a system similar to the one designed by his HVAC expert Marcy Ramos in 1980. Furniture was provided by Harris Broadcasting's Pacific Radio & Engineering, which customized the desk and cabinetry to meet the room's somewhat eccentric configurations.

Because this studio would serve as a backup on-air studio, I tried to keep the studio gear as simple as possible. Rather than loading racks with unnecessary potentially confusing and maintenance-intensive outboard units, we stay with the basics, an ENCO digital automation system, Internet connectivity, mics, headphones and a flat screen monitor ... and yes, a LCD small screen TV. Even a radio station needs a TV to monitor the news these days.

Our new room quickly became a focus for a mushrooming production agenda. On March 11, WGUC purchased WVXU Radio and its affiliated seven-station X-Star Network from Xavier University. Our station President/GM Richard N. Eiswerth explained, "Obtaining a second frequency to better serve both our classical music and news audiences has been a core part of WGUC's ongoing Strategic Plan."

The transition for WGUC's dedication as a full-time classical music station and WVXU's primary focus on news and information has been accomplished, and our WSDG design is critical in accomplishing our expansion mission.

For information contact Walters-Storyk Design Group in New York state at (845) 691-9300 or www.wsdg.com.

USER REPORT

Full Sail School Outfits Expansion

Students Prepped by Simulating 'Real-World' Ergonomics With Middle Atlantic Edit Center

by Darren Millar
Director of Industry Relations
Full Sail School of Film, Art, Design, Music & Media Production

ORLANDO In 2002, the Full Sail School was growing at a rapid pace. Students were coming from all over the nation to gain valuable hands-on experience with some of the newest studio technology. To facilitate this influx of students, it became necessary for us to consider a large expansion — 22 new Avid audio/video editing suites — so the more than 3,000 students who attend our classes would have a chance to work in these suites on an intimate level.

In past instances, our own ergonomic design and construction department have designed and built workstation furniture to facilitate new technology platforms as they were integrated. However, when we began to consider the size and scope of this installation, we began to realize that pursuing custom furniture for this installation might not be the most economical approach.

Typically, custom furniture production can take anywhere from two to three months for the design and construction to be completed. But to turn out 22 high-end workstations, in addition to our other new edit suites, would have been a tremendous strain on our in-house capabilities.

Plotting course

So I and Stella Posada, head of Full Sail's ergonomic design and construction department, set about researching a number of high-quality lines of studio furniture. We also made sure to give careful consideration to each company's track record with regard to reliability as well as adequate industry experience.

We turned to **Middle Atlantic Products**. Its Edit Center line of modular studio furniture had a design that satisfied our ergonomic needs and did so in a manner that would allow us to outfit the expansion quickly and effectively.

The Edit Center line has a unique modular nature that we did not find in other products. Each desk has a spacious, curved work surface that maximized the work area for students, and an overbridge that can hold the required number of monitors at each station: two 19-inch video source monitors and a 13-inch output monitor.

The work that each student has requires him or her to work behind a mixing panel that simulates what he or she will encounter in the real world. The Edit Center desks were nice because in addition to enough space for three monitors at each station, the desks also featured pivoting side bay racks on either side of the workstation.

The Edit Center line features a curved work surface and an overbridge that can hold the required number of monitors at each station.

We were able to install the composer's related outboard equipment in these racks, in a manner that provided sound isolation capabilities essential to a studio environment with so much equipment running simultaneously.

In addition to housing everyday equipment, the furniture gives the students a chance to learn about ergonomics and physical health issues. A majority of our students go on to work in jobs that require long hours behind desks of this type. What we are able to show them with this advanced-design equipment is the proper way to setup up equipment, as well as a workspace, and efficiently maximize this space.

For more information, including pricing, contact Middle Atlantic Products in New Jersey at (973) 839-1011 or visit www.middleatlantic.com.

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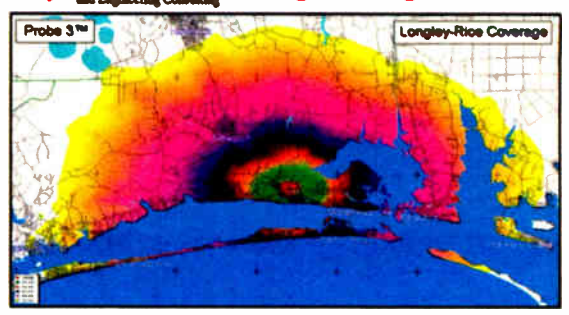

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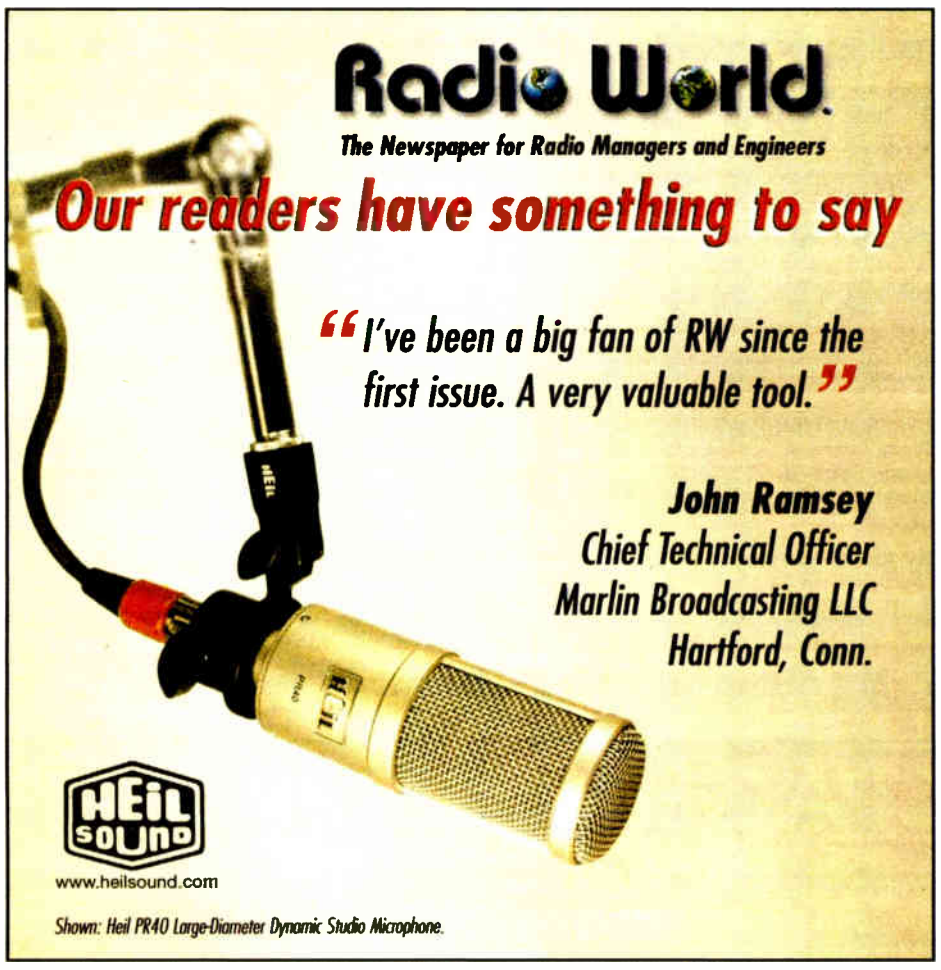

The Great Communicator

The "CD" letters on the bright yellow Gonset Communicator II (*Reader's Forum*, May 13) stand for Civil Defense, not CONELRAD. The yellow cabinets were produced exclusively for the U.S. Civil Defense program by the Gonset Company in Burbank, Calif. Nevertheless, thanks for posting the picture.

Thousands of Communicators were produced and were used in a variety of settings including amateur, military and aviation. Just a few years ago, the FAA Western Region Office advised me that they had retired their last Communicator as a control tower radio. Not bad for tube-type transceivers produced circa 1955.

My father founded the Gonset Company. He and his father had favored a diamond-shaped logo for the company, and "Gonset" fit better inside the diamond than our family name of "Gonsett." And so it was, Gonset in business and Gonsett in our personal lives; and that complimented many years of happy memories from producing state-of-the-art equipment for its day.

Gonset manufactured many products, by the way. Sears TV receiving antennas of the 1950s were Gonsets, and so was open-wire transmission line used to connect some of those antennas, like the "Radar Ray" and "Rocket," to TV sets located in deeply shadowed canyons — all fascinating and magic technology before the advent of cable TV and satellite.

Bob Gonsett, W6VR
Fallbrook, Calif.

Shifting Platforms

I think the FCC has made several mistakes in the past that hurt MW broadcast.

Mistake No. 1: When the FCC should have said, "No new full-time MW broadcast stations," they instead said "No new daytime-only stations." Now we have severe interference because of that incompetent decision.

Mistake No. 2: The FCC studied "AM" stereo for several years before deciding that the "Magnavox" system was superior and therefore the system that must be used. Then, wanting to impress President Reagan (it is called brown-nosing), the FCC decided to let the "marketplace" decide. Letting the marketplace decide means to letting those who have the most money decide, regardless of whether it is good or bad for the rest of us.

Motorola decided to dump money into promoting their system in hopes of having their "platform-shifting" or CQAM system adopted. I wonder how much Motorola lost on the deal. If I were a Motorola stockholder I would not be happy. I wish Motorola would push their Symphony chipset (DSP) as hard as they pushed the platform-shifting "AM" stereo system.

Mistake No. 3: In 1989 the FCC decided to cripple "AM" or MW broadcasters by no longer allowing them to have the same audio frequency response as FM stations still have. The FCC should have restricted the new rule to nighttime and critical hours only so at least we could have good audio in the daytime.

I wonder why the FCC is trying to destroy "AM" broadcasting? I would like to change the way things are done with "AM" broadcast.

First, I would make the rule limiting frequency response a nighttime- and critical hours-only rule.

Second, I would make all MW stations that were daytime-only or not on the air by Jan. 1, 1975 go daytime-only, or would use other frequencies. By other frequencies I mean 25.600 MHz to 26.100 MHz for nighttime operations.

The nighttime-only operations would be low-power, 1,000-watt stations with antennas high up on towers so they could reach the listeners' antennas like a VHF FM station would. No new full-time stations would be licensed except to replace stations that were on the air 30 years ago and have for some reason other than interference have gone dark.

Third, I would not allow digital MW stations to interfere with analog on adjacent channels. If a MW station wants to be digital then it should just be digital and should not transmit on frequencies that wipe out adjacent channels, such as KFXR of Dallas interfering with WOAI of San Antonio.

James Johnson
Arlington, Texas

How to Screw Up AM

Thank you, Marvin Walther. I couldn't agree more with him on the issue of 5 kHz AM audio ("Don't Kick AM Radio When It's Down," June 22).

Here in Houston, both of the all-sports AM outlets have reduced their audio bandwidth. During a loud crowd portion of the games, all you hear is *noise*. You can't understand the announcers because the S's, T's and other high-frequency letters of speech get filtered out and it sounds like sibilance. Now try listening to this on the road at speed.

I fear the main reasoning for this is not the protection of adjacent fellow broadcasters, but rather to sneak up the average positive peak modulation past the allowed 125 percent. This gives them loudness without the sideband interference.

AM radio is such a great band. It's just too bad the FCC has thrown the baby out with the bathwater by allowing it to become overcrowded. Roll back the rules to the pre-expanded band era when regionals were only permitted a maximum of 5 kW, and locals a nighttime power of 250 watts (500 max).

The Class C AM frequencies are a classic example of how to screw up AM radio. Ever try to listen to a Class C at night more than 10 miles from their tower? You can't; too much skywave from co-channels. Class Cs need to get together and voluntarily reduce nighttime power to at least 500 W max.

Robert Heiney
The Woodlands, Texas

World Radio History

◆ READER'S FORUM ◆

'A Fundamental Truth'

It's been fascinating to read the debate about IBOC, particularly Ibiquity's proposed AM system, since I wrote to RW to sound a warning about its implementation last October (*Reader's Forum*, Oct. 6). RW deserves kudos for publishing both viewpoints on this hugely controversial issue.

Since my first letter, I have had the opportunity to do some critical listening to stations in our local Rochester, N.Y. market and others that are using the system. Last year I expressed my concerns about adjacent-channel interference to other services. And, given my recent experience, let me be the first to say: I was wrong.

Actually, the problem is far worse than I feared — but more on the technical issues in a moment.

Our industry has to focus on a fundamental truth: Technology alone never drives listening habits. IBOC's cheerleaders who declare that 34 kbps digital stereo will save AM from extinction are living in a fool's paradise.

Does anyone remember the debacle of AM stereo? How about the 35 years it took for FM to overcome AM as a music vehicle? Or how it's taken 10 years of frenetic promotion and an FCC with all the finesse of a drunken rhino to put over broadcast HDTV? AM broadcasters would be well advised to first put their programming house in order.

Here's the huge IBOC problem. Notwithstanding all the soothing data its promoters chant, in practice, AM stations operating with Ibiquity's AM IBOC system throw a deafening buzzsaw of noise a minimum of 20 kHz either side of the assigned carrier frequency, which makes a mockery of the RF mask Crawford Broadcasting's Cris Alexander has correctly cited as part of the regulations at Section 73.44.

If WYSL's analog signal threw noise like this, the FCC would cite us. Are we proposing a de facto rule exception solely to benefit IBOC stations at the expense of others?

WYSL provides a valuable service, daytime and nighttime, with a unique all-news and sports format. We utilize 500 watts and a four-tower DA at night to serve the Rochester metro from a community 20 miles away — and do a damn good job of it, if I may say so. Skywave interference from adjacent-channel stations operating at night with IBOC would effectively return WYSL to daytimer status.

When Mr. Alexander blithely dismisses such facilities as WYSL's as "always (having) been at a disadvantage" and suggests "now is the time to push past such disadvantages and embrace our digital future" (*Reader's Forum*, March 2), he's really advocating that big groups such as his be given the okay to steamroll smaller operators, destroying our ability to compete, provide jobs and earn a living.

One wonders how Mr. Alexander would react to such a proposal directly affecting his livelihood. Or how WOR's Tom Ray would feel about a technical scheme that would prevent his New York-licensed AM from selling ads in Connecticut, New Jersey, Pennsylvania or Upstate. After all, his is a "New York City station," not "entitled" to coverage elsewhere.

Then, there are the calls we've received at WYSL from listeners asking, "Why does your competitor (the Rochester-metro IBOC AM station) have that nasty hiss on its signal that appears every morning?" And, because we share the local baseball broadcast schedule with an IBOC station, we always get complimentary calls from listeners who are relieved to be able to listen to the game at the ballpark without having to put up with the frustrating encoding delay.

How can radio, as an industry, simply ignore how the Ibiquity system degrades existing service like this? Can we be so naïve as to believe the listening public will put up with it?

And, in closing and in reaction to Mr. Hal Widsten's claim that AM IBOC has gained "approval of the FCC" (*Reader's Forum*, March 2), it should be noted that the commission has *not* approved it for nighttime use at this writing. Given the body of field experience, there appears to be a very good reason.

Robert C. Savage
President/CEO
WYSL(AM) News 1040
Avon, N.Y.

'It' Happens

Well, "it" has finally happened out here in the prairies of the upper Midwest. The "it" to which I refer is the disease known as AM IBOC.

KFAN in Minneapolis operates on 1130 and has fired up IBOC digital. I live 120 miles south of the cities and can no longer hear anything on 1110, 1120, 1140 and 1150. Well, nothing other than KFAN's digital hash.

As a matter of fact, heading toward Des Moines, which is about equidistant between Minneapolis and St. Louis, it is almost impossible to listen to KMOX another 50 kW out of St. Louis on 1120 because of the noise from KFAN 250 miles away!

I am not blaming KFAN and am certain that they are running entirely "by the book," but I am saying that this system really stinks. Why do the analog guys have to adhere so strictly to the NRSC mask when the digital crap can take out five channels and be totally legal?

If this isn't straightened out either by a "fix" or by ceasing all digital transmissions, AM is dead and not just a little. If this goes on and all the AM stations wind up with this flawed system, no one will be able to hear anything more than a mile or two from the transmitter site.

Imagine operating on, say, 1470 when all the locals on 1450 and 1490 are transmitting digital. If I owned a station on 1470, I would be looking for a buyer *right now*, before I start hearing digital hash on my studio monitor.

Maybe the commission should let the AM band go the way of CB — no licenses, a free-for-all. With all the noise, it won't be worth much anyway.

Ron Schacht
Kensett, Iowa

What the Customer Wants

"If you've just developed a great product, your goal is to develop a better one that will make the first one obsolete. If you don't make it obsolete, someone else will."

These words by Don Tapscott from "The Digital Economy" should be a rallying cry for broadcasters. When radio first appeared, early in this century, it offered a service that people had never experienced before — and it quickly evolved to give listeners an experience they wanted.

Today, the service once provided only by radio is being offered by and improved upon by many sources. Satellite, podcasts, 3G cell phones, broadband and wireless Internet are vying to provide services designed to provide a new, better or unique experience.

The question that we broadcasters must ask is, "How do we (make) obsolete our product?" The future success of local broadcasters lies in fundamentally rethinking the service we provide. We need to look to the market to see what people need and want from us. We must think from the customer's point of view. We need to liberate ourselves from everything we know about broadcasting and all the terms we use.

Our focus should be on the experience the customer wants. When we understand that, then we can design and implement the business models and technical systems necessary to serve this need.

The broadcast industry has a history of investigating technical enhancements without due regard for what the customer desires and values. We are focused on the dynamics and history of our own industry, and are fearful of radical change. Perhaps the broadcast industry has failed to notice the speed with which other industries develop, launch, harvest and obsolete their products. What is the best investment of our time, talent and capital? Should we continue to invest in tactical changes when we do not even know if the customer will benefit from them?

The broadcast industry must act now. We must determine the experience our customers want and develop the means of providing it. If we fail to understand what our customers want, or if we fail to deliver it, then we can be certain that somebody else will.

Andrew Dickens
Austin, Texas

Domestic Distribution

In a recent user report on the Audio TX STL-IP codec by Edward Dulaney of Crawford Broadcasting ("STL-IP Also Suitable for Remotes," Aug. 3), one of the "thumbs down" in his report is that there are no U.S. distributors.

I understand that at the time the article was written, ATA was not the exclusive U.S. distributor. However, you should be aware that since May 2005, ATA Audio is in fact the exclusive U.S. distributor of the Audio TX STL-IP codec. We offer full service and support for the unit.

Visit *www.ataaudio.com* or call (973) 659-0555 for more information.

Alvin Sookoo
President
ATA Audio
Randolph, N.J.

Webcast Coverage

I'd like to thank James Careless for his excellent article on Beethoven Radio ("Beethoven.com Hangs Tough," March 2). I'm glad that Radio World has expanded its coverage of the webcast industry.

Designing and building the Beethoven facility for Marlin Broadcasting back in 2000 was a unique experience. Beethoven Radio was my first Internet-only facility and it was strange driving home the day we put the station on the air, and reaching for the car radio by habit to listen to the new station.

Of course I couldn't hear it since it was web-only. We remedied the situation about a year later when we started simulcasting the programming on our AM station, WTMI, 1290 kHz in West Hartford, Conn.

Another interesting issue that webcasters face is that there is no such thing as "drive time" when you have an international audience spanning well over a dozen time zones. For example, in the late morning Eastern Time we see the number of users increase well into the thousands as the west coast comes online and the numbers of listeners remains high late into the evening.

John Ramsey
Chief Technical Officer
Marlin Broadcasting
Hartford, Conn.

From left, Nicole Godburn, program director for Beethoven.com, Holden Johnson, production director and Scott Birmingham, on-air midday host. The big guy in the middle is the composer himself.

World Radio History

◆READER'S FORUM◆

'Myths' or Marketing Tools

I'm wondering if anyone else feels as I do about the self-serving promotional article from the RAB ("Eight Major Myths About Radio," June 22). It created the image of a desperate bunch of old war-horses sitting around the conference table telling stories of the good old days while trying to go forward by looking in a foggy rear-view mirror.

Personally I was offended. It dispelled no myths that might help refocus any radio station, and the facts presented are useless to today's troubled radio industry, which is being savaged by terrific alternative technologies and forward-looking entrepreneurial drive.

When talking to the 18-49 demographic, you will find them willingly receptive to today's mantra that "Perception *is* reality." Whether right or wrong, their perception of reality is that technology is the force changing almost every aspect of our lives, especially the media and communications they so easily embrace. Traditional radio has not willingly embraced these changes to survive, and the RAB's "myths" do absolutely nothing to help, providing valueless straws while the foundering radio ship needs a lifeboat.

Can radio survive this onslaught of advancing technology? Yes it can. But will it ever be the same again? No, it won't. Can it recapture the 18-49 demographic that spends most of its disposable income on techno-gadgets? Only by considering techno-orientation, and willingly stepping out on the risk platform.

Let me briefly comment on each of the "eight major myths about radio."

Clutter: Addressing this issue is only a reaction to part of the overall problem. A beginning, yes, but not information that helps long-term survival. Easily seen for what it is. It's a straw.

Not Innovative: Nothing innovative here. Can't fool the 18-49ers. Again, companies reacting to technology by jumping on board a fast-moving bandwagon. Does nothing to help the industry, but a lot to help entrepreneurial radio conglomerates willing and able to take risks. Infinity and Clear Channel both have shown they will embrace technology to force change within their organizations. Subsequently, the radio industry will capitulate and follow out of necessity.

Youth Market: Useless information that doesn't address the changed values of its audience. Just more backward-looking facts not worthy of discussion. Say, didn't Kaiser once make a car?

Creative: More self-serving insider response. But there's Clear Channel mentioned again. Maybe these big companies are doing something of value after all? Remember, you can't argue with success. Bank deposits and investor confidence are always a good sign you're moving in the right direction.

Not a Branding Medium: Who thought up this one? And hey, these are *big* advertisers that are shying away from many radio markets these days and switching to alternative delivery formats. It's the local advertisers that pay the bills. Another straw.

Declining Listenership: These facts don't stand up to many other studies. Advertisers would be sticking with us if these were responsible dollar-supported facts. Ah yes, another straw from the RAB boardroom.

Commercial Length: Ok. This one works. Yea!

Schedule Integrity: This does nothing to help the industry. It only shows that a few techno-driven companies are using technology to their advantage. Where does this help anyone in radio beyond this specific group?

Clarity of vision is mission-critical. If you want to understand your market, your competition, your technology, your advertisers, your support systems, your audience, your leaders and your future, then stand back, take a good look at your available resources and don't be openly re-active and defensive.

Treat your audience to functionally usable information, assume they have intelligence, approach them accordingly and figure out how to become pro-active with them in a changing industry.

Bob Heckler
Broadcast Radio Services LLC
San Diego

'Strange Transition'

Why is radio, with an assist from its friends over at the FCC, so willing to fully load a gun barrel, take the safety off, aim at its foot and fire?

Broadcasting is one of the few media out there that insists on making wholesale changes to its method of delivery whether or not the change is detrimental to its consumers. In the age of the compact disc, one can still find LPs out there, yet radio is quick to do all sorts of things that will only succeed in alienating its listenership — like ramming AM bandwidth reduction down everyone's throat (thus rendering high-end, expensive wideband AM receivers useless) while simultaneously cluttering up the good signals that do exist with sideband HD.

In general, radio has undergone a strange transition into "bizarro world" over the last 15-20 years. It wasn't too long ago that PDs, GMs and their engineers would tweak their station with all sorts of compressors, limiters and secret "gadgets," trying to give themselves bigger sounds than their competitors. They took pride in having punchy, booming, impossible-to-ignore audio that reached out and grabbed you while you drove around in your car, lie on the beach, enjoyed a picnic or sat at the kitchen table doing your homework.

Now, stations are falling all over themselves to get the cleanest, most digital and flat-sounding audio they can. Somewhere, the idea of radio as an entertainment medium, and high-end hi-fi equipment got confused with one another, and the end result may be station after station that will sound identical and antiseptic — like some strange Orwellian-Kubrick vision of a sterile, white room filled with men in lab coats playing CDs and computer-generated top-of-the-hour IDs.

Pete Cipriano
ABC Radio Networks
Technical Services
New York

But What About the Engineers?

Last month, Beasley Broadcasting Group announced winners of its Annual Operating Awards, which recognize noteworthy achievements, operating success and contributions. Awards were given for Market Manager, Sales Manager, Program Director and Radio Station of the Year.

The company press release stated that the winners had helped to "consistently exceed internal cash flow growth targets," "grow revenue faster," "expand market share" and "transform ratings performance into double-digit local and national sales increases."

These positions are vital to a broadcaster. But the omission of an award for Engineer of the Year is conspicuous. Stations cannot exist without their infrastructure. Did no engineer at Beasley excel or contribute to the company's success?

A company official confirmed there is no such award at Beasley. Sadly, we find that's not unusual.

Too many broadcasters continue to overlook engineers when it comes time for doling out the money, praise or access to decision-making.

Not long ago we pointed out that radio companies rarely, if ever, issued announcements about the achievements of engineering staff despite our industry's foundation in technology. We encouraged groups to do so, and we've seen some results. But such efforts remain the exception, not the norm. Broadcasters have a good deal of room to improve in recognizing commitment to technical excellence and acknowledging that engineering is among the pillars of a radio station.

On the other hand, Clear Channel, for the second year, recognized engineers who have done outstanding work. They are: for Major Markets, Bob Stroupe, Houston; Large Markets, Greg Savoldi, Columbus, Ohio; Medium Markets, Matt Howell, Sarasota, Fla.; and Small Markets, Charlie Wooten, Panama City, Fla.

We'd love to report the names of radio engineers honored by other station groups. Your station's GM, DOE or PR person need only drop us an e-mail to *radioworld@imaspub.com.*

One enlightened employee can make the difference in establishing practices like this. And directors of engineering shouldn't feel they must wait on CEOs to suggest such programs.

As the industry pursues a conversion to digital, good broadcast engineers are more important than ever. Ownership needs to do a better job at recognizing them.

— RW

Sense and Responsibility

Several e-mail responses from all over the nation, from people I haven't seen or talked to for years, attest to the power of Radio World. Thank you for putting the article in the paper ("Small Town Produced Big Radio," July 6), and for your continued good work keeping us up-to-date or entertained.

Radio World performs both functions with a sense of responsibility.

Don Kennedy
Atlanta

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