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HD Radio Data

Paul Signorelli questions how open Ibiquity's 'open source' really is.

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Split Digital

Field testing begins in four cities on the 'Tomorrow Radio' project.

In HD Radio News

Radio World

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STARLINK BANDPASS

Translator 'Flood' Causes Concern

by Naina Narayana Chernoff

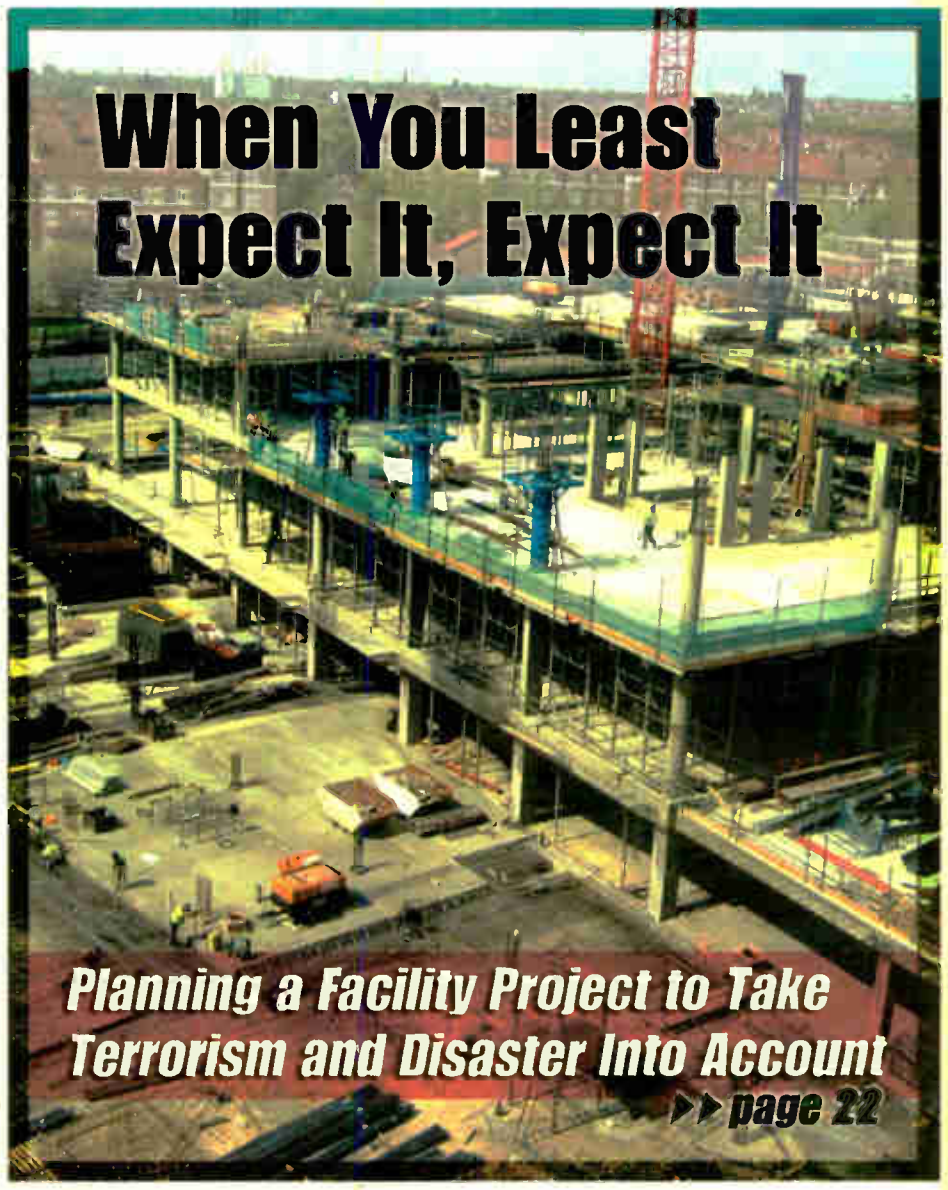
WASHINGTON A torrent of applications received this year by the FCC for new FM translators is causing some broadcasters and engineering consultants to worry about potential interference to existing stations.

When it accepted applications for translator frequencies this spring, the FCC received approximately 13,000 requests. Commission staff believes those applications demonstrate high demand for translators.

The auction filing window, never before conducted for FM translators, could produce more authorizations than the commission has allowed in more than 20 years, experts say. Auctions will be held only for those frequencies that are contested. It's unclear which frequencies would be auctioned and when; several procedural steps remain.

An FM translator rebroadcasts the signal of a primary FM station on a different frequency, typically to fill in coverage. Roughly 3,650 FM translators were

See TRANSLATORS, page 6 ▶



DIGITAL NEWS

U.K. Groceries to Sell Eureka-147 Radios

LONDON Along with their eggs, tomatoes and other food, shoppers in the United Kingdom will soon be able to buy Eureka-147 digital radios. Supermarket chains Tesco and Sainsbury's will stock DAB digital radios over the next few months. Sainsbury's plans to roll out the units in 125 outlets and Tesco in 17 stores, according to the Digital Radio Development Bureau, a group that markets Eureka-147 radio in the United Kingdom.

Ian Dickens, chief executive of the Digital Radio Development Bureau, stated: "The fact that two of the U.K.'s supermarket brands have seen the potential for DAB digital radio is a clear sign that the transition from early adopter to mass-market take-up is underway.

The group claims consumer awareness of digital radio in the U.K. is at 30 percent, and that the number of retailers stocking Eureka-147 radios has grown from 600 to more than 3,000 in one year.

XM, Boeing Agree On Fourth Launch

WASHINGTON XM Satellite Radio and Boeing have agreed to launch XM's fourth satellite in the 2006-07 timeframe. The XM-4 would be sent into geosynchronous transfer orbit on a Sea Launch rocket.

Sea Launch placed XM's first two Boeing 702 satellites in 2001 and will launch the XM-3 in late 2004 or early '05 as part of a delivery-in-orbit contract with Boeing Satellite Systems, the manufacturer of the four birds.

The satellites normally have a 15-year life span. XM is arguing with its insurer over a $400 million claim for the shortened life span of its first two satellites due to a flaw acknowledged by Boeing in the solar array. XM executives said while its satellites provide excellent performance, they continue to experience progressive solar array power degradation, like other Boeing 702 satellites in orbit.

The satcaster said it would will respond to the insurers and proceed to settlement discussions, arbitration or litigation as needed to recover the insured losses.

XM said the design flaw has been fixed for its third satellite. That launch is expected to cost about $190 million.

Alcatel Space is providing the S-band Digital Audio Service payloads for the XM spacecraft.

XM's Losses Grow, Sub. Costs Down

WASHINGTON XM's losses in the second quarter grew over this time last year due to extra insurance expenses, but the satcaster says it is getting more revenue from subscriber growth and paying less to get those customers.

XM's net loss before interest income, interest expense, depreciation and amortization was $95.8 million for the second quarter of 2003, compared to the EBITDA loss of $78.7 million in the second quarter of 2002.

XM President and CEO Hugh Panero said XM remains on track to reach "cash flow break-even" in late 2004 and that quarterly losses are to be expected from a rapidly ramping growth business.

It now costs the company less money to add subscribers. Average acquisition cost for the second quarter was $80 per subscriber as compared to $132 for the same period last year. Its "cost per gross addition" including advertising and marketing was $160 per subscriber compared to $591 in the second quarter of 2002.

As of June 30, 2003, XM had $345.9 million in cash plus undrawn credit and equity facilities from GM of $114.4 million.

Sirius Operating Loss, Total Revenue Grow in Q2

NEW YORK Although Sirius has more revenue coming in the second quarter, it's operating losses grew as well, compared to Q2 of last year.

See DIGITAL NEWS, page 5 ▶

'Tom' Is New Weather Radio Voice

by Randy J. Stine

SILVER SPRING, Md. What's in a name ... or a voice, for that matter?

The new computer-synthesized broadcast voice of the National Oceanic and Atmospheric Administration's Weather Radio reports uses the same technology as its predecessor but is capable of reading with varying speed and intensity to convey the seriousness of an urgent weather warning if necessary.

"Tom" replaces "Craig" and will share voice duties with "Donna" as the automated voices for the weather service daily forecasts and advisories. The text-to-speech computer voices are concatenated; small bits of a real human voice are rearranged and put together to create new words.

With text-to-speech technology, meteorologists type their reports into the computer, which renders the words into a voice for broadcast. The NWS says the technology allows weather offices to issue more timely reports.

Children of Perfect Paul

NOAA introduced its first computer-driven voice in January 1997 as part of a $13 million effort to automate the agency's nationwide network of weather reports, forecasts and emergency weather alerts. NOAA now has had several generations of voices. "Craig" and "Donna" replaced "Perfect Paul" in 2002.

Boston-based SpeechWorks International developed the latest voice upgrade, which included software to improve the quality of the Donna voice. Tom made its debut on 121 NOAA weather stations in the United States in July. Software developers awarded a contract in 2001 to Siemens Information and Communication Network to develop the text-to-speech software for Craig and Donna. SpeechWorks International provided the artificial speech technology that combines phonetic sounds with natural language modeling. That contract was valued at approximately $634,000. Lehmann declined to put a price tag on the most recent upgrade.

The NWS has been sensitive to complaints from broadcasters about the computerized weather voices, Lehmann said, and remains in a constant "evaluation process" with the voices. Improvements in the commercial software product used by NWS warranted the most recent change.

"Certainly there have been some complaints. But when we undertook the Console Replacement Program in 1997, we decided to use commercially available products instead of funding someone to develop a new system for us," Lehmann said. "The quality certainly is getting better."

Critics of the synthesized voices complain that they can be hard to understand and monotonous. Many claimed the robotic-sounding Paul even sounded faintly Scandinavian.

Dave Edwards, chief engineer for the Citadel Communications Corp. cluster in Syracuse, N.Y., said, "(Tom) is definitely an improvement and fairly acceptable for airing weather emergencies. But he shouldn't quit his day job."

You say 'tomato' ...

Some broadcast engineers say the new voice, while a good deal faster than Craig, still requires some minor tweaking.

> Tom is more natural, with more intonation in the pronunciation.
> — Larry Lehman, NOAA

called the new male voice richer and more animated.

Larry Lehman, NOAA voice improvement project program manager, said, "Tom is more natural, with more intonation in the pronunciation. The speed variance can be used to convey the importance of a weather warning."

That speed versatility means NWS meteorologists in different geographic areas can customize Tom and Donna to better suit the listening audience.

"It's a generalization, but true, I think, that people in the Northeast tend to talk faster than people from the South."

Lehmann, an engineer with the NWS, said the upgrade fixed another program glitch.

"Whereas Craig and Donna shared a single pronunciation dictionary, which meant they would sometimes mispronounce words, now Tom and Donna have individual dictionaries."

The Commerce Department, which oversees the National Weather Service, advisories are still subject to being reduced to gibberish due to the inclusion of typos, punctuation errors and misspellings.

"While the forecasting itself is more accurate than ever, the greatest liability in the system is the least likely to get any corrective attention, and that is the feedback loop that brings the forecaster in the regional NWS office in contact with the finished product," Scott said.

Until 1997, real meteorologists taped weather broadcasts that were repeated over and over. In cycles of three to seven minutes, Weather Service Radio provides the time, temperature, wind speed, barometer readings and weather synopsis and forecasts, along with severe weather statements.

NOAA Weather Radio, sometimes referred to as the voice of the National Weather Service, is a portable device that enables the public to receive continuous weather broadcasts and weather alerts from local weather broadcast offices over a network of 600 stations nationwide.

The NWS recently introduced a Spanish-speaking computer-generated voice nicknamed Javier in 13 regions with large Hispanic populations, Lehmann said.

Weather radio products come in various shapes and sizes.

Corrections

A story that ran May 22, 2002, and was archived on our Web site until recently stated that WRNC(AM), Macon, Ga. operates at 10 kW at night. The correct nighttime power level for the station is 1 kW.

The Aug. 13 issue featured an item on page 22 about the JK Audio Broadcast Host Digital Hybrid. The price was misprinted. The correct retail price is $495.

We Give You Bisset, and More

From the Editor

Paul J. McLane

"You don't write because you want to say something; you write because you've got something to say."

The words belong to F. Scott Fitzgerald. He would be a good editor of Radio World, with an attitude like that.

I call your attention to a new series of photo boxes that appear in our pages from time to time, such as the one on this page. I've decided to give you a bit more insight into the fine writers whose work has graced our pages for the past 27 years. This also is my way of saying thank you to the superb radio professionals who make Radio World possible. People like John Bisset.

Together we hope to give you something worth thinking about every two weeks.

The cause is a noble one. Edward Abbey described it best.

"Why I write: Not so much to please, soothe or console, as to challenge, provoke, stimulate, even anger if necessary — whatever's required to force the reader to think, feel, react, make choices. Such is my aim."

Such is our aim, as well.

★ ★ ★

Is the HD Radio codec problem fixed? Smitty seems to think so. Calling the codec issue resolved, Milford Smith, the DAB subcommittee chairman at the National Radio Systems Committee, said recent demonstrations of the Ibiquity system incorporating the new HDC codec were well-received by steering committee members. So now the NRSC has decided to restart its standards-setting process for HD Radio.

I'm glad. Clearly, only pressure from the NRSC caused Ibiquity to change its codec plans. The standards system worked in that regard.

But I carry a big red flag in my hand whenever I discuss HD Radio these days.

The last few months have seen too many potholes in radio's digital ramp-up. The mishandling of the codec situation by Ibiquity leaves a sour taste in many mouths. The continued use of private rather than public demos and discussions by both Ibiquity and the NRSC continues to cast a pall over the proceedings.

In my view, the company and its supporters now have one chance to do this right. Don't drop the ball now, guys, *please*. Don't hurry this through or accept any compromises. Don't hide your work behind signs on the door saying "Private." Our healthy skepticism will turn to cynicism soon.

The NRSC should continue to be as hard-nosed as it can. Let's not find ourselves looking back on the years 2002-2004 as the time when radio botched its digital rollout. Too many stations and too many other parties have too much at stake.

★ ★ ★

Isn't it interesting to see Michael Powell suddenly embracing low-power FM as a way to ensure more localism?

The chairman said the FCC will focus on getting more LPFMs on the air. It intends to open a settlement window for applications; the agency will waive its processing rules to permit multiple applicants who applied for one frequency to apply for different frequencies.

Hundreds of applications are pending, one official said. Apparently, when applicants used the "frequency finder" supplied by the FCC, many simply chose the first frequency listed for their area, leaving other slots with no takers. The commission is trying to distribute applications more evenly among available frequencies.

This is one of several initiatives announced by the commission as it struggles to undo the nasty perceptions raised by its June 2 vote on ownership rules. The timing and positioning of the announcement demonstrate how far this chairman will go in making decisions as a result of political pressure, all the while proclaiming that politics has nothing to do with it.

I think it's hilarious to see Powell, who has let the LPFM topic slide into obscurity over the past two years, now putting it front and center. Maybe next, Powell can bring in Bill Kennard as a consultant.

In fact, this chairman apparently has made a discovery. He told reporters in August that the recent debate had revealed a "deep-seated anxiety" on the topic of media ownership among Americans.

As a friend of mine used to say when we were kids: "Well, duh."

WE GIVE YOU BISSET

Name: John Bisset

Occupation: District Sales Manager for Radio, Harris Corp.

Experience: 34 years in the industry. SBE Certification; presenter of NAB Transmitter Workshop; speaker at numerous conventions; contributor to NAB Radio Handbook

Mentors: Lamar Newcomb, Ray Gill, Steve Dana, John Cunningham, Charlie Wright, John Mullaney Sr. and Jr., Mitch Montgomery, Morgan Burrow, Jim Weitzman, Alan Pendleton, Morris Blum, Milford Smith, Tom Giglio, Scott Beeler.

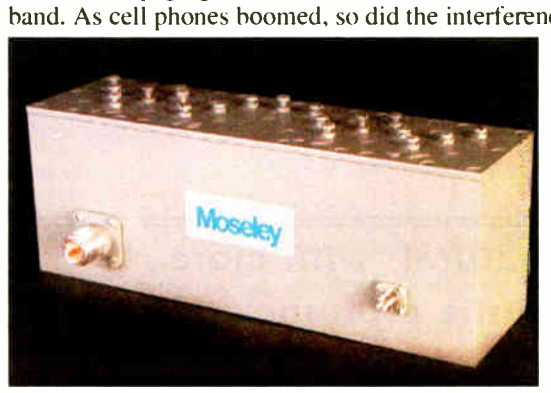
Favorite memories: Early days of AM improvement; demonstrating the Splatter Monitor to the FCC with fellow Delta employee Tom Wright; development of *Workbench* into RW's most popular feature.

Quote to live by: "Few things are more persistent and intimidating than our fears and our worries ... especially when we face them in our own strength." — Swindoll

Radio World's pages are home to the finest writers and columnists in the industry. Like John Bisset. Just one more reason we're the newspaper for radio managers and engineers.

Congratulations to Vicki Holloway, station manager of KETR(FM), "The New Lion" at Texas A&M University in Commerce, Texas. She wins a Moseley Starlink Bandpass Cavity in our New Technology Sweepstakes.

Almost all near-field RF interference at STL transmitter sites is from cell or paging transmitters that are not located in the 944-952 MHz STL band. As cell phones boomed, so did the interference possibilities at any given site.



Moseley makes a filter that rejects everything outside the STL band by –65 dB. It's a simple solution for a current interference problem or a useful precautionary measure on a new installation. Retail value: $575.

You can sign up for the contest, which runs through the end of the year, at *www.rwonline.com*.

◆ NEWSWATCH ◆

LPFM Key to FCC's Media Localism Plan

WASHINGTON FCC Chairman Michael Powell has embraced LPFM.

Faced with the wrath of members of Congress and the public over ownership rules and specifically media concentration, Powell announced a series of initiatives to make sure broadcasters live up to their public service obligations.

One priority is to get more low-power FMs on the air, to increase the number of locally owned stations. The commission intends to open a settlement window for LPFM applications. It will waive certain processing rules to permit multiple applicants who applied for one frequency to apply for different frequencies, resolve conflicts and go on the air.

Media Bureau Deputy Chief Robert Ratcliffe, co-chair of a task force to study media localism, said the action was not based on a recent report from Mitre Corp. The report (RW, Sept. 1) implies that by lifting third-adjacent-channel protections, regulators could safely allow more LPFMs on the air. Comments on the report are due Sept. 12.

Hundreds of LPFM applications are pending, Ratcliffe said. When parties used a "frequency finder" on the FCC Web site, many simply applied for the first frequency on the list, leaving other channels without applicants. The FCC hopes to distribute the applications more evenly.

Several of the FCC initiatives were first raised during the 18-month review of ownership rules that culminated in the June 2 vote. Asked why he was initiating the actions only now, Powell said the commissioners heard concerns throughout the media ownership debate.

"In the process, we learned about a deep-seated anxiety" among Americans, he said. The challenge was to translate those concerns into constructive rules, Powell said.

"If we mean it, no one should be afraid of looking at it more directly and that's not what we did earlier."

Powell defended the new ownership rules and said he would not delay their implementation. He also said the media localism initiatives are not a political strategy.

'Too Little, Too Late'

WASHINGTON Reaction to new initiatives by the FCC (see previous item) to ensure media localism was mixed.

Commissioner Michael Copps, who along with fellow Democratic Commissioner Jonathan Adelstein held hearings media concentration and advocated holding more, dismissed the initiatives as too little, too late.

"We now hear that there may localism issues after all. But what's going to happen while we study localism over the next year? The answer is: deals, deals and more deals."

NAB spokesman Dennis Wharton said, "NAB welcomes a review of the public service performed day in and day out by free, over-the-air broadcasters. As was demonstrated ... during the power crisis in the Northeast, there is no business in America more committed to keeping citizens informed than local radio and television stations."

MAP's LPFM Road Map

WASHINGTON The Media Access Project, which works with potential LPFM applicants, had suggestions for the FCC to get more LPFMs on the air, and noted that some applicants have waited three years for their paperwork to be processed.

Suggestions included reevaluating FM translator policies to eliminate noncommercial translators that do not originate locally broadcast programming.

"These satellite-fed translators chains are the antithesis of localism and are harming both noncommercial radio and low-power noncommercial radio," MAP stated.

The organization suggested that the FCC evaluate IBOC and adopt policies that will promote the carriage of LPFM stations to be transmitted among digital radio bit streams and alter EAS obligations so that they are easier for LPFM stations to meet.

"The less-expensive equipment that the FCC anticipated would appear has not materialized," it stated.

Harris Shuffles Sales Management

QUINCY, Ill. Harris Corp. is making changes in its broadcast sales structure, including naming a new director of radio sales. Its Broadcast Communications Division announced the reorganization of its North American sales team in August.

The sales group will be broken into teams for radio, television, international and enterprise solution sales.

"Sales representatives from Intraplex Products and Harris Automation will be moving into these new teams to better enhance each team's ability to offer solutions-driven product packages to the transmission and media acquisition markets," the company stated.

Roland Eid becomes director of radio sales responsible for managing continuing radio transmitter, systems and resales activities for the call-letter radio market. Eid was managing director of Harris Broadcast Europe, ITIS Products.

He replaces Virginia Lee Williams, who had been named to that post in 2001. She takes the new position of director of enterprise solution sales, responsible for managing sales to non-call letter customers.

Revenue in the Broadcast Communications segment has been on the decline. The company cited a drop in DTV equipment sales for most of that decline. In the spring, Harris eliminated approximately 230 positions, including about 105 in the broadcast division, and closed its Intraplex plant in Littleton, Mass

Digital News

▶ Continued from page 2

For the second quarter, Sirius reported revenue of $2.1 million, compared to $70,000 for the second quarter of 2002. The company saw its operating loss grow to $109.8 million, compared to a loss of $89.9 million for the quarter last year.

Sirius' EBITDA loss for the second quarter of 2003 was $86.3 million, compared with $67.8 million in the second quarter of 2002. The EBITDA loss included a $14.5 million non-cash charge associated with the disposal of Sirius' previous subscriber management system.

For the second quarter of 2003, average monthly revenue per subscriber was $7.91. Excluding the costs of mail-in rebates, the average was $10.84.

For the first half of 2003, Sirius reported total revenue of $3.7 million, compared to $103,000 for the first half of 2002. The satcaster saw a loss from operations of $208.9 million in that period, compared to a loss of $140.6 million for the first half of 2002.

Sirius subscriptions reached 105,186, a 55 percent rise, according to the satcaster.

GM: Half-Million XM Radios

TROY, Mich. General Motors has produced its 500,000th car featuring an XM factory-installed radio.

GM has spent 21 months installing XM in its vehicles over the 2002 to '04 model years. GM expects to have XM available in 40 models by September; the automaker expects to surpass 1 million factory installations by March 31, 2004.

Delphi 'XM Roady,' Smaller Antenna Coming

KOKOMO, Ind. Delphi expects to release the XM Roady this month. The unit has a list price of $120, which XM and Delphi claim is the lowest-cost satellite radio so far.

The Roady is designed to appeal to young people, 18-26-year-olds. The companies say it can be installed without professional help. The user can customize the receiver with seven backlit color displays and three interchangeable faceplates.

Roady includes "Tune Select," software that alerts the listener to favorite songs playing on any XM channel.

XM also plans to introduce a new, small antenna this fall. The XM Micro Antenna will be included with new XM products including the Roady in the third quarter.

— Leslie Stimson

Translators

▶ Continued from page 1

licensed to operate in the United States as of May, according to the FCC.

A seven-day window to apply for a translator frequency opened in March; it was the first opportunity to file applications since 1997 and became known as what one consulting engineer termed a spectrum "land grab."

In June the commission released a list of nearly 4,500 short-form uncontested applications that will not be subject to an auction. Experts believe the FCC potentially could double the number of authorized FM translator stations.

More than 13,000 short-form applications were filed to determine the number of uncontested vs. contested applications. Long-form applications, which the FCC will use to evaluate technical compliance with its rules, were due Aug. 29.

Encroaching translators

Although it's unclear exactly how many translators ultimately will be licensed, some station owners are concerned about short-form applications they say do not comply with interference standards. They also are displeased with a provision that they say allows proposed translator licensees to swap their primary station after their applications are granted and gives commercial applicants an advantage over noncommercial educational stations seeking a translator frequency.

Within a year, the FCC plans to release a list of uncontested applications accepted for filing. Then station owners and others would have a 15-day period to protest those selections through Petitions to Deny.

As with other commercial service auctions, which normally have a five-day petition-to-deny period, the FCC is authorized by Congress to hold open a short time period to address any issues with an application.

While they acknowledge that the comment period was put in by place to streamline the application process, some FM licensees say the period leaves stations little time to go through the final list of applications, evaluate potential interference problems and file objections.

"You can't (become prepared) until the long-form applications are accepted," said Rich Potyka, general manager and co-owner of KRXS(FM) outside of Phoenix.

FM stations also need to follow the progress of applications for translators filed in their areas, said Tom Taggart, co-owner of two stations in St. Mary's and New Martinsville, W.Va., WRRR(FM) and WNMR(FM).

Station owners will have to pay the expenses of defending their stations and overcome the challenges of using the FCC database to evaluate potential problem translators, he said. Both owners worry about what they say is the inaccuracy of the information in the database that may allow encroaching translators to get on the air.

An auction filing window, never before conducted for FM translators, could produce more authorizations than the commission has allowed in more than 20 years.

An FCC Audio Division official disputed this, saying the agency has never granted an authorization in error because of a database omission in the Consolidated Database System. The CDBS is used as a source of engineering data for many studies undertaken by stations.

The official said the division also regularly grants channel changes to translators to lessen potential interference on FM stations.

Translators must meet the requirements of Section 74.1203 rules, which state that if a translator causes interference to another FM full-service station and the FCC receives complaints from legitimate listeners independent of the complaining station, the translator would be required to cease operation or reduce power to eliminate the interference.

In the event an application were granted accidentally, petitioners could file a petition for reconsideration within 30 days of the granting of the license, the FCC official said.

In recent history, the FCC has had one case in which it had to reverse a decision. The case involved an application for a new AM station in 2001. The commission granted an application to Star Development Group Inc., which used information from the CDBS in its application for 1120 kHz in Orlovista, Fla.

WRMQ(AM) in Orlando filed a motion against Star's application for interfering with the station's prior application for a minor change to increase its daytime power to 5 kW.

According to the FCC public announcement in July 2002, the station's application was filed on a paper form at a time when the commission was converting paper records to electronic forms. Because of an error, the application was not entered into the CDBS. The following year, the commission recognized the error and allowed Star Development Group to file another application.

The action on the situation serves as an example of the FCC's legal recourse to correct errors after an application is approved, said Alan Rosner, consulting engineer at Maryland-based Denny & Associates, vice president of the Association of Federal Communications Consulting Engineers and head of an ad-hoc AFCCE-FCC committee to fix CDBS errors.

Commission rules do allow translators to operate on second- and third-adjacent channels located within a certain distance of licensed operators. These rarely cause problems with modern receivers, according to broadcast consulting engineer Gray Frierson Harding.

According to Section 74.1204(d) of the FCC rules, translators can operate in an area even if there is predicted interference to full-power stations if demonstrated that interference will not occur due to lack of population within the overlap area.

Any interference heard at the edge of the predicted contour of existing stations, Harding said, is limited to small areas such as a one- to two-block radius, depending on the relative strength of the signal.

"I think that worries about second- and third-adjacent channel interference are overblown; but some of that remains to be seen," he said. "If the translator causes interference, being classified as a secondary service, it has to correct the interference or go off the air."

No numbers

Some consulting engineers contacted by Radio World were unclear about how many full-power stations might be affected by the possible influx of translators in the future.

AFCCE President Charles Cooper, consulting engineer at duTreil, Lundin and Rackley, recently conducted a study to find out how many translators would have to seek waivers to broadcast in or adjacent to the service contours of full-service FM stations.

Using standard FCC propagation curves of translator applications, Cooper found that 1,842 among the 4,500 uncontested applicants would cause interference for two understandable reasons: the proposed translators may function as "fill-ins" for stations already broadcasting in that area, or the applications may have contained typos for the coordinates of the proposed translators.

Though the interference question is something FM broadcasters should monitor, Cooper said, he doesn't believe stations should worry about the proposed translators

See TRANSLATORS, page 8 ▶

◆ NEWSWATCH ◆

Station Application 'Freeze' Is Over

WASHINGTON A freeze on the filing of new applications for station transactions and construction permits is over, now that the FCC has new forms ready.

The commission had to revise Forms 301, 314 and 315 after it passed new ownership rules in June; it also needed to obtain approval of the forms from the Office of Management and Budget.

The forms are available from the Media Bureau's Consolidated Database System: *www.fcc.gov/mb/elecfile.html.* Electronic filing is mandatory for these forms. Previous editions may not be used.

Parties may amend pending applications electronically to demonstrate compliance with the new rules using the revised forms.

Broadcast Sessions Are Part of AES

NEW YORK Kahn? Dorrough? Foti? Caesar? Those are familiar names in audio processing for broadcast. Those four and others will take part in a session at the AES convention in New York.

"Audio Processing for Broadcast" takes place Saturday Oct. 11 with Marvin Caesar of Aphex, Rocky Graham of Dolby, Mike Dorrough of Dorrough Electronics, Leonard Kahn of Kahn Communications, Robert Reams of Neural Audio, Frank Foti of Telos/Omnia, Thomas Lund of TC Electronics and David Reaves of Translantech.

Other broadcast sessions include the "Rebuilding of New York Broadcasting" on Friday, Oct. 10 and "Digital Broadcasting in the U.S." on Sunday, Oct. 12

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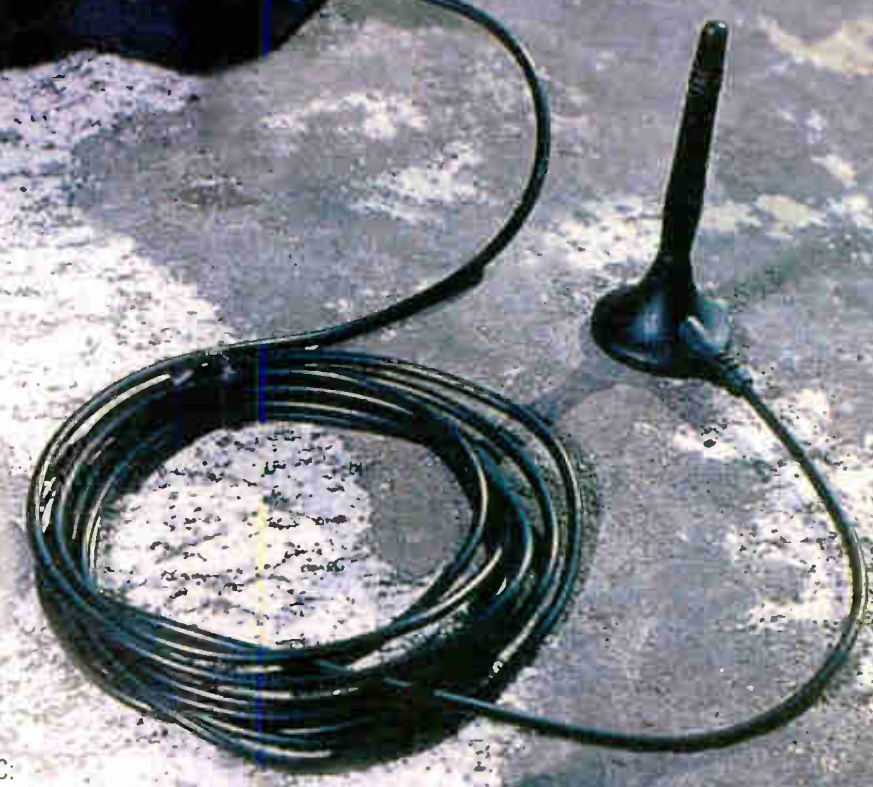

Here is what some of our numerous Beta Testers had to say:

Clear Channel Director of Engineering for St. Louis Daryl McQuinn said: **"Sounds much better than a bad [RPU], almost as good as a good [RPU], and way better than you should ever expect from a cell phone remote!"** but all KLOU's Program Director Al Brock could say was, **"Wow!"**

Shaun Kassity from Salem Communications' 104.7 The Fish in Atlanta: **"Thanks to Matrix GSM we had the best sounding remotes ever on our station!"**

Steve Kirsch of Silver Lake Audio: **"The feed was rock solid. I'm very impressed—it sounds much better than I thought it would."**

Collin Mutambo, Radio Simba, Kampala, Uganda: **"We are indeed quite impressed."**

But our personal favorite, from Jerry Dowd of Jefferson Pilot's WBT in Charlotte, NC: **"We hope to keep the betas until you get nasty with threatening letters."** Thanks Jerry. We'll take that as a compliment!

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Translators

▶ Continued from page 8

at present because some applicants will not follow through with long-form applications.

He said those who do will need to fix any errors made on their short-form application when filing the long form, eliminating any cause for concern.

Some other radio professionals are concerned that the FCC's filing procedure may worsen the problem.

In the short-form applications, many applicants applied for every available frequency in their communities; others applied for several translators in the same location to maximize their chances.

But the FCC's short-form list did not suggest that the agency evaluated their applications to see whether the frequencies are available and conform with protection requirements, said Roy Stype, head of the engineering department at Carl E. Smith Consulting Engineers.

"The FCC sees (the process) as more efficient because they don't spend time on applications," Stype said, adding that the FCC only looks at the applications to determine which ones are uncontested.

But according to auction rules (MM Docket 95-31) adopted by the commission, the FCC is supposed to use the short-form application to determine if applicants are uncontested. The Audio Division will evaluate the long-form applications for technical compliance.

The FCC is confident that it can weed out problematic applications using the long-form application process. Though hundreds of FM translators exist on second- and third-adjacent channels within the service contour of full-service stations, the division official said the FCC has received no interference complaints.

Commercial advantage

The application process also is raising a fear among some noncommercial translator contenders. They believe fellow applicants are trying to circumvent the proposed rules for how the FCC should handle groups of uncontested applications that contain both non-commercial and commercial applicants.

The proposed rules reflect a district court ruling that prohibits the commission from forcing public broadcasters into auctions.

Within the next year, the FCC plans to release a list of uncontested applications accepted for filing.

Uncontested applications would be given an opportunity for settlement under the current rules, which have to be finalized and are a part of an ongoing rulemaking by the FCC. Under current rules, if no settlement can be reached between the applicants, the noncommercial applications would be dismissed in favor of commercial applicants, said Harding. Once a station is on the air, it can file a minor modification application to change its primary station to another commercial or public station later.

The FCC official said the current rules give commercial applicants a slight advantage, but no guarantee that they will win the frequency at auction if more than one commercial applicant is competing against one another.

Religious broadcasters

Several engineers also are concerned that the top two applicants in the short-form window may be trying to circumvent the proposed rules.

According to FCC applicant records, Radio Assist Ministry and Edgewater Broadcasting approximately filed a combined 4,000 short-form applications. The FCC approved 157 of Radio Assist Ministry's applications and 97 from Edgewater Broadcasting.

Harding is concerned they may agree to translate commercial stations and, after their applications are granted, begin translating their own religious broadcasting.

"It's mostly just a land grab," Harding said. "You apply for it all ... see whether you're MXed ... and then select what you want." MXed refers to mutually exclusive applications.

Moreover, Harding said, "The government is richer by $600 each." Applicants who apply for a translator indicating that they will relay primary commercial stations have to pay an application fee of $600. Noncommercial applicants are exempt from the fee.

A representative of Radio Assist Ministry said he understands the concerns of some broadcasters about interference and Radio Assist Ministry will work to evaluate and fix potential problems at the time of its buildout.

"The FCC has regulations that address these concerns. These other groups have nothing to fear," said Clark Parrish, who filed applications for the group. "Although many construction permits will be granted, only those stations that are turned on and do not interfere with existing facilities will remain on air."

Parrish said the nonprofit group plans to file as many as long-form applications as possible.

"Some of the applications are not workable and we do not intend to file long-form applications for those," said Clark Parrish, who filed applications for the group. "We plan to use many of the multiple 'singletons' that are granted to resolve the mutually exclusive filings which will benefit other organizations."

Parrish said Radio Assist Ministry and Edgewater Broadcasting, which are nonprofit educational organizations, are governed by similar boards of directors. Radio Assist Ministry, he said, has the necessary financial commitment to not only file the applications to rebroadcast both non-commercial educational and commercial stations but also to build and operate the stations.

While the group does plan to rebroadcast primarily Christian educational programming stations and other religious programming and Spanish programming formats, Parrish said Radio Assist Ministry plans to help other organizations seeking to get into broadcasting and assist existing broadcasters to expand, reaching more than 1,000 communities.

AFCCE, FCC Iron Out CDBS Issues

In the last few years, the FCC has made great strides to clean up the Consolidated Database System, according to an organization representing engineering consultants.

Alan Rosner, consulting engineer at Maryland-based Denny & Associates and vice president of the Association of Federal Communications Consulting Engineers, the commission has been responsive in fixing mistakes when pointed out by the committee.

Rosner, head of an AFCCE-FCC committee to fix database errors, and fellow committee members meet with the Audio Division staff every other month to discuss issues and run regular checks on the database to find errors. They report those mistakes to the agency.

"They tell us the reason (for the error) and fix what's wrong," Rosner said.

Rosner cited three reasons for inaccuracies in the database: human processing errors by the applicants such as typos, mistakes in old data in which the cleanup is still ongoing and internal processing errors at the agency. Sometimes, Rosner said, this type of inaccuracy will get into the session when the commission grants a new application but the old application is not deleted.

In the past, the FCC has maintained that the databases are unofficial listings prepared for the convenience of the commission and should not be relied upon by the public because of cases in which the database may not match up with official sources of information, including official license documents or actual applications.

That view is being challenged by AFCEE. In May 2002, it requested that the FCC designate CDBS as the official source of broadcast station technical parameters because of the number of FCC applications that must be filed electronically.

"While we recognize that the CDBS, like previous official sources, may sometimes have errors, we believe it is important for the commission to codify use of the CDBS as the new official source so that filings may be based on it without questions of negligence being raised over use of the CDBS," AFCEE wrote in its filing last year.

At press time, Rosner said AFCCE hoped for a response from the FCC's Media Bureau before this fall.

Because CDBS is updated almost constantly, Rosner said it is difficult to quantify the rate at which errors enter the database. If stations are concerned that proposed translators will cause interference to them, Rosner offered this advice: Every station should be diligent in knowing what is contained in its record and contact the FCC to correct mistakes themselves.

— Naina N. Chernoff

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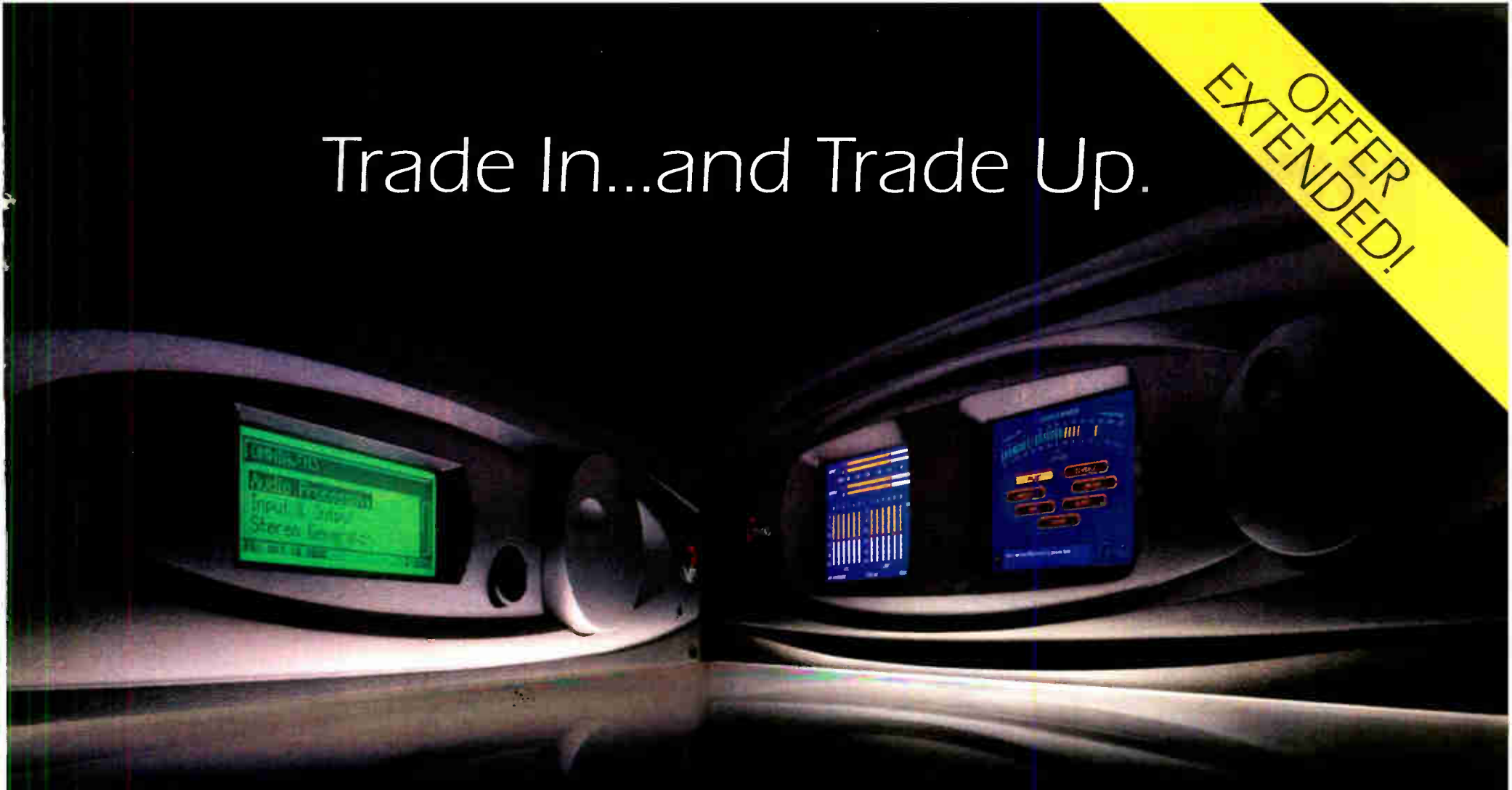

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HD Radio News

Radio World — Covering the Industry's Digital Transition — September 10, 2003

OK for Dual Antennas Sought
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NEWS ANALYSIS

Will New Codec Do the Trick?

by Leslie Stimson

The summer of 2003 was not the quite the summer of love Ibiquity Digital had been expecting.

At the NAB show this spring, company officials said they hoped to help stations using its HD Radio system promote their digital sound in towns across America — think HD Radio Beach promotions.

Instead, the momentum behind IBOC practically ground to a halt when the standards-setting body, the National Radio Systems Committee, stopped its vetting process for HD Radio. The leaders found the audio quality produced by Ibiquity's PAC codec not good enough for broadcast on AM at low bit rates.

In May, the NRSC stopped standards setting for the technology for both AM and FM.

What a difference a few months can make.

Now Ibiquity has a new codec called HDC. The leaders of the NRSC and its DAB subcommittee have heard it and say they're impressed. They have agreed to resume the standards-setting process, which the FCC eventually will use to develop final authorization rules for IBOC digital radio.

Some U.S. radio stations continued to convert to HD Radio during the pause.

'Resolved'

"Nobody is happier than I am to see the codec issue resolved," said DAB Subcommittee Chairman Milford Smith. He said recent private demos of Ibiquity's system incorporating the new codec were well-received by steering committee members.

Ibiquity and other IBOC proponents hope to regain momentum lost during the "pause" toward commercializing HD Radio.

Skeptics say Ibiquity isn't out of the woods yet; they feel the technology developer lost some credibility with the industry because it took so long for the company to focus on the codec issue and because it dismissed roughly 30 employees, including several of its top engineers.

Photo by Leslie Stimson

Bob Struble at the spring NAB. The company hopes to regain its momentum with a new codec in place.

Critics also note that Ibiquity has not released technical details of its new codec; and as yet there is no public data to back up the claims of improved performance of HDC over AAC on AM.

The layoffs were reportedly made for cash-cutting reasons. The Columbia, Md., company has declined to discuss personnel issues publicly.

Ibiquity must stretch its cash for long enough to launch the product, sources say. One broadcast engineer said the company may require about two years of income from fees on receiver sales before it will realize substantial revenue from the technology.

Ibiquity President/CEO Robert Struble said reports of the company needing more cash are incorrect.

"Our cash position is solid," he said, adding that the company has enough money to take it well beyond the first quarter of next year.

Yet several broadcasters told Radio World privately that Ibiquity is seeking more radio groups as investors. The recent codec demos are key to that plan, said sources.

Ibiquity has conducted private demos for engineers of several large groups and some station managers. It declined to provide a list, but demos reportedly included, Clear Channel, NPR, Susquehanna, Journal Broadcast and other major radio organizations.

One source with a group that has not yet invested in Ibiquity said, "It was like, 'Show me the codec.'"

Certainly the codec issue cost Ibiquity in terms of time to market. New codec software is expected to ship to its chip partners by mid-September.

Stations first

Kenwood hopes to be first to market with manufactured HD Radios. Earlier this year it had expected to ship receivers to retailers in the summer. After the news of the new codec, the company said it expected to ship HD Radios to stations that are on-air with Ibiquity's technology this month and in limited quantities to certain retailers in the fourth quarter. The Kenwood radios were not yet assembled as of mid-August.

Ibiquity was to deliver codec software upgrades to chip partners S.T. Microelectronics, Texas Instruments and Philips, so the chipmakers could upgrade the software on their chips and make them available to receiver manufacturers for HD Radios.

Kenwood plans to make a big splash at the CES show in January with its 2004 HD Radios and to be able to ship significant quantities of product that month. Kenwood also plans to introduce a home version in the first quarter of 2004.

Vice President of Kenwood USA Bob Law said the codec change has required only software changes in receivers, not modifications in hardware. This means the "pause" and its aftermath will be invisible to consumers.

Yamaha postponed earlier plans to release home receivers for HD Radio in 2003 due to the pause.

Visteon plans to include HD Radios in a European automaker's products in model year 2005 are on track. Those autos would come out in the last half of 2004 to the first quarter of 2005, said a spokeswoman.

See CODEC, page 11 ▶

Codec

▶ Continued from page 10

Bill Wikehart, a DSP specialist with Visteon, said many automakers are interested in HD Radio.

Delphi reportedly delayed plans to ship HD Radios in 2003 for some model year 2004 cars. Attempts to reach Delphi for comment were unsuccessful.

HDC jointly developed

The HDC codec is unique and proprietary to Ibiquity, according to President and Chief Executive Officer Robert Struble. He and some industry sources say the codec is not aacPlus, nor is it PAC. Others believe it could be a custom version of aacPlus.

Ibiquity Chief Operating Officer Jeff Jury said HDC makes use of AT&T Bell Labs core patents. Ibiquity now holds the rights to the patents related to this codec, the result of the earlier marriage of USADR to Lucent Digital Radio.

HDC has been customized for AM and FM broadcasters and to work with the Ibiquity system.

Coding Technologies Vice President and U.S. General Manager David Frerichs said the Spectral Band Replication technology used in the codec helps Ibiquity "hit the bit rate efficiencies they were looking for." He said the new codec has a bit rate resiliency that makes it suited for AM and FM broadcasting.

Coding Technologies says its Spectral Band Replication technology is part of the Digital Radio Mondiale open standard and a core object type of MPEG-4 Audio.

Some questions remain about the performance of the new codec. Engineers who have heard it were careful to note that on AM, artifacts are not eliminated fully. They have however been substantially reduced — so much so that, they say, the system is acceptable for broadcast.

As yet there is no public data to back up claims of improved performance of HDC over AAC on AM.

Ibiquity plans to re-do some of its tests with the new codec and submit the results to the NRSC.

The NRSC reviewed Ibiquity test results using the previous codec, AAC, with both FM and AM. Ibiquity intended to redo certain tests when it switched to PAC. It submitted, then withdrew those results earlier this year, intending to try again with a newer version of PAC. Then the NRSC announced its standards pause.

The new codec will be used for both AM and FM, Ibiquity said, although the NRSC had no complaint with PAC used on FM.

And where does this leave PAC, Ibiquity's former codec? Ibiquity intends to support PAC because it still has a customer for the codec, Sirius. A spokesman for the satellite company said Sirius intends to keep using PAC.

Although much of the PAC team in Warren, N.J., is no longer with Ibiquity, roughly five employees who work with PAC remain, said sources.

Harris Is Shipping DAX 5/6

CINCINNATI Harris has begun shipping its DAX 5/6 kW AM Radio transmitter. The models are lower-power transmitters marketed to stations that plan to make a conversion to digital radio.

"The DAX AM 5/6 kW creates the most accurate reproduction of the high-definition signal for low power ranges," the company stated. "A station can use the DAX to transmit its current analog signal and transition easily to digital by adding a Harris Dexstar digital radio exciter."

Features include hot-swappable PA modules and Digital Adaptive Modulation, which the company says can reduce antenna load-induced distortion, resulting in a cleaner analog signal, and extended coverage in digital modes, such as IBOC and DRM.

BE to Throw HD Radio Seminar in Philly

QUINCY, Ill. Broadcast Electronics will host an HD Radio seminar in Philadelphia on Wednesday, Oct. 1, the first day of the NAB Radio Show. The company said it has conducted approximately 30 seminars during the past two years.

The seminar will cover digital radio implementation, installation and planning criteria as well as field reports. It will be conducted by BE's engineering and marketing departments.

The seminar will be held at the Downtown Courtyard by Marriott Hotel from 1:30 to 3:30 p.m. There is no charge; reservations are required. To register, send e-mail to HDR@bdcast.com.

Dual Antenna Tests Complete

by Leslie Stimson

The NAB is hopeful that the FCC will allow stations to use dual rather than single antennas to implement IBOC.

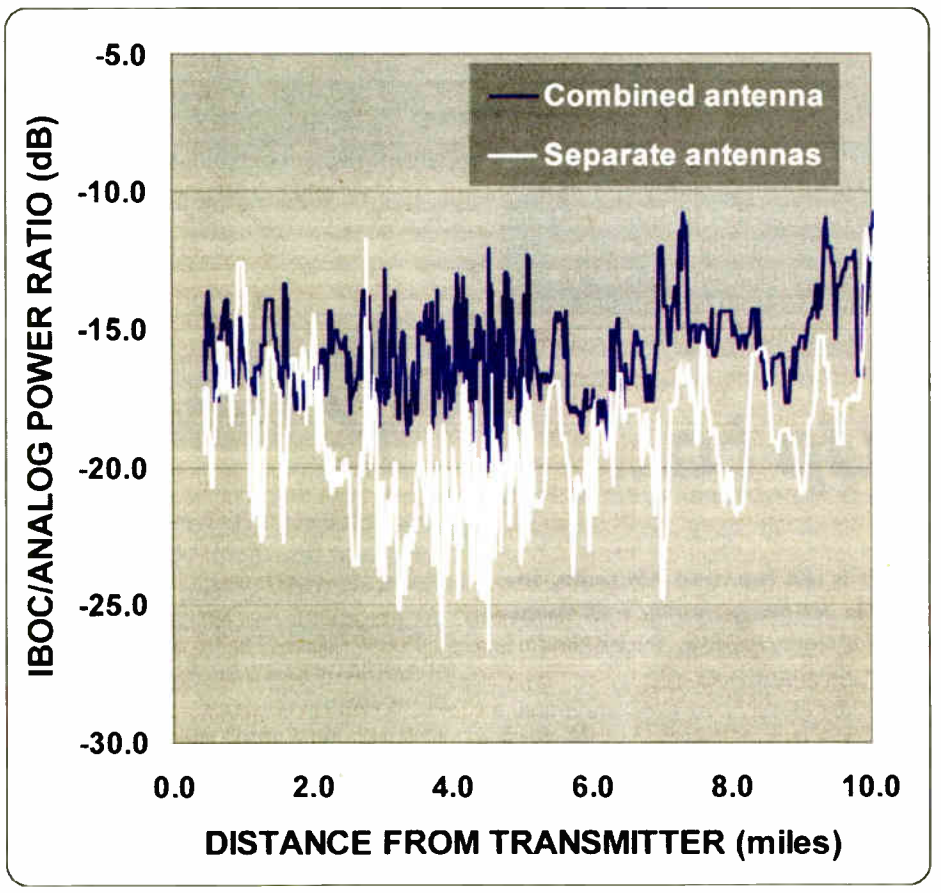
The association has submitted a report to the commission on the results of experiments with FM stations using dual antennas, i.e. one antenna for IBOC and another for analog. An ad hoc antenna group organized by the trade group believes the so-called "dual antenna" approach has an advantage over high-level or low-level combining. Those approaches each use one common antenna to broadcast the combined analog/digital signals.

"The use of separate antennas results in smaller transmitters, lower cost of equipment acquisition and operation, and reduced floor space requirements in the transmitter room," the NAB stated in its report.

In its interim authorization for IBOC, the commission did not allow stations to use separate antennas because it had no test data on such applications. The NAB technical group believes that, if approved, the concept would help stations get on the air more quickly with HD Radio.

A separate antenna implementation involves broadcast of the analog and digital signals from independent antennas located at different locations, presenting different coverage and compatibility issues than a combined antenna approach.

The group wanted to learn two things from the tests: Would separate antennas provide digital coverage comparable to that available with a single antenna? And would the digital signal generate increased interference into the host analog signal?



The two curves illustrate the measured field strengths of the analog and digital signals, expressed as a ratio, for both the combined (dark line) and separate (white line) antenna cases, vs. distance from the transmitter.

The group tested the concept at FM stations WMGC in Detroit, WDHA in Dover, N.J. and KDFC in San Francisco. These stations provided a variety of horizontal and vertical separations with the potential to affect both digital coverage and host compatibility.

The first round of tests used a combined IBOC/analog operation using the main antenna. The second mode permitted IBOC operations using the auxiliary antenna while analog broadcasts used the main antenna. Denny & Associates took measurements using combined and separate antennas for direct comparison.

The stations presented different conditions for testing. WDHA is a lower-powered Class A license in an area of varying terrain. The WDHA IBOC digital effective radiated power level was 9.8 watts, the lowest ERP of all the test stations. WDHA uses two similar rototiller antennas for its main and auxiliary operations.

The NAB technical group believes that the concept would help stations get on the air more quickly with HD Radio.

In contrast, WMGC is a Class B located on a tall tower in an area of relatively flat terrain, providing what Denny & Associates termed "close to ideal" propagation conditions. The station has a two-bay cogwheel-style panel as its main antenna and a two-bay side-mounted rototiller for its auxiliary.

KDFC is a Class B in San Francisco, which has mountainous and flat terrain. The auxiliary antenna is not on the same tower as the main, but on a nearby shorter tower on a ridge.

According to NAB, the test results confirmed the viability of the second antenna approach and the feasibility of a blanket authorization for stations to implement IBOC in this manner.

In the majority of cases, the coverage from the separate antenna approach approximated the coverage from the combined antenna approach.

"In the majority of cases, the coverage from the separate antenna approach approximated the coverage from the combined antenna approach. Moreover, the impact to the analog signal tracked closely for both the combined and separate antenna implementations," NAB states.

The association did say there may be some cases in which the separate antennas create "some limitation on potential digital coverage." However it believes lower equipment costs make up for it.

NAB has asked the FCC to allow stations broadcasting with HD Radio to use separate antennas if they meet certain criteria: The digital transmission must use a licensed auxiliary antenna; the auxiliary antenna must be located within 3 seconds of latitude and longitude of the main antenna; and the vertical separation of the antennas must be limited so that the auxiliary antenna is between 70 and 100 percent of the height above average terrain of the main analog antenna.

The ad hoc antenna group has 25 members including representatives from Harris, Shively Labs, ERI, Dielectric, Ibiquity Digital, Susquehanna Radio, NPR, Clear Channel Radio, Entercom, Greater-Media, Cox Radio, Bonneville, Jefferson-Pilot, Denny & Associates and the FCC.

An NAB spokesman said the group was hopeful the commission would approve the concept. To see the report, visit *www.nab.org/scitech.*

What's better than MP3? Broadcasters agree: it's AAC.

Being a technology leader is something we take pretty seriously. When new tech is introduced by a Telos product, you can be confident it's the absolute best – so you shouldn't be surprised to find high-performance MPEG AAC coding in the latest Zephyr products.

Remember the original Zephyr? Its introduction of MP3 coding turned broadcasting upside down, and since then MP3 has become extremely popular for audio distribution, especially on the Internet.

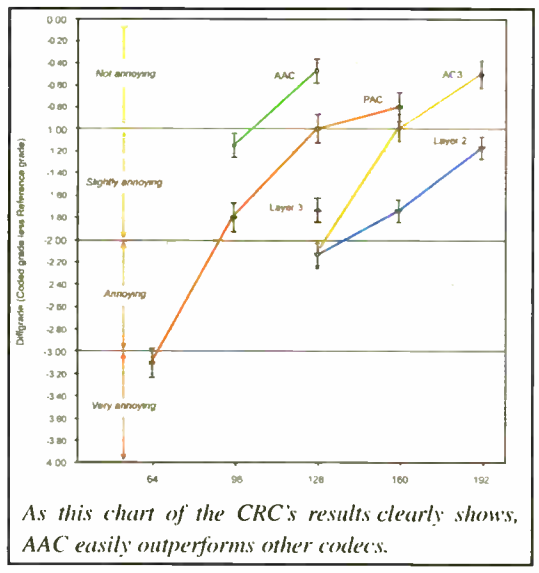
But MP3's compression technology is now over a decade old, and there have been a lot of advances in perceptual audio coding and compression since then. You wouldn't settle for a '386 computer these days – so why be content with compression technology from the same era? What you want is Advanced Audio Coding... MPEG AAC.

MPEG AAC takes advantage of all of the latest advances in compression technology. Compared to MP3, AAC delivers higher quality audio at much lower bit rates, resulting in noticeably better audio even over low-data-rate connections. AAC also cascades better than older codecs – especially important for HD Radio considerations.

Move Over, MP3

AAC was developed by the Fraunhofer Institute for Integrated Circuits (FhG IIS, the inventors of MP3) and a consortium which included Sony, Dolby Labs, Nokia and AT&T. Their goal: to create a codec that would satisfy the International Telecommunications Union's Recommendation BS.1115, which specified indistinguishable source-to-output quality at 64 kbps per mono channel. They succeeded with AAC, which is a coding algorithm *30% more powerful* than MP3.

AAC is, by scientific and subjective analysis, the best-sounding, most efficient pure perceptual codec yet, and has been part of the International MPEG-4 standard (ISO/IEC 14496) since 1999. As a point of reference, the near-CD quality Layer 2 codec needs a data rate of 192 kbps per channel to deliver high-quality stereo; AAC gives the same quality at just 64 kbps!



As this chart of the CRC's results clearly shows, AAC easily outperforms other codecs.

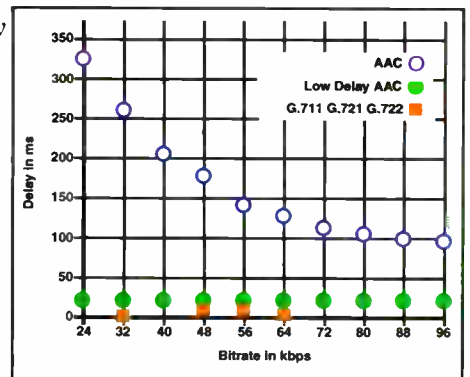
"The AAC codec outperforms the rest of the codecs," stated Canada's Communications Research Centre after performing double-blind subjective tests of 17 codecs (including MP3 and Layer 2) to determine which was best.

"When compared side-by-side, AAC proves itself worthy of replacing MP3 as the new Internet audio standard," says Apple Computer, which has incorporated AAC into its latest software products.

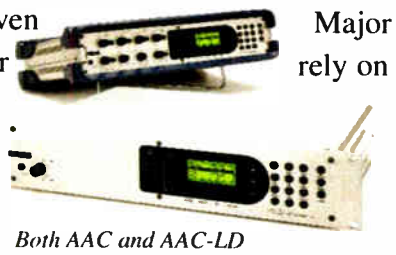
Better Audio, Less Delay

In addition to "plain" AAC, broadcasters have another tool specifically designed to improve the performance of remote audio transmissions: AAC Low Delay (known as AAC-LD for short).

AAC-LD *slashes encoding delay by nearly 70%* compared to MP3 – invaluable for real-time two way broadcasts. It also employs new techniques to offer both low delay and high fidelity. Compared to speech coders (such as G.722), AAC-LD handles both speech and music with good quality. Unlike speech coders, however, audio quality scales up with bit rate. With AAC-LD, audio quality is far superior to G.711 or G.722 at the same bit rate, and equal or better to MP3 at the same bit rate.



Comparative delay of AAC, AAC-LD and G.711/G.721/G.722 at different bit rates. AAC-LD delay delivers nearly immediate encoding with fidelity superior to MP3.


Both AAC and AAC-LD are featured in the Telos Zephyr Xstream rack and portable codecs.

Major personalities such as Rick Dees have come to rely on AAC-LD for better-sounding remotes. Jerry Burnham, KIIS-FM Special Projects Engineer, told us "AAC-LD coding in Zephyr stream is amazing. Low-Delay coding is a tremendous advantage. We get fantastic-sounding remotes, and we can interact with phone callers, traffic reporters and other remote sources without that annoying time lag."

"The Best Low-Bit rate Codec on Earth"

There's one more exciting part of the AAC story: *aacPlus*™. This extension of AAC melds Spectral Band Replication with MPEG AAC, resulting in truly stunning audio fidelity at bit rates never thought possible before. In tests conducted by the European Broadcasting Union (EBU) which compared a variety of codecs at several bit rates, they declared *aacPlus* as the clear winner, significantly outperforming proprietary competitors and improving over other standards; studies conducted by DRM and MPEG confirmed that *aacPlus* is ideally suited for the low bit rates of AM & FM IBOC. *aacPlus* has been chosen for use by XM Satellite Radio and Digital Radio Mondiale, and will soon be in 2.4G and 3G audio applications deployed by Matsushita and NEC.


Zephyr Xport is the only POTS codec with aacPlus. It can send 15 kHz mono audio over analog lines.

Industry experts agree. "AAC Plus is the future... all else is stone knives and bearskins," according to Gary Blau of Jefferson-Pilot Communications. Jeff Johnson of X-Star Radio Network agrees: "It is quite amazing how decent a 32 kbps bitstream can sound."

Telos has chosen *aacPlus* as the algorithm used in the new Zephyr Xport POTS + ISDN codec. Paired with custom modem technology developed by Telos, *aacPlus* enables Xport to send 15 kHz mono audio over ordinary POTS phone lines.

Of course we hope you will purchase Telos equipment. But even if you decide differently, make certain that whatever codec you do purchase – POTS, ISDN, serial or otherwise – takes full advantage of today's advanced audio coding technology. Make certain it has AAC.

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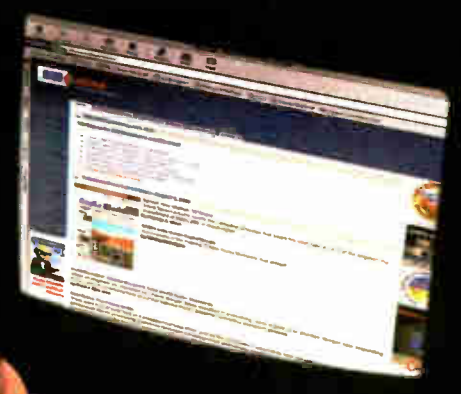

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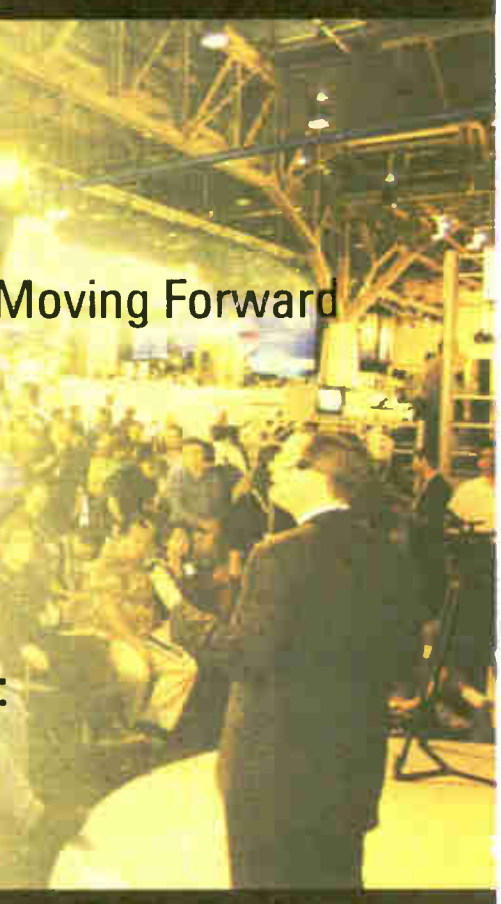

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GUEST COMMENTARY

'Open' Source? Up for Interpretation

by Paul Signorelli

The author is chief technology officer of Impulse Radio.

Having read the July 16 *Guest Commentary* "HD Radio Data Poised to Explode" by Ibiquity Digital's Joseph D'Angelo, I was a bit concerned (though not surprised) by the announced direction Ibiquity is taking with data "standards" and by the highly subjective information presented in the article.

The commentary offers a high-level overview of Ibiquity's solution for HD Radio data services and touts a "royalty-free approach that uses open source intellectual property."

As a member of the Working Group of the IBOC DAB Subcommittee for the creation of IBOC standards, a member of the Digital Data Broadcasting Subcommittee (both established by the NRSC) and the chief technology officer of Impulse Radio, a company that has championed and pioneered truly open data standards for the broadcast industry, I'd like to fill in the blanks for Radio World readers.

The proposed "solution" of which Mr. D'Angelo writes is neither open nor complete. And it certainly won't be free.

Risks

The recent codec debacle, the suspension of the NRSC standards process, the derailing of the work of the Digital Data Broadcasting Subcommittee before it ever got started and the resulting uncertain timetable for digital receivers reaching the market provide a stark lesson about the risks of relying on a single provider to dictate every solution and put forth all the technology.

This situation demonstrates the necessity of truly open, industry-led and -supported standards processes and should remind us why other industries that build communication networks conduct such processes.

To Ibiquity's credit, a portion of its attempt at a data services solution is at least in part based upon a standardized protocol called SMIL. That portion is the markup language is dubbed HD BML.

By way of background, SMIL was developed as a markup language for supplying multimedia content with streaming audio on the Internet and for synchronizing the presentation of the content with the audio. HD BML could work for some of the applications being considered for HD Radio, in particular program-associated data applications that involve rich multimedia data.

Mr. D'Angelo and Ibiquity praise SMIL because of the royalty-free, open-source nature of the solution; however, that claim needs some clarification.

The SMIL specification is open to all and distributed by the World Wide Web Consortium, a public organization that develops specifications and technologies for the Web and oversees many existing Web standards such as HTML, XML and SMIL on a royalty-free basis. Developers have written SMIL interpreters for which they freely distribute the source code, provided implementers share all improvements with them. Thus, we fittingly arrive at the term "open source."

However, Ibiquity is not proposing a straight-up version of SMIL in which one could download the source code and directly place it on a receiver. This markup language, SMIL, must be modified to work with HD Radios where the communication is entirely one-way.

This modified version, HD BML, will be owned and controlled, updated and tweaked by one company: Ibiquity. "Based on open" is not "open," no matter how many times Ibiquity says it.

> **'Based on open' is not 'open,' no matter how many times Ibiquity says it.**

Top of the stack

More important, a complete data service protocol requires far more than a markup language like SMIL or HD BML to function. The markup language is the outermost layer of the onion, the top of the so-called "stack."

Consider the Internet, for example. SMIL or HTML rides on top of some other pretty important protocols in the process, namely HTTP, TCP/IP and Ethernet. These protocols work to ensure the complete and timely delivery of the data.

What good is the ability to synchronize images with audio if the images can't arrive at the same time the audio arrives? What good is a markup language to handle presentation if you can't access and manage the pipe that is delivering the data?

Think you could create a Web page or e-commerce site only using HTML? You need a lot more than a markup language. You need a series of protocols working together in complementary fashion to ensure the timely, secure and accurate delivery of the data.

Where are the rest of these indispensable protocols? They will exist, no doubt, as part of the Ibiquity proprietary solution that lies below the "Services and Data Client APIs" that Mr. D'Angelo describes in his commentary.

Consequently the industry will end up with a data solution from Ibiquity that consists of a top layer that Ibiquity is happy to call "open" when it's really not, and a proprietary solution for the rest.

Ibiquity uses words like "open-source" and "royalty-free" hoping it will suffice in place of a true open standards process. If the industry acquiesces, in all likelihood HD BML and the entire data solution will suffer the same fate as another great Ibiquity invention, PAC.

Mr. D'Angelo claims that Ibiquity "will continue to refine the standard based on the feedback we receive before the formal endorsement and final release.... (and) we expect to continually work with the industry to upgrade the standard as needed."

As Radio World reported earlier, the Digital Data Broadcasting Subcommittee, or DDB, was formed by the NRSC in January to establish a set of open protocols for HD Radio data services and standardize them.

The industry desperately needs this process for data services. Because Ibiquity has decided to ignore this process by announcing its own solution and refusing to bring it forward through the DDB — a committee Ibiquity seemingly is on public record as being against choosing to ignore — I think we need to answer the question: Is HD BML just more of the same rhetoric from Ibiquity?

Is it really something open and for the industry? Or is it an Ibiquity-controlled solution where they choose who implements it, when it gets implemented, how it gets implemented and what you readers will pay for it?

Keep in mind, broadcasters, that you will not be able to put any data on *your* spectrum without paying Ibiquity — no matter how many times you download the HD BML specification.

Therein lies the biggest problem with the Ibiquity approach. It is not the technical merits of the solution. It is the fact that the solution has completely circumvented the DDB, a group specifically created by the industry, via the NRSC to establish a set of protocols for HD Radio data services, and the one organization embracing an approach that history shows has the ability to create real value for new technology.I'm tripping up on where the phrase "via the NRSC" should go. I suspect but wish to confirm that the above graph should read: Therein lies the biggest problem with the Ibiquity approach. It is not the technical merits of the solution. It is the fact that the solution has, via the NRSC, completely circumvented the DDB, a group specifically created by the industry and the one organization embracing an approach that history shows has the ability to create real value for new technology.

Ibiquity is running from an open standards processes that history has proven will ignite innovation, create competition and generate exponential growth in the industries that use them such a process. Consider digital television and the wired and unwired Internet as recent examples of the value of such a process.

Ironically, it seems Ibiquity would prefer to own all of nothing rather than a large piece of something huge. So let's not simply let them assuage us with talk of openness. We're dumb, but not that dumb.

Radio World welcomes other points of view.

'Tomorrow Radio' Tests Are Underway

by Leslie Stimson

SAN FRANCISCO National Public Radio, Harris and Kenwood USA are closer to finding out whether splitting a station's digital audio signal into two channels will be practical.

Field testing began in August for the so-called "Tomorrow Radio" project on four FM stations: KALW in San Francisco, KKJZ in Long Beach, Calif., WETA in Washington and WNYC in New York.

The tests are notable for two reasons, representatives of the sponsor companies believe. They are the first station tests using Ibiquity Digital's system conducted by non-Ibiquity employees or contractors. Also, they're the first station tests using only commercial, off-the-shelf HD Radio transmission equipment.

Photos by NPR's Jan Andrews

Tomorrow Radio test van near the Golden Gate Bridge in San Francisco.

Varied terrain

The tests were expected to end Sept. 12, after which Stan Salek of the consulting engineering firm Hammett & Edison is slated to evaluate the results and report on the findings. Mike Starling, NPR vice president of engineering and operations, hoped to submit the report to the DAB Subcommittee of the National Radio Systems Committee at its Oct. 1 meeting at the NAB Radio Show in Philadelphia.

Originally, the group had one station, KKJZ, lined up for the tests. Members decided to include more to see how the system performed in other types of terrain.

Each of the stations is using a common antenna, rather than separate antennas for the digital and analog signals. All use Harris ZHD transmitters and Harris Dexstar FM IBOC exciter with ePAL as the digital signal source.

The ePAL option, according to Harris, performs three main functions to enable configuration flexibility in an IBOC installation: synchronization and sample rate conversion to the analog signal, delayed audio bypass switching and digital audio distribution.

Ibiquity developed special HD Radio exciter and receiver software for the tests, the proponents said. While the RF modulation scheme remains the same, the audio coding was changed to allow for two channels.

Van ride

The tests began in August for KALW using a loaner Harris ZHD transmitter system.

The test van is equipped with a spectrum analyzer and two Kenwood pre-production HD Radio receivers. The first receiver is used for reference, a digital copy of the station's signal, while the second picks up the supplemental audio channel, said Mike Bergman, director of research and development in digital broadcast, for Kenwood USA.

Using GPS receivers, the van will record time and location data points 10 times per second, once every 100 milliseconds.

Using a spectrum analyzer, participants will track the desired station signals as well as signals from adjacent channels, Starling said.

"If the receiver starts to fail, we may see a contributing or casual factor, whether it's de-sensing" or something else, he said. De-sensing occurs when the receiver is overwhelmed because a nearby signal is stronger than the primary one.

If the signal experiences a certain amount of interference, the main channel would blend to analog, as normal in the Ibiquity system; but for the purposes of this test, under the same conditions, the supplemental channel blends to mute, participants said.

Participants want to see whether the supplementary digital audio channel still provides robust coverage when split from the main channel.

Torture test

By scaling back Ibiquity's IBOC FM bitstream of 96 kilobits per second, theoretically a station could use the remaining bits to carve out the supplemental channel.

For example, initial KALW tests focused on running the main channel at 64 kbps, with the supplemental channel at 32 kbps. Initial data integrity looked good, participants said. Preliminary results of the analysis should be available by late September.

San Francisco's hilly terrain presents interference issues and coverage challenges for FM stations. Starling called the city a "classic torture test for FM propagation," noting that the early IBOC tests were performed in the city.

By contrast, the terrain of Long Beach is well-known to Kenwood; it is the location of the company's U.S. headquarters. The Tomorrow Radio system is being tested in the Los Angeles Basin, with its valleys and canyons. Starling called it a "challenging propagation market." KKJZ will use the same loaner Harris transmitter system as used by KALW.

By the end of August, tests are due to begin at WETA.

All stations involved except WETA are using common amplification to develop the hybrid signal; WETA is using separate amplification, said Dave Agnew, Harris' FM applications engineer. WETA has HD Radio equipment in place; it has long been an Ibiquity test station.

Kenwood's Mike Bergman installs the Tomorrow Radio receiver in the test van.

NPR's Mike Starling with Tomorrow Radio test van

Phil Hartman of KALW(FM) and Dave Agnew of Harris Corp. pause in the transmitter room.

The tests will conclude in September at WNYC. The station will participate in the Tomorrow Radio tests and permanently convert to HD Radio at the same time. WNYC is operating two Z10CD transmitters in a main/alternate configuration. As part of WNYC's conversion, it will upgrade its main Z10CD to a Z16HDC operating in common amplification mode. The alternate Z10CD will continue to be used as an analog back-up and will be upgraded to a Z16HDC in the future.

Participants said Ibiquity's change of codecs did not affect the project.

This Kenwood pre-production Tomorrow Radio head unit is shown tuned to a Supplemental Audio Program channel.

Cam-D Test Stations Identified

by Leslie Stimson

Leonard Kahn expects field tests to begin by the end of the year on 10 stations conducting initial trials of the Cam-D digital AM broadcast system, including stations in Detroit and Salt Lake City.

AM stations to test his system include KKDS in Salt Lake City; WLQV, Detroit; KRCM, Beaumont, Texas; KRVN, Lexington, Neb.; WDVM, Eau Claire, Wis.; WJFC, Jefferson City, Tenn.; WJOK, Kaukauna, Wis.; WLYV, Ft. Wayne, Ind. and WSDS, Ann Arbor, Mich.

The general manager and owner of KRCM, Ralph McBride, said Kahn's system will "enhance" the effect of the Powerside AM stereo exciter.

"It emphasizes one sideband over the other ... so more of the signal survives interference," he said. "Cam-D will be a benefit to AM broadcasters who are not the biggest stick in town."

> 'The "core" stereo signal ... is an update of the sideband AM stereo system developed by Kahn Communications.'

The system promoted by Kahn is touted as an improvement over the Ibiquity Digital system.

"The 'core' stereo signal that guarantees Cam-D signals will provide an acceptable signal over the entire coverage range of the host station is an update of the sideband AM stereo system developed by Kahn Communications Inc.," states Kahn in a filing submitted to the FCC in April.

"This system ... will provide full-coverage AM stereo to 8 kHz. Audio enhancement components from 8 to 15 kHz will be transmitted digitally within the allocated 20 kHz bandwidth of the station. There are two methods of handling the additional frequency range, one which is favored at this stage of the development has been called the 'mixed-highs' system, which has a parallel in color television transmission."

Kahn states, "It's not necessary to transmit high audio frequencies as stereo signals, but merely as the L + R stereo sum signal, ignoring the L - R component. By using the mixed-highs technique, we can reduce the bandwidth required or we can reduce the required signal-to-noise ratio and increase coverage."

Several engineers contacted by Radio World said Kahn's submission lacks technical details.

"It's his old AM stereo system with data hiding under the signal to kick up the frequency response," said one engineer, who said Cam-D likely would be subject to noise, unlike the Ibiquity system.

In his filing, Kahn states he will provide test "equipment that can be switched for comparison purposes between conventional, full separation (at least 30 dB stereo) and mixed-highs operation above 8 kHz."

Philco Corp., Radio Corp. of America and Kahn Research Laboratories all separately proposed the concept of AM stereo to the FCC in 1958 and 1959. The agency denied a rulemaking on the subject at the time because commissioners did not see the same demand for stereo for AM that it had for FM.

By the 1980s, five companies, including Kahn Communications, had developed AM stereo systems. The others were Harris, Motorola, Magnavox and Belar Electronics.

In 1993, the FCC chose one system as the U.S. standard, C-Quam by Motorola. At the time, stated the commission, of the 660 stations using AM stereo, 591 were using Motorola's system while 37 preferred Harris and fewer than 20 were using Kahn's system.

The commission indicated that 26 manufacturers incorporated the Motorola C-Quam system in at least one model of radio; none used Kahn's. The agency adopted C-Quam as the standard, noting that 24 million receivers had been sold using that system.

The FCC does not track stations now using AM stereo.

Cleveland Gets Second HD Radio Station

CLEVELAND Three classical music stations in the United States are now on the air in HD Radio.

The third to throw the switch was WCLV(FM) in August. It also becomes the second radio station in Cleveland to go digital. Its AM sister station, WRMR, plans to go digital as well.

WCLV said it hopes HD Radio will produce reduced interference from adjacent stations, "which will be welcome news for WCLV listeners on the far east of Cleveland, who may have reception problems due to adjacent frequency stations in Geneva and Salem, Ohio," it stated.

The station began broadcasting in HD Radio using Harris transmission equipment on Aug. 14, the day of the historic blackout; the station lost power and went off the air that day due to the power outage. It resumed operation shortly afterwards.

When Catastrophe Strikes

by John Bisset

What a season of storms! Severe damage to both sites and equipment.

For example, George Seifert reports a fire that occurred at one of the ATU shacks for stations WONE, WARK and WQMX in Akron, where he is the assistant engineer.

Officials had no idea how the fire started, but storms usually are suspected.

If your AM parameters look wrong, maybe take a ride to the site and perform a thorough inspection.

Reach George at *rcrg_eng@hotmail.com.*

★★★

Scott Todd at KKMS in Richfield, Minn., writes that lightning does some strange things.

In June the station took a direct hit. In Fig. 1, the feed from the static drain to the bowl insulator was vaporized. The copper tubing leading from the Delta toroids was bent, as shown in Fig. 2, and its connection to the bowl insulator was also vaporized. Surprisingly, the Delta toroids survived.

A bolt of lightning provides an enormous magnetic pulse, and a device like a coil that will store such an energy pulse basically collapses under the tremendous field. Fig. 3 on page 19 shows the result of Mother Nature's fury.

Storm damage isn't just contained inside the coupling networks or phasor. Fig. 4 shows a waterlogged office. At first, one would expect heavy rain causing this flood. But lightning got to the building's water main. The pipe ran through a suspended ceiling, running next to a hanger. The

See WORKBENCH, page 19 ▶

Fig. 1

Fig. 2

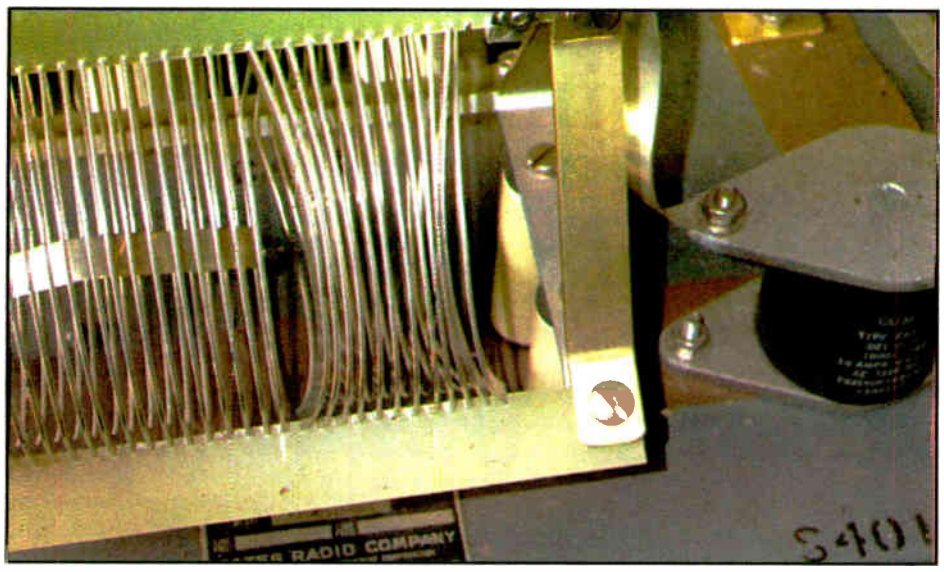


Fig. 3

point. Work out disaster strategies in advance. Compile a list of contactors: plumbers, HVAC and service people. Be sure to include the utility companies, local fire, police, sheriff and insurance claims agent.

Being prepared isn't just a slogan. For the engineer, it's a way of life.

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

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

Fig. 5

Workbench

▶ Continued from page 18

lightning punched a hole in the pipe, as shown in Fig. 5, causing the indoor flood.

Scott says there are a lot of lessons to be learned from such a disaster.

First and foremost, know the location of the water main cutoff valve. And just in case the engineer isn't around when things get messy, mark the valve so other staff can find it. In older buildings or transmitter facilities, the valve may be outside or associated with a water meter. Again, mark the location, making sure the valve cover is accessible and not buried in dirt, weeds or bushes. It will save your hide when an emergency like this occurs.

Don't know where the water valve is? Get the bill from the business manager and have the utility people meet you at the site. Then mark the location, and post its description inside the building.

Cleaning up after a waterlogged experience? Contact a company like Serve-Pro.

Fig. 4

They may trade their services. *You*, the engineer, have more important things to do than vacuuming water from carpets. Delegate the task to a company with the appropriate tools. Besides, most good business insurance will pay for this kind of loss. Your talents are best spent investigating equipment damage and correcting it.

Bring along a disposal flash camera or digital camera to document your findings. In some cases, it's necessary to clean up the damage to get the equipment on the air. Taking pictures of the damage before you correct it can be invaluable when filing insurance claims.

Reach Scott Todd at *stodd@kkms.com.*

Regardless of the emergency, you and your department probably will be the focal

NEWS MAKER

A Global Success Story Made in the USA

Larry Magne Prepares to Publish His 20th Edition of 'Passport'

by James Careless

The New York Times described the annual "Passport to World-Band Radio" as the TV Guide for world-band radios.

It's an apt description. The 2003 edition contains 300 pages of station listings by hour, country and frequency. It includes receiver reviews and buying advice, recommended world-band programs, special features and the names, addresses, phone numbers and Web sites of world broadcasters.

The Times is not alone in praising "Passport." On Amazon.com, every consumer who bought this book gave it five stars.

"Tells you everything you need to know," wrote Ricky W. Cancilla.

"Must-have for shortwave radio," stated Jolene Gerlach.

"Absolutely gotta have if you listen to shortwave," concluded an anonymous reviewer.

Meanwhile, Radio Netherlands' Media Network Web site enthuses that "'Passport to World-Band Radio' is the best all-round package for frequency information, programming listening advice and receiver test reports." Given that Media Network is not usually given to such outbursts, this is high praise indeed.

The accidental consultant

Its publisher cites online sales rankings in asserting that "Passport" now outsells the venerable U.K.-based World Radio Television Handbook annual. Perhaps surprising, then, is that the book is not the product of a major corporation, rather of an editor-in-chief, publisher and chief bottle washer, Larry Magne, and his handful of far-flung professional and volunteer radio monitors There is no big office tower housing "Passport," either. International Broadcasting Services is based at Magne's rural home in Penn's Park, Pa.

How did this small U.S. publishing house rise in the world-band directory market?

Like many successful people, Magne, now 62, didn't start out to be an expert in his topic. He was an MBA type whose working background was in mainframe computer systems design, starting with a college summer job at IBM in Paris in 1961 and continuing in the United States in the 1960s.

"Many years ago, I found myself somewhat trapped indoors in a high-rise apartment," he said. "To help pass the time, I bought a top-end Drake R4B receiver and used a alligator clip to attach its antenna connection to my window frame.

"I soon noticed that an awful lot of international shortwave stations had real transmission problems," he said. "Some were co-channeled with other stations, while others had poor modulation and generally sounded terrible."

This was circa 1970. Wondering how these stations could spend so much on shortwave broadcasting and yet sound so bad, Larry Magne began pounding on their doors.

"Soon I found myself with a couple of monitoring contracts," he said. "Suddenly I'd become a radio consultant who found himself specializing in anti-jamming technology."

As the Cold War wound down, Magne's roster of international broadcaster clients began to thin. Mindful of his experience writing receiver reviews for the WRTH, Magne decided to publish his research in print form as "Radio Database International."

The first edition came out in 1984 in two volumes and soon caught the attention of the international shortwave community. In 1987, the name was changed to "Passport to World-Band Radio." The title was clearer and encompassed extensive receiver reviews in addition to station information.

Over the years, the annual print run has "ranged anywhere from 40,000 to 80,000 books a year," Magne said. "We'd rather print a few extra and throw them away, than have to do a second printing." The business is Magne's main source of income; he also continues to consult to international broadcasters.

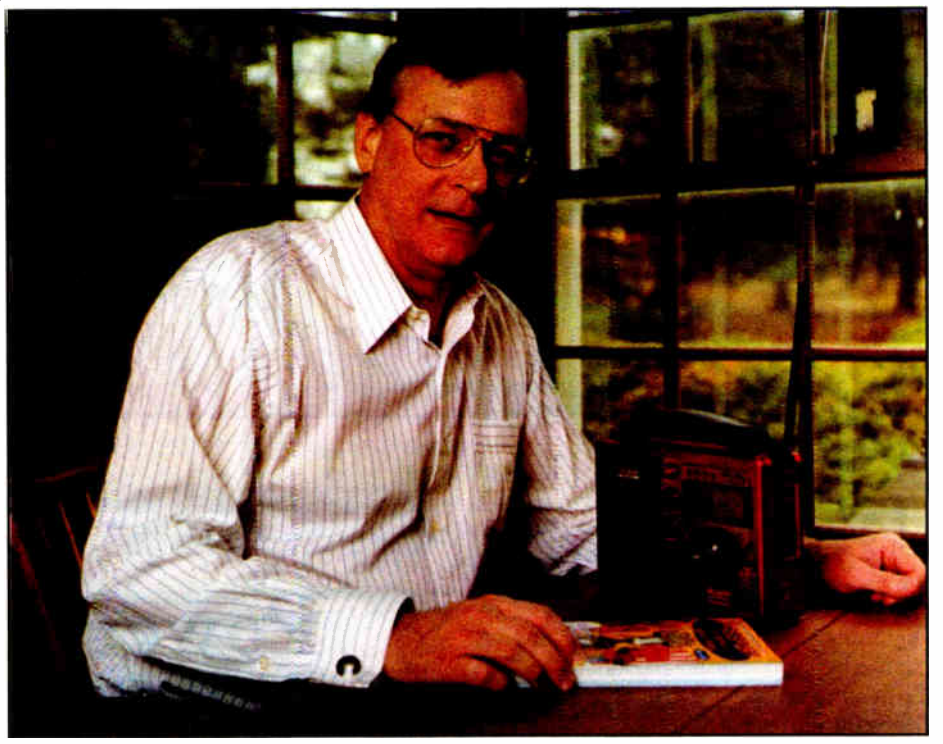
> **There's very little point trying to reach these people over the Web ... when so many of them don't have telephones, televisions or even electricity. ... It's far from being a 'dying medium.'**
>
> **— Larry Magne**

Reference

Why is "Passport" so successful? Perhaps it's the computer-compiled "Blue Pages" at the back of the book.

Starting at 2310 kHz and working up in 5 kHz steps to 25820 kHz, the pages list the occupants of each frequency on a 24-hour basis, including countries, radio broadcasters, transmitter locations and power, target areas, modulation modes and even alternative frequencies. Many shortwave hobbyists feel there is no more complete, accessible source to find out what they're listening to.

"We compile the Blue Pages from a number of sources," Magne said. "Since many international stations don't stick to any kind of transmission schedule, let alone publish it, we rely on our international network of monitors to keep our listings accurate and up to date."



Larry Magne

In fact, each year's Blue Pages are finished just three weeks before "Passport" goes to press.

The Blue Pages are "Passport's" claim to fame, a legacy from 1984, when Larry Magne bought the first IBM XT PC he could find and started cross-referencing his monitoring data. Equally important are the annual's receiver reviews. Written in clear, often witty prose, these reviews manage to combine extensive technical detail with tight, breezy commentary.

Reviewing the $359.95, cassette-tape-sized Sony ICF-SW100 ultra-portable, "Passport" wisecracked, "Don't leave Langley without it."

Meanwhile, the $54.99 Chinese-built Kchibo KK-3E20 "is strictly K-cheapo," said the 2003 review. "The KK-E320 is the first radio 'Passport' has tested that always turns off after a given time, like a coin-operated washer."

Once the latest edition is out, the publisher offers regular receiver updates at *www.passband.com*.

With the range or radios and accessories tested each year, it is clear that Magne has come a long way from writing a handful of WRTH radio reviews.

"We didn't have enough money to actually buy the radios back in 1977," he recalls. "The best the editor could do was to give me $300, which I spent driving from place to place to test radios out. At one house, the owner thoughtfully threw me a party complete with cake and a banner. However, he was so busy trying to entertain me, that I only got about two minutes' tuning time on his receiver."

All this and Gahan, too

Beyond its content, "Passport" is renowned for featuring shortwave cartoons by Playboy artist Gahan Wilson on its cover. The relationship started many years ago, when Magne received a book order and complimentary letter from Wilson.

"I recognized his distinctive handwriting on the envelope," he said. "Musing on it during a shower the next morning, I thought 'Why not: I'll ask him if he'd be willing to draw something for us.' Thankfully, he agreed."

Today, Gahan Wilson has become as synonymous with "Passport" as "Norman Rockwell was with the Saturday Evening Post," said Magne. "Once we put out a Web radio book that didn't have a Wilson cover. As soon as the book reps saw it, they were screaming for us to get a Gahan Wilson cartoon on the front." Which Magne did in the second edition.

Today, Magne and his team are working on the 2004 edition, his 20th. He says that, thanks in part to events in Iraq, sales are up around 10 percent so far this year. The book retails for $19.95; it will increase to $22.95 next year.

"World-band radio is a crisis medium," Magne said. "During the Cold War, for instance, listenership to Radio Free Europe would jump seven-fold every time the U.S./Soviet rivalry heated up."

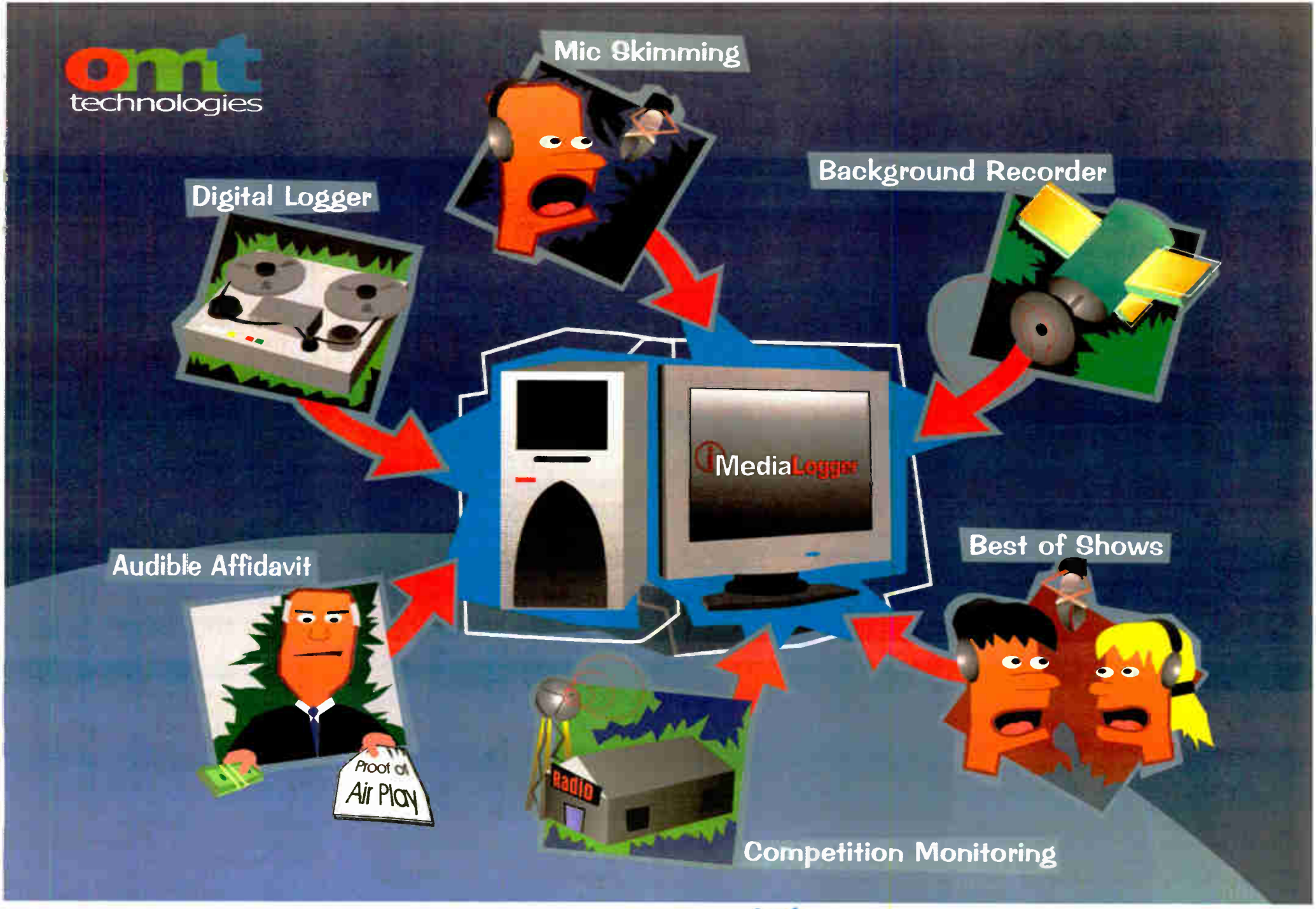
He isn't worried about world-band radio being supplanted by the Internet.

"For broadcasters, the Internet is a point-to-point proposition; you pay for every listener you get through bandwidth and server costs. In contrast, radio costs the same whether you're reaching one listener, or a million."

Meanwhile, based on the BBC's research, there's 650 million people tuned into shortwave worldwide, a number equivalent to the number of Internet users globally.

"Shortwave radio is still the medium of choice for poorer people outside of North America and western Europe," he said. "There's very little point trying to reach these people over the Web, which some Western broadcasters are trying to do, when so many of them don't have telephones, televisions or even electricity. This is why I still see great opportunities in shortwave; it's far from being a 'dying medium.'"

In fact, North American world-band radio sales have been rising for the past 15 years — "and this is continuing to the point where some better models are often sold out," Magne said. "It's counterintuitive, but true."



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Designing for the Unexpected

How Do You Plan and Manage a Facility Project While Taking Terrorism and Disaster Into Account?

by George W. Crowe

The author is a consultant and former head of radio engineering for the BBC. This article is adapted from a paper he presented at the NAB2003 convention.

In the early hours of March 3, 2001, a car bomb exploded outside the BBC's Television Centre in West London. The image was flashed round the world within minutes. In daylight, the resulting damage was clear to see.

Organizations such as the BBC usually have invested in resilience, and have a set of contingency plans, which enable such events to be handled with minimum loss to the output. In this case there was no disruption to the program output; and the main newsroom, located immediately behind the shattered windows, was back in use within the week.

However, such major events are comparatively rare. This was only the second bombing of a BBC building in the United Kingdom in its 75-year history. (The previous one was from a bomb dropped by a German aircraft during the war.)

But less-dramatic unexpected events happen much more often, so broadcasting facilities of all shapes and sizes and in all locations share the need to be designed and built to withstand them. Regardless of the size of your station, it pays to be ready for the unexpected, if you don't want to go off the air just when you are most needed.

Self-inflicted wounds

Not all unexpected events are the result of an external influence. They often are self-inflicted. Broadcasters live in a world of developing technology, changing production techniques and new developments in programming, all of which will make new or different demands on the building.

Unfortunately, buildings generally do not respond easily or quickly to change. For example, a new program idea for a series, which, say, takes 24 hours to think up, might well need additional accommodation, power, air conditioning, technical facilities and communications. Adapting an existing office might take 24 weeks, and building from new easily could take 24 months.

Buildings can be designed to be flexible, thus to reduce refit timescales significantly. But such flexibility needs a high level of initial investment, which must be justified. In 2001, when the BBC began a major redevelopment of its main buildings, it took the opportunity to make sure, as far as possible, that the unexpected was catered for. During the design phase for three new major facilities, the BBC has tried to avoid some of the major pitfalls.

Design for resilience

To achieve any degree of resilience above that of a normal building, a broadcast facility needs:

The concrete frame is cast at the BBC's new Broadcasting Centre in West London.

- An appropriate level of investment in standby and emergency systems.
- A well-thought-out and tested plan for dealing with unexpected incidents.
- A procedure to review and test the plan regularly, ensure proper maintenance and test equipment and systems regularly.

Often when a new facility is being built, a lot of money is invested in standby systems. However, over time, complacency may set in, leading to a failure to review, update, practice and test. When the unexpected happens, it is not surprising that things don't go to plan.

Invest for resilience

Significant investment in well-designed standby systems is required in order that they perform well under emergency situations. When selecting standby plant, it is best to adopt an "N+1" approach, as shown in Fig. 1.

This principle can be extended to other vital services — gas, fuel oil, water and fresh air. Each will have their particular requirements, which must be met if the facility is to achieve the resilience required.

Server rooms and other densely packed equipment areas are vulnerable to a rise in ambient temperature. This means that a standby cooling system — and the power to run it — are just as essential as standby power.

Justifying the investment

A good standby system and plan do not make programs or generate revenue, so they can be vulnerable to the inevitable "economies" that occur when an investment is being considered.

One way to ensure that they maintains their rightful priority is to use a systematic Risk Assessment-based approach for its evaluation, as seen in Fig. 2. Risk Assessment is familiar from its application in the health and safety field. It often is used to ensure that all possible hazards have been considered and that all practical control measures have been taken.

Plotting these on a simple chart helps to get the message across, as seen in Fig. 3.

Major threats to resilience

Every facility is vulnerable. The risk assessment technique should include the following:

- Failure of incoming electricity supply
- Failure of incoming gas supply
- Disruption to fuel oil supply
- Failure/pollution affecting incoming water supply
- Fire & explosion within the building
- Fire & explosion within adjacent buildings
- Flooding, internal and external
- Pollution/contamination of incoming air
- Civil disturbance

Planning involves "thinking the unthinkable." However much is invested in protection, there is always the risk that a building will become unusable for a period of time.

A well-thought-out plan will identify how, where and by whom an alternative service might be provided, probably from an entirely different location. It is crucial to identify the point beyond which, further investment in resilience becomes counter productive.

Design for flexibility

A broadcast facility is subject to change caused by developing technology, changing production techniques and new directions in programming. Such changes are likely to lead to unpredicted adaptations to the building and its services.

Fig. 1: Example of "N+1" approach

Consider a standby power requirement of 200 KVA. If that were to be provided by a single generator, probably the most economic solution, the facility would remain vulnerable to a failure of the automatic starting system, and to a supply failure, which occurs during a maintenance period.

2 x 200 KVA sets would provide much better resilience, but over double the cost, and some increased complexity of the control system.

The optimum solution would probably be 3 x 100 KVA or 5 x 50 KVA generator sets. Such configurations allow one set to be taken off-line for maintenance while maintaining full protection with the others. Two separate machine rooms, located in separate fire cells, would enhance the resilience still further.

Although it is clearly not possible to predict when and where they will occur, it is possible, using the lessons of history, to set down some headlines for consideration.

During the design phase of a new facility, the design team should consider:

See UNEXPECTED, page 23 ▶

MARKET WATCH

SoftWright, Slattery Form Software Alliance

Two software companies have formed an alliance, saying they can make it easier for users to calculate radio coverage and microwave path design. The companies are SoftWright and Slattery Software.

"Obtaining authorized frequencies has long been a challenge for designers of radio systems," they said in a joint statement. "Now the FCC has placed all this information on their Web site so that it can be used for coverage predictions, interference studies and many other types of studies.

"For many years, once an engineer did his best to locate all the necessary information locally, engineers had to manually enter all the geographic coordinates, antenna height, frequency, power and other details into their RF design software in order to perform engineering studies. Recently, some software companies have begun acquiring and reselling this data, even though the FCC makes the data available to the public at no charge."

The alliance is intended to help customers in dealing with the FCC format, the companies said.

They released new versions of software that support these capabilities. They use an open-architecture Facilities Exchange File format to facilitate the transfer of FCC records of land mobile radio, microwave and other engineering details from the machine-readable records of the commission into a way to view the data and process radio coverage maps, microwave path design and intermodulation studies.

Slattery products help users with FCC software for form filling, electronic filing, frequency searches and data analysis. SoftWright provides RF system design software. Slattery Express is a bridge between the FCC database and the SoftWright Terrain Analysis Package software.

For information contact Softwright in Colorado at (303) 344-5486 or visit www.softwright.com *and Slattery Software in Florida at (941) 697-8008 or* www.slatterysoftware.com.

Unexpected

▶ Continued from page 22

- Location
- Floor loading capacity
- Column spacing
- Electrical intake capacity
- Cooling system capacity, or at least roof space to increase it
- Floor void capacity
- Zoning of floor layouts, in particular the routing of primary services

Additional floor loading capacity is relatively cheap to build from new, but expensive and often impossible to retrofit. Extra capacity, over and above the standard specification level, is essential if even a modest degree of acoustic isolation is required. There is, unfortunately, no substitute for mass when it comes to keeping the sound out.

The decisions on floor loading capacity and column spacing are likely to be driven by constraints such as floor height, column size and, most of all, by money. It is tempting to ask for wide spacing, but except for specialized areas such as newsrooms, large TV studios or large control suites, it often is better to specify more-modest spacing and reap the benefits of a more-economic construction, stronger floors and a lower overall building.

At the BBC's new Broadcasting Centre, under construction in West London, this evaluation was carried out over several months, involving the end users in testing the various layouts proposed by the design team. The optimised solution reached was a column spacing of 9 meters (30 feet) with a square grid and a floor loading capacity of 150 lb/sq. ft. rather than the more conventional 100 lb./sq. ft. The concrete floor panels are free of obstructing "down stand" beams.

A photograph shows the concrete frame being cast, and an interior view of the building under construction, showing the flat slabs.

During the building's fit out, care is being taken to route all of the primary services along pre-defined zones, keeping them away from the occupied areas as much as possible. In the future, if an acoustic enclosure needs to be built from concrete floor to ceiling, there will be no need for expensive rerouting of primary supplies.

The choice of a displacement air conditioning system, supplemented by chilled beams, was influenced by the low maintenance costs, minimal downtime and high degree of flexibility. In contrast, the more-conventional fan coil systems require lots of piping in the vulnerable ceiling void. They generate noise and need regular maintenance, a real problem in a 24/7 operation. Floor-mounted fan coils are only used to cool individual hot spots, small studios and post production suites.

At the heart of the building is a two-level equipment room capable of housing more than 800 equipment racks and protecting them from all known hazards. A lot of thought has gone into cable distribution systems and into how the layout will accommodate future expansion of the playout business — the primary reason for the building.

When it happens

Sooner or later, the unexpected will occur. A successful response depends as much on the management of that incident as it does having the correct standby facilities.

The immediate response to an incident might well be triggered by one of the facility's automatic systems. Systems will inevitably interact with each other in an unpredictable way. Correctly designed, installed and maintained standby systems give time to react and for the tactical incident plan to begin to operate. But the length of that honeymoon period is unpredictable and can sometimes be very short.

The Incident Management Plan consists of:

- Who is in charge
- What they need to do
- Who do they need to communicate with
- How will they communicate

At the same time as the systems are being designed, the operational management need to be encouraged and helped to develop their incident management plan. This is often a good way of involving operational personnel in the design process.

Incident management plan

The nominated incident manager, to be effective, that person (or probably people) will need information, procedures and training. He or she will also need a location to operate from, and a reserve location, just in case.

The plan needs to be tested regularly, updated as circumstances change and as the people involved change. It is easy to neglect these elements as time passes. The result can be disastrous.

Obviously, the size and complexity of the plan needs to match the station, but even the smallest facility should have one.

In the case of the BBC Television Centre bomb, the BBC received a telephoned warning. The BBC's well-thought-out and tested management plan took effective control, prevented serious injury and kept the station on the air.

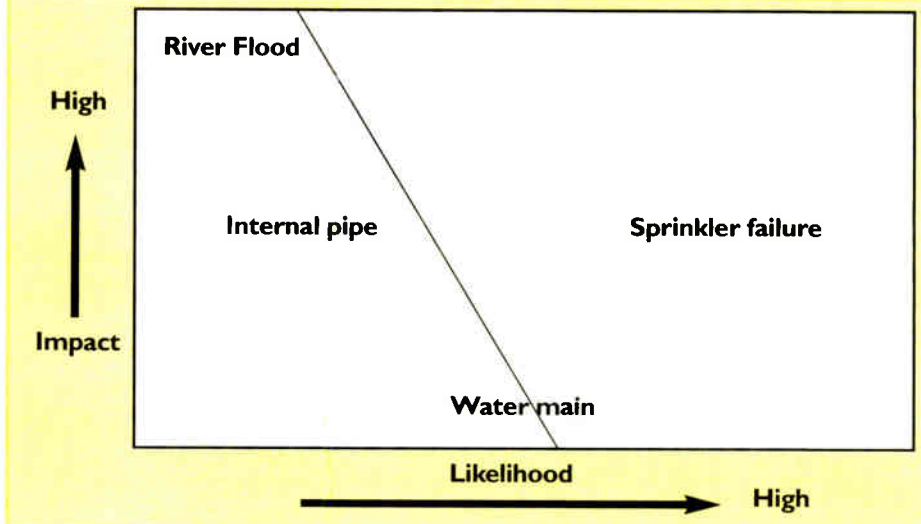
At least once a year, those involved

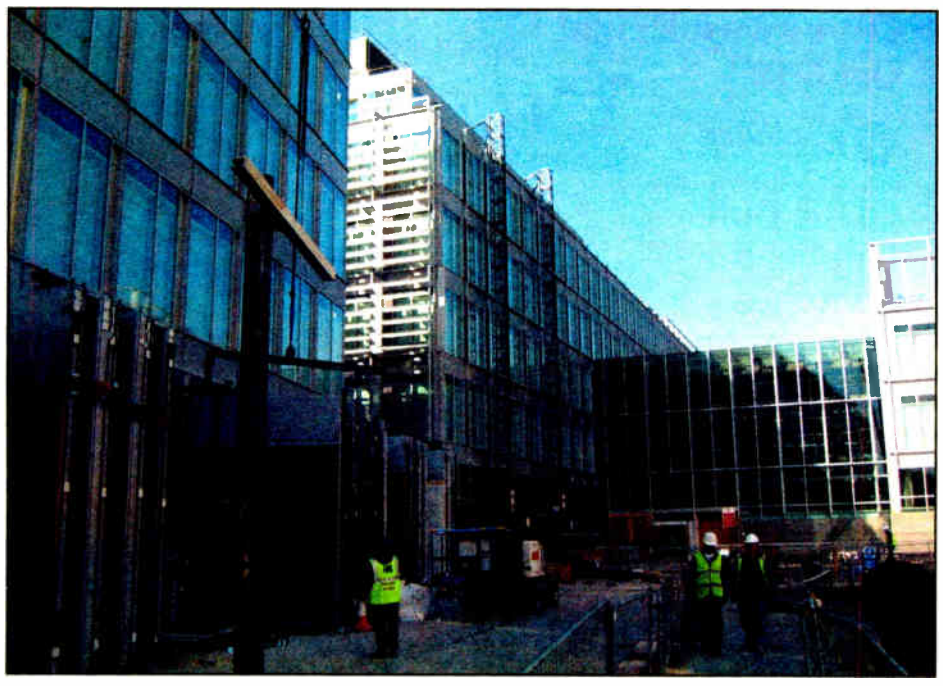
See UNEXPECTED, page 26 ▶

Fig. 2: A Resilience Risk Assessment for Flooding

Risk	Likelihood	Impact	Response
Adjacent river overflows due to storm overload	Very Low	Very High	Include within evacuation plan
Water main in street fractures due to corrosion & traffic	Medium	Low	None necessary for flooding. But prolonged failure of water supply to building requires a contingency plan for that risk
Failure of internal pipe due to corrosion	Low	Medium	Sump pumps Floor isolation
Failure of internal sprinkler pipe or head	Medium	Medium	Sump pumps Floor isolation

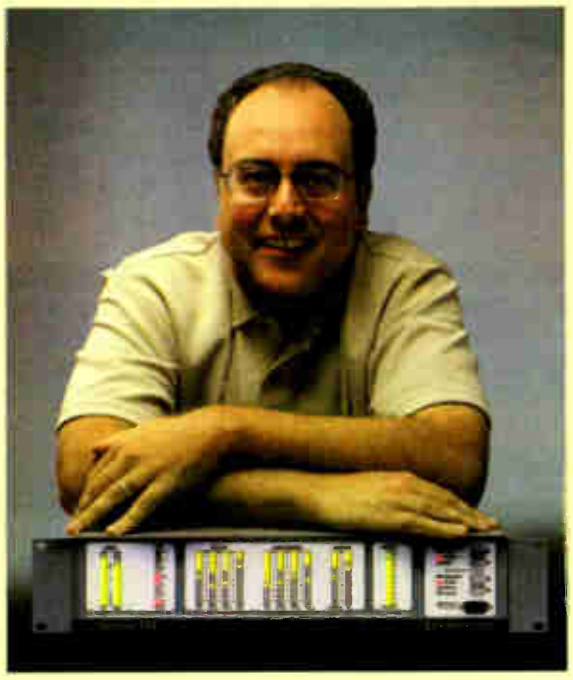
Fig. 3: A simple chart helps to get the message across.





The Broadcast Centre nears completion.

Want the facts about processors, co



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Broadcast Supply Worldwide's Sales Order Center looks nothing like this stock photo we found.

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- **Low latency – monitor off air!**

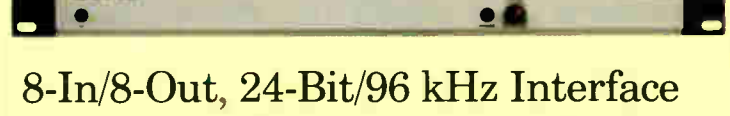
BSW just made the processor buy of the year! We have the all-digita by Inovonics on sale for only $4,495^{00}$. If your station is looking for a n powerful sound in 2004, call us to discover the affordable Omega_FM

The Omega_FM is a full-featured FM processor/stereocoder. It does application-specific DSP chips, instead it applies Pentium-class compu directly to processing and stereo-generating functions. It may be used of the box with no programming required. Nevertheless, connecting a

BSW's 30th Anniversary Giveaway is almost over – get in on the final prizes! Enter at www.bswusa.com

Giveaway Prize!
Sept 15-21

ECHO digital audio



8-In/8-Out, 24-Bit/96 kHz Interface

Get high quality audio in and out of your computer with the Layla24 from Echo. The Layla24 uses the latest generation 24 bit/96 kHz converters. It has eight balanced 1/4" analog inputs, eight true differential, balanced outputs, and a superb headphone output. Furthermore, the Layla24 can handle virtually any sample rate! ADAT lightpipe, optical S/PDIF, and coaxial S/PDIF are included, as well as MIDI in/out/thru and a new "cool-running" power supply. The Layla24 comes with a 15 ft. host cable that connects the rackmount interface to a PCI bus master interface card.

The September 15-21st Prize Package comes with Cakewalk's Sonar 2.2 recording software and a Sennheiser HD202 headphone. Enter our 30th Anniversary $30,000 giveaway today at www.bswusa.com!

LAYLA24 List 995^{00} **699^{00}**

Giveaway Prize!
Sept 29-Oct 5

JBL PROFESSIONAL

Compact Powered Speakers

The new EON10 G2 compact powered speaker features a 10" woofer, increased amplification from its predecessor and a three input mini-mixer. It's ideal for AV applications and smaller performances, with 125 watts for low frequencies and 50 watts for the highs. The 10" Differential Drive low frequency driver uses a neodymium magnet for light weight and reduced distortion. The one-inch JBL 2412 compression driver for the high frequencies includes a titanium diaphragm and ferro-fluid cooling.

The prize package features [2] JBL EON10 G2 powered speakers and a 50 ft. cable for parallel operation. Buy them today or enter to win.

EON10G2 List 619^{00} **499^{00}/each**

Giveaway Prize!
Oct 6-12

MICROBOARDS Technology

CD-R Bulk Duplicator Switches Masters on The Fly

The new Microboards MicroOrbit self-contained 40x CD-R bulk duplicator has a 50-disc capacity and can switch masters on the fly! One button operates its simulation and copy modes. Masters are read into the internal hard drive through the recorder, eliminating the need for a separate reader. Masters and blanks can even be interleaved on the input spindle to allow for batch mode processing – when the system recognizes a new master, it reads it into the hard drive, then ejects the master into the output bin and starts recording the next series of blanks.

The lucky Prize Package winner also receives two 50-pack spindles of CD-Rs!

ML1000-02 List $1,295^{00}$ **995^{00}**

CDR80ZZSB-ZM List 49^{50} **27^{95}**

Giveaway Prize!
Oct 13-19

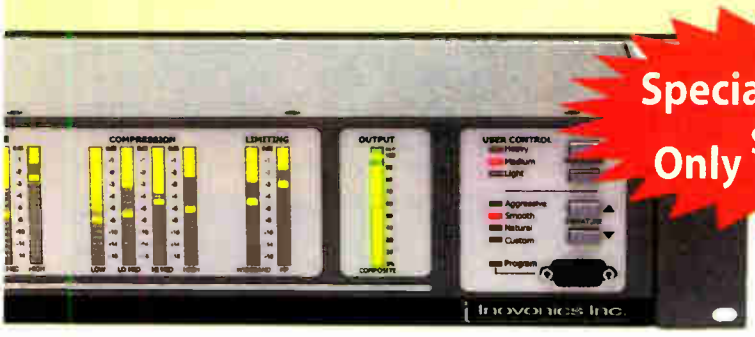
Dual-Woofer Biampli Monitors for Accurat

Mackie's powered HR626 monitors reference monitoring and accurate, di free lows. The unique design allows fo or horizontal setup, with one 6.7" wo end and a waveguide-loaded aluminu tweeter in the center. The flat-frequer provided by an active EQ, crossovers correction and phase alignment provi reference monitoring. XLR and RCA to 250 watts power with overload pro

The HR626 is priced as each; but th package features a pair. That's a $1,49 price value! Enter to win at www.bsw

HR626 List 899^{00} **749^{0}**

nsoles or hybrids? Just call Paul...



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running the supplied software places almost all processing parameters under local (or remote) user control.

Of particular significance is the Omega-FM's short program signal path. This keeps program audio clean and assures negligible 'latency' or audio delay, allowing direct studio monitoring of the off-air signal.

Other features include gated, intelligent gain-riding AGC; multi-band leveling; wide-range, triple parametric EQ and multi-band compression; split-spectrum final limiting for optimal carrier deviation.

Despite its modest price, Omega_FM challenges the versatility and performance of any processor on the market. Get the ball rolling today.

OMEGAFM List 5,880.00 **4,495.00** Inovonics

AUDIOARTS ENGINEERING

12-Channel Console Packed with Performance

A truly no-nonsense unit with plenty of usability, the new Audioarts R55 modular console has 12 channels and 4 busses and offers a monitor module with talkback, an output module with program, audition, pre- and post-mono fader outputs, plus independent meter selection, and much more. **Features:** built-in cue speaker/amp and headphone jack/amp; stereo program and audition busses plus two mono output busses. Plus BSW adds a Free phone module with your new console. Call to order today.

R55 List 5,795.00 CALL FOR PRICE

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ludes: [2] direct-drive
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ital outputs, advanced key-
ust (change the BPM without
nging the pitch), reverse
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520SK cartridges; [1] DJ PRO 60 stereo headphone, and a
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h turntables and a built-in 9U angled rack. Enter today!

ANIUMPAK List 1,545.00 **799.00**
B5817DJ List 619.95 **359.00** STANTON

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The 6301BEAV is the perfect personal powered monitor and excellent to take along on remotes. **Features:** built-in 10-watt amplifier; magnetically shielded to protect nearby computer monitors; rotary level control; automated protection circuitry; balanced XLR and phone jack inputs. Priced as each.

SLA1 List 279.00
159.00/each FOSTEX

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Sony headphones are some of the most popular in the world, and at only $99.00 the MDR-7506 is an outstanding choice. This top-selling studio headphone delivers a wide frequency response of 10 Hz-20 kHz in a comfortable, sealed-ear design which provides maximum isolation from external sound. A favorite of broadcasters everywhere. Order today!

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DH20 List 995.00 **899.00**

Routes Six Phone Lines to Telephone Hybrids

The new Broadcast Tools TeleSwitch 6 routes up to six phone lines to most telephone hybrids. It can handle one hybrid and a standard single line call screening telephone set. If full call screening is not required, a second hybrid may be connected. The TeleSwitch 6 is supplied with one desktop switch console and a 1-RU controller. It even includes free switching software!

TS-6 List 829.00 **769.00** BROADCAST tools inc.

AES/EBU-to-S/PDIF Interface/Distribution Amp

The new Henry Engineering DigiMatch 2x6 is an AES/EBU-to-S/PDIF interface and distribution amplifier, mountable 3-up with other Henry 1/3-rack-space units on an optional rack shelf (model #RMA). It has one AES/EBU input and three AES/EBU outputs, plus a S/PDIF input and three S/PDIF outputs.

DIGIMATCH2X6 **269.00**
RMA (rack shelf) **50.00** HENRY ENGINEERING

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FIRST PERSON

Beware Funky Phone Lines

by Paul Kaminski

Road warriors, this one's for you.

Until cell service is as inexpensive and robust as wire-line, anyone who has to perform a broadcast outside the studio must deal with dial-up lines and the dangers they pose for our equipment. One such battle cost me a PCMCIA X-jack dial-up modem and 10/100 Ethernet/LAN card on a laptop.

It didn't have to happen.

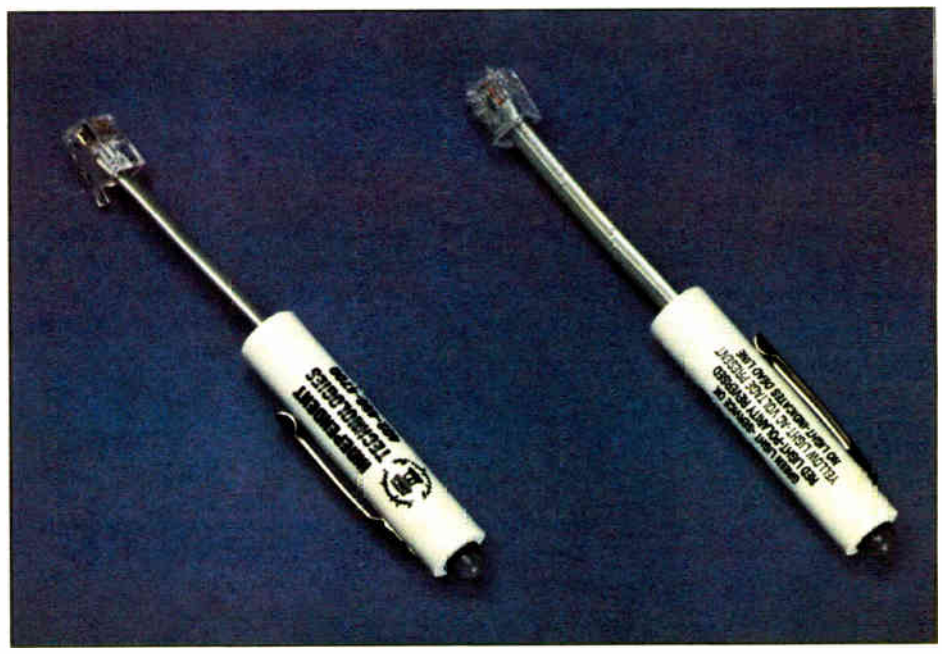
Fried

I was preparing to send a feature wrap via e-mail from the Air Force Museum at Wright Patterson Air Force Base in Dayton, Ohio, to CBS News in New York. The staff at the museum — a great place to visit in this 100th year of powered flight — set me up in a conference room to edit and transmit the piece over an outside line.

I connected the modem cord to what looked to be a standard RJ-11 line jack. I discovered when monitoring the modem tone while the line was connecting (or attempting to connect) that the line had much more than the 48 volts DC usually found on a normal dial up line.

How? When I heard music, not the usual modem noise and then silence, I knew something was wrong. I tried to connect on two other lines at other locations and got a message saying the computer couldn't recognize the modem. I abandoned the effort and tried to fix the problem.

You'll wonder why I said it didn't have to happen. For my RemoteMix 3 remote mixer, I carry a RJ-11 line tester made by Independent Technologies of Nebraska. The device has a LED system that gives indications for AC voltage present on the line, reversed polarity, normal polarity and no service. It has an RJ-11 connector that is plugged into the jack in question. Had I plugged the tester into the line before connecting the computer, I would not have fried both the modem and 10/100 cards, because I would have seen the yellow indicator and not plugged into that line, which contained enough AC to fry the cards.



This RJ-11 line tester is made by Independent Technologies of Nebraska.

Test once, use twice

The lesson here: Unless you test that telephone jack before you connect your laptop, POTS codec or other RJ-11 telephone device, you stand a great risk of having the same misfortunes I had.

It can happen to you and probably will do so when you least expect it. So take the extra minute to check the line before you set up, and save yourself that headache and unnecessary expense.

Some manufacturers have built safeguards into their modems that may guard against this happening. It's still better for your peace of mind, not to mention the contingency budget, to test every line, every time.

Many of my peers carry small telephones that they use to talk with and test lines. For the $10, that's not a bad investment. At a reseller such as Techni-Tool of Pennsylvania, for example, the Independent Technologies tester costs under $6. The tester takes up the same space as a felt-tip marker and will even work if the little tab on the jack is missing due to use. Something like this and a cord reel should be in your road kit.

IBM has marketed a device called the Modem Saver, which also indicates the presence of AC on phone lines. A search on Google ("modem saver") will get you more than a few pages of links to sources.

These devices are passive; they alert the user to the conditions dangerous to the equipment. There are active devices that will convert the digital line to a virtual analog line, safe for the equipment we usually use on the road (that's the subject for another test). One such manufacturer of those units is Konexx (konexx.com), with both active (their "Mobile Konnector") and passive devices ("ModemMinder").

This is by no means a complete treatise on protecting analog equipment from digital telephone lines. It is meant to stimulate your thinking and convince you to take the time to test the line before connecting the equipment, even when you are in a hurry.

Unless you test that telephone jack before you connect your laptop, POTS codec or other RJ-11 device, you risk the misfortunes I had.

Paul Kaminski is the Motor Sports Radio news director. He contributes reports to CBS Radio News. His e-mail is motorsportsradio@msrpk.com.

Two Sources of Protection

Independent Technologies Inc.
Omaha, Neb.
(402) 496-4700
Web: http://independenttech.com
(Note: This manufacturer will help you find a reseller)

Konexx
San Diego
(800) 27 -6354
http://konexx.com

Unexpected

▶ Continued from page 23

with incident management should take part in a "tabletop" exercise during which a facilitator will simulate a number of potential incidents on paper and, with each participant, talk through their planned response.

Testing the plan

Communications will be checked, telephone directory contacts updated. This process effectively identifies the sort of inconsistencies that creep in over time. The test is best supervised by someone who has not been previously been involved with the plan.

However, theoretical exercises can only go so far. They do not actually test the satisfactory operation of a resilient system; the only way to really check your standby power system is to deliberately fail the main supply. Also, they do not accurately simulate the human factors that come into play when the unexpected happens. Because the "tabletop" exercise is carried out in controlled conditions, no adrenalin flows.

To be really sure, once a year at least, check that the standby systems actually work as designed and that the incident managers can act satisfactorily under pressure. This really means that there is no substitute for the "live test."

An atrium of the Broadcast Centre, seen in an architect's computer simulation.

In conclusion, a broadcast center often needs to be designed with a higher-than-normal amount of resilience as compared to a conventional office building. This requirement flows both from a public service remit and from commercial drivers.

A design that allows the right degree of flexibility to cater for an uncertain future will pay dividends.

The main hazards are relatively easy to identify; but the risks that flow from them need to be evaluated systematically to ensure that the optimum level of investment in standby systems is selected. A Resilience Risk analysis technique as described here has been shown to be effective in this process.

The importance of drawing up an incident management plan and ensuring that there is a nominated person to take charge cannot be over-emphasized.

Even the most carefully engineered systems are liable to fail if they are not regularly audited, tested and maintained. The auditing and testing must include the human factors. If this is done, evidence shows that broadcast facilities can be recovered from serious events in a short space of time. If it is ignored, the commercial and public service consequences can be severe.

George Crowe spent 12 years as head of radio engineering at the BBC and nine years leading the organization's internal property team. In the 1990s, he produced a strategic report that led to major projects now in progress, including the redevelopment of Broadcasting House and the development of a new Broadcast Playout Centre at BBC White City. He left the BBC in 2002 and is now a consultant. His clients include Land Securities, a property developer, which is responsible for developing the BBC's properties under an outsourcing contract.

Reach him via e-mail to croweg@ukonline.co.uk.

THE BIG PICTURE

Charting a Radio Course

Commercial and Noncommercial Stations Part Ways In Their Pursuits of New Media Opportunities

by Skip Pizzi

An important part of any strategic planning process involves a revisiting of an entity's fundamental mission.

For a radio station, this mission varies with the licensee. Most commercial stations' primary mission is to generate revenue — just like any other profit-making business. Meanwhile, noncommercial stations can have a variety of missions, ranging from evangelical to educational.

An interesting subset is the mission that most public radio stations across the United States have adopted. It hearkens back to the earliest days of radio, in that its primary mission is the presentation of reliable information and quality entertainment to a wide audience.

In this respect, it could be considered the "purest" form of radio, but this creates the incorrect notion that other missions are somehow "impure." In fact, it simply indicates an important contrast in purpose, and is testimony to the great flexibility of the medium, as evidenced by its ability to accommodate such a range of business models.

Basic identity

A premise I often cite to my consulting clients is that "Radio is what we do, not what we are," which summarizes the points above.

Radio stations therefore are not just radio stations but media outlets used for a variety of actual business purposes. All of these purposes harness the power of radio to reach people in some way, and most involve some method of monetization of this process.

For some licensees, that monetization is their core business, while for others any revenues produced are used simply to support the primary broadcast mission. The latter mission is a function that could likely be (and often is) served by other media, such as print or TV; but radio seems to provide an optimal method for targeting certain behavioral moments — e.g., reading the news aloud to someone driving to work in the morning.

Less is more to commercial radio, while more is better to public stations.

The point of all this is that whenever one explores new options, it's important to have a crisp understanding of one's true purposes. Simply defining oneself as "a radio station" is therefore inadequate to such analysis.

Clearly defining the underlying business model is necess. to determine how to best proceed. Given that business models diverge so widely among today's radio stations, it is possible that neighbors on today's dial may take very different paths into the new media landscape.

Said plainly, if radio is truly just what we currently do, and not what we are, then what we *really are* will shape what we *should do* in other media ventures.

A fork in the road

Thus it becomes clear that some radio stations will make different decisions than others regarding their migration into new media.

Let's consider two predominant U.S. models, commercial and public radio. As noted, commercial radio is primarily about delivering advertising, while public radio is primarily about delivering quality content.

(This does *not* mean quality content does not appear on commercial radio. In fact, it generally *must* be included there in order to attract listeners to the advertising that surrounds it, just as Radio World and other magazines do. What we're talking about here is the business, not the service, however, so the reasoning behind *why* the content is there becomes more important to the analysis.)

Following this line, it becomes apparent

See PIZZI, page 29 ▶

The Big Picture

Photo: Gary Hayes, BBC

by Skip Pizzi

Products & Services SHOWCASE

Telephone Solutions by CircuitWerkes

The HC-3 hybrid telephone autocoupler

The HC-3 is ideal for many tasks like listen & concert lines, remote broadcasting, IFB interfaces, & More.

The *New* Telco-6, six line, incoming, ring detector

Is someone calling? Find out with the new Telco-6! The telco-6 detects telephone ring signals from one to six lines and provides a dry relay output for each line.

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Did you ever connect a telephone coupler to a phone line or PBX only to discover that it won't hang up? CircuitWerkes' call progress decoders can save the day on most systems. They listen for dial-tone or busy signals and, when present, force your couplers offline.

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Get up to a dozen, full featured, telephone autocouplers in just 5.25" of rack space. The coupler bay features a common power supply and two audio busses for easy mass feeds. Individual couplers can be used for sending or receiving seperately from the rest - perfect for IFBs. Newly updated design improves audio performance and overall reliablility to a new standard of excellence!

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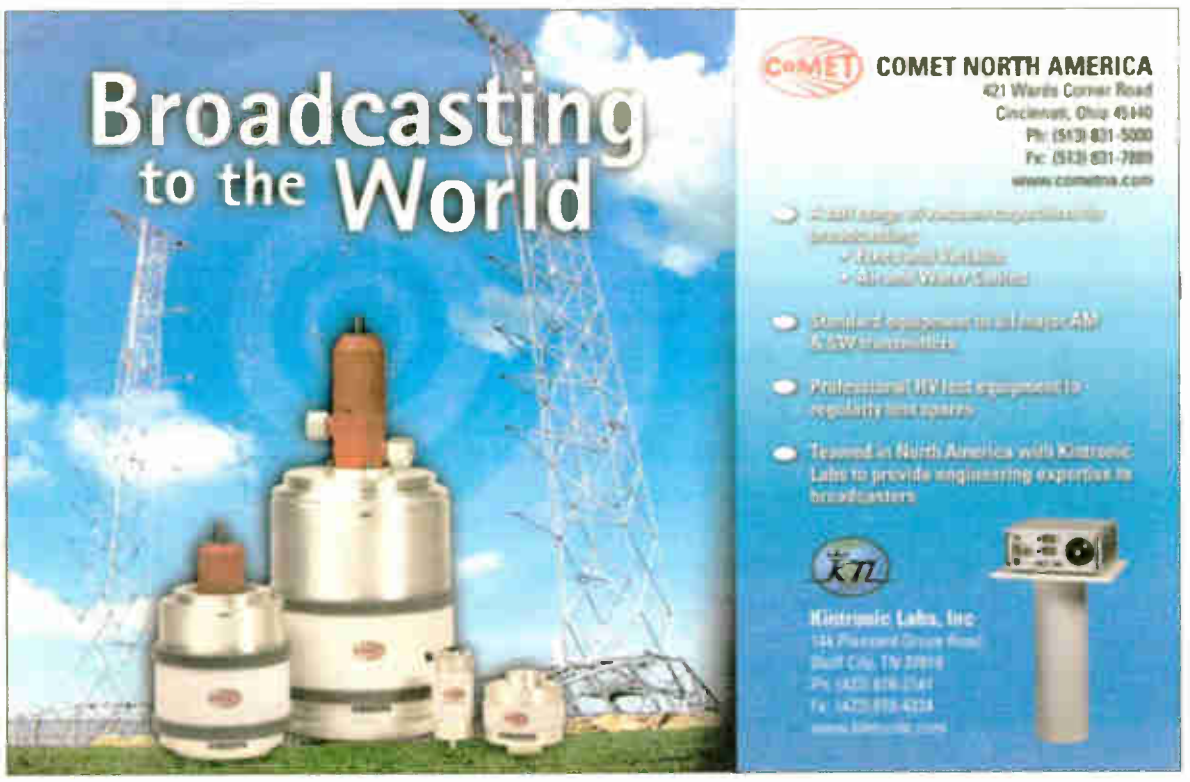

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Pizzi

▶ Continued from page 27

that the primary success metric for both services is audience size, but for different reasons. A commercial station uses this data, including its demographic details, as an empirical value indicator to its primary customers (i.e., advertisers), in order to set its rates and differentiate itself from competitors.

A public radio station uses this same data as a measure of how well it is satisfying *its* primary customers (i.e., listeners), and adjusts its content accordingly to maximize listener satisfaction, thereby increasing their voluntary contributions.

Admittedly, this distinction is a porous one, as some commercial stations use audience research purely to measure listener satisfaction, and some public stations use it to sell sponsorships. Yet when it comes to new media, the division is pretty hard and fast: Less is more to commercial radio, while more is better to public stations.

In other words, fewer channels means more concentration of audience and higher advertising rates across the board for commercial operators, while public radio's overall listener satisfaction can be increased by offering a broader range of services.

Different strokes

Now consider that one of the fundamental trends to be distilled from our early observations of the new media age is "personalization."

Applying the above analysis to this lesson indicates that public radio may have more to gain from embracing new delivery methods for its core services than commercial radio does. Access to more service options generally benefits public radio, while it hinders commercial radio's efforts to amass aggregated audiences efficiently on a finite set of channels.

The cost of selling and acquiring content for any commercial audio service stream is nearly a fixed value, so there is no incentive to increase the number of such services that an operator delivers. On the other hand, if a public station can increase its net returns from increased listener satisfaction every time it adds to its suite of services, there is strong motivation to do so.

Public radio also is more adept at "living on the margins" and providing niche services to smaller audiences, which makes it better able to accommodate the far smaller audiences that new media services reach. In this respect, the new media environment favors the narrowcaster, and most public radio services have at least one foot in that camp. Their experience in providing "semi-personalized" services and serving small but demographically desirable audience will serve them well in the new media world.

Meanwhile, commercial radio may also find strong value in new media, but in different ways. This will likely take the form of collateral rather than primary service — i.e., promotionally supportive and "community building" services such as playlists, DJ profiles, photos, live control-room video, chat rooms, links to advertisers Web sites, etc., rather than core audio streams. Such divergence again speaks to the great flexibility of new media, but for different purposes than what radio delivers.

A mature and sensible synergy of on-air and online services, tuned to a particular business model, may therefore be the killer ap for radio broadcasters of tomorrow.

More about broadcast business models next time.

Skip Pizzi is contributing editor of Radio World.

MARKET PLACE

Electorack Forms Pro Broadcast And Broadband Group

Electrorack Enclosure Products said it has formed a Professional Broadcast and Broadband Group to offer custom and standard services for broadcasters.

The group is headed by Darryl Berman, the company's Atlanta-based regional sales manager. It will bring to market industry-specific products for large end-users and systems integrators.

The company's broadcast products are touted as offering substantial savings on installation. Its 22-inch-wide BR2 vertical rack systems meet structural seismic zone 4 design requirements of Section 1632 and the 1997 Uniform Building Code.

More information contact the company in California at (800) 433-6745 or visit www.electrorack.com.

Alpha-Core Expands Flat Magnet Wire Program

Alpha-Core Inc. now offers Flat Magnet Wire in sizes from 30 to 9 AWG, or 0.25 to 3.0 mm.

The company said its Flat Magnet Wire is more suitable than round magnet when compact coils and better heat dissipation are desirable. The wire is produced from round pre-insulated magnet wire, flattened utilizing a patent-pending process.

Applications include voice coils in speakers, motors and transformers. Five thickness-to-width ratios are available, from 1:2 to 1:4.

For information contact the company in Connecticut at (800) 836-5920 or visit www.alphacore.com.

Radio, When the Lights Went Out

by Scott Fybush

The stories of New York radio in the blackout of 1965 are legendary, such as WABC's Dan Ingram struggling with dimming lights and slowing turntables as he introduced "'Fly Me to the Moon,' in the key of 'R.'"

When the lights went out again on Aug. 14 this year, there were no turntables still spinning in New York radio studios, but plenty of adventure for engineers and programmers.

Generator-powered

At WOR(AM)'s studios on the 23rd floor of a Times Square office building, UPS systems kept lights and computers functioning until a rooftop generator kicked in. At the transmitter, Director of Engineering Tom Ray and Chief Engineer Kerry Richards had just finished their maintenance work and locked the building when they heard the transmitter go off. There, too, a generator quickly started up.

"We were off the air for about 20 seconds, total," Ray said, making WOR one of only a handful of New York stations that provided virtually uninterrupted service during the blackout.

Ray stayed at the transmitter site all evening and most of the next day, even going on the air at one point to answer questions about how WOR had kept broadcasting. Because WOR's office phone lines come through a fiber multiplexer that requires power to operate, Ray had to use the microwave link from the transmitter to communicate with the studios. At one point, he inadvertently found himself on the air giving out a private phone number at the transmitter.

"It immediately began ringing off the hook," Ray said.

Back at the studios, most of the station's staffers stayed the night, with morning host Ed Walsh walking up 23 flights of stairs to join them on Friday. Amid the adrenaline rush of providing information to worried New Yorkers, studio engineers managed to have a bit of fun in a darkened Times Square; one used a pocket flashlight to shine reflections off the windows of neighboring buildings that are usually brightly lit.

The magic of ISDN

For WCBS(FM) jock Pat St. John, the ISDN line he'd installed to service commercial voiceover clients allowed him to turn his home studio into a live broadcast studio.

The Infinity oldies station had studio power from a generator; its Empire State Building transmitter, like most of the stations there, went dark but was replaced quickly by an auxiliary transmitter atop the studio building. The hard part was getting air talent to the studios on the 40th floor.

"They could have put the station on auto-segue," St. John said, "but we had information to get out," and St. John's home in New Jersey still had power.

So Production Director Chris Angelo and Chief Engineer Bill Prendergast faxed program logs to St. John's home, 12 miles outside Manhattan. At 8 p.m., St. John took over from Bob Shannon and began what would turn out to be a nine-and-a-half-hour shift, live from his home studio.

"I was sitting here thinking, 'I can't believe I'm live from my house on CBS-FM,'" St. John said. "I have so much fun on the radio anyway, but to get to do this in this studio I'd built for myself ..."

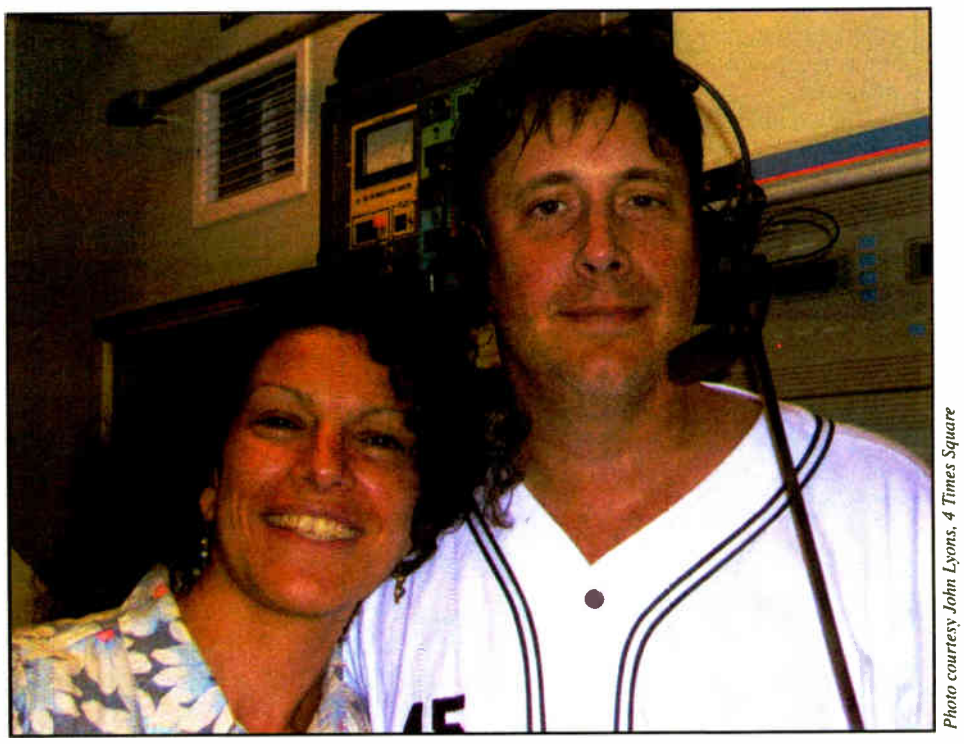


Photo courtesy John Lyons, 4 Times Square

Thanks to the blackout, WAXQ(FM)'s Maria Milito and Marc Coppola got an unexpected, working visit to the auxiliary transmitter site.

After his marathon overnight shift, St. John went back on the air Friday at noon to relieve morning man Dan Taylor, who'd climbed the 40 flights to the studios for an extended morning show. By 3 p.m, the power was back on at the studio and Shannon was able to do his show there, though he'd planned to broadcast from St. John's house if needed.

Other stations had a harder time with the blackout.

Without a generator, public broadcaster WFUV(FM) was in the same boat as millions of New Yorkers.

"The station took on this hollow, dark, quiet feeling," said Chief Engineer George Evans. "It's so strange to see a place that buzzes with life day and night, to be so quiet and dark."

A few staffers stayed the night at the Fordham University studios, sleeping on folding chairs while waiting for power to come back on, which it did about 8 o'clock Friday morning.

Clear Channel's five New York FMs immediately switched to their generator-powered backup site at Four Times Square and began simulcasting news from WNBC(TV). Several of the stations had no power at their studios, though, which led to WAXQ(FM) Program Director Bob Buchmann and his staff broadcasting from a makeshift studio in a corner of the auxiliary transmitter room, and urban WWPR(FM) borrowing a studio from top-40 WHTZ(FM) across the river in Jersey City, where generators were working.

(Of the other stations that use Four Times Square, public radio WNYC(FM) moved from its darkened downtown studios to the Sirius facility uptown, which was running on generators. Spanish Broadcasting System's WSKQ(FM) and WPAT(FM) brought in a feed from sister stations in Miami after they lost studio power.)

By Friday morning, the batteries had died on the T1 line WWPR was using to get its signal across the river, so WWPR and WHTZ ended up sharing the remaining microwave channel to Four Times Square and simulcasting an unusual morning show co-hosted by WWPR's Ed Lover and WHTZ's Elvis Duran.

That sort of cooperation doesn't happen by accident, said WHTZ Engineer George Marshall.

"Funny enough, this was all part of our disaster-preparedness meetings we'd been having (before the blackout)," he said.

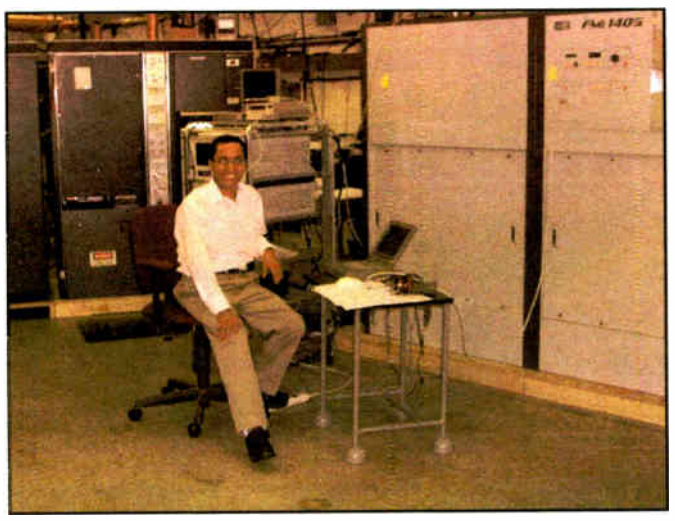
Scott Fybush lost power for nine hours in Rochester, N.Y., and was happily preoccupied scanning the dials until the lights came back on.

MARKET PLACE

Two Transmitters, Two Decades

Broadcast Electronics paused in the course of its usual business recently to note a glimpse into its own history.

"A vintage BE FM-30 and a new FMi-1405, BE's most powerful HD Radio transmitter to date, were sitting side-by-side in BE's final test area when it became apparent that they represent opposite ends of a 23-year span in Broadcast Electronics history," the company stated.



Mukunda Shrestha, BE's principal engineer, worked on both the FM-30 and FMi-1405.

"The FM-30 was the first transmitter model to be introduced by BE in 1980. The solid-state FMi-1405 is BE's recent and most advanced transmitter for digital HD Radio at 14 kW power output."

The older unit was in the shop in Quincy, Ill., to receive a factory upgrade for KTCZ(FM), which purchased the transmitter 15 years ago. The Fmi-1405 was being prepared for shipment to an HD Radio customer.

"Together, the transmitters represent more than two decades of radio transmission advancements: from tube to solid-state transmission, and from analog FM to HD Radio," the company said.

The FM-30 dates to BE's earliest days in RF products. It was the first transmitter to use the company's folded half-wave cavity design in the power amplifier section. The single-tube transmitter used an early solid-state IPA design. The company estimates that 130 FM-30s remain in operation

CMBE Offers Audemat-Aztec Rentals

REALcoverage.com, a division of CMBE Inc., has begun offering Audemat-Aztec test and measurement equipment on a rental basis to radio stations.

The service provides stations that want to monitor and document signal performance with a low-cost alternative to purchasing the equipment.

"Using portable high-speed data acquisition systems, stations can make quick measurement campaigns and analyze the data themselves, or use our mapping division at *www.REALcoverage.com* for more detailed studies," said CMBE President Chip Morgan.

The Audemat FM-MC4 rents for a week at a time and includes the equipment and software needed to measure the coverage of FM stations. Other Audemat-Aztec products are available for rental or for purchase.

For more information contact the company in Vermont at (802) 58-5000 or visit www.REALcoverage.com.

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Wednesday, October 1
Super Session

John Walsh
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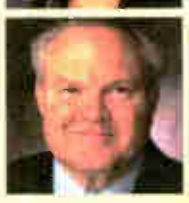
Thursday, October 2
FCC Breakfast

Commissioner
Kathleen Abernathy



Moderator
Bruce Reese
Bonneville Corporation

Sponsored by: A.G. Edwards INVESTMENTS SINCE 1887

Thursday, October 2
Keynote Address

Rush Limbaugh
Premiere Radio Networks

Sponsored by: RADIO HALL OF FAME

Thursday, October 2
Group Executive Session

Moderator
Sean Hannity
ABC Radio Networks

Group Executives Including:

John Hogan
Clear Channel Radio

Joel Hollander
Infinity Broadcasting

David Kennedy
Susquehanna Radio Corporation

Ginny Morris
Hubbard Radio

Mary Quass
NewRadio Group, LLC

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Thursday, October 2
NAB Marconi Radio Awards
Reception, Dinner & Show

Master of Ceremonies
Steve Harvey
Comedian & Host
KKBT-FM, Los Angeles
Syndicated by Radio One

MARCONI Radio AWARDS

Sponsored by: INTEREP

Friday, October 3
Congressional Breakfast

Moderator
Carl Gardner
Radio Journal Broadcast Group

Sponsored by: RBC Capital Markets

Friday, October 3
Radio Luncheon

NAB National Radio Award Recipient

Erica Farber
Radio & Records

Sponsored by: The Advantage of ASCAP

October / 1-3 / 2003
Pennsylvania Convention Center, Philadelphia

THE NAB RADIO SHOW

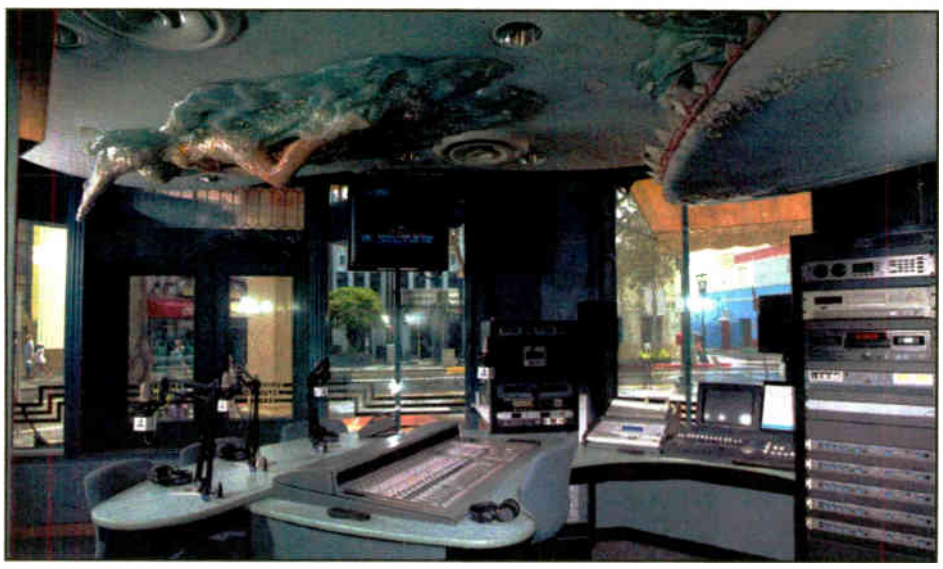
Focusrite
VoiceMaster
Pro Preamp
Mic Processor
see Page 38

Radio World — Resource for Radio On-Air, Production and Recording — September 10, 2003

Tips, Terms for Buying Cabinetry

by Ty Ford

Tearing a room apart to make it work better is a serious matter that requires full concentration, a good night's sleep and a fresh pot of coffee. The best results require planning, followed by revised planning and then, well, some more planning.



This radio studio with furniture by Harris Corp. is at Universal Studios, Orlando, Fla.

Photo courtesy of Robert Walsh

This control room furniture is installed at Gap Digital, a Wheaton, Ill., radio programming production complex designed by Walters-Storyk Design Group. To minimize reflections that may cause comb filtering at the mix position, no furniture installation is above 48 inches.

Upgrading or building out a new studio can go either way, or both. Surprises good and bad may await you, from finding old candy wrappers to the occasional Canadian five-dollar bill behind an old cabinet, or discovering that something is simply too big to move.

Facility upgrade

WTJU(FM) General Manager Chuck Taylor at the University of Virginia led two such projects in four years.

"The first project was an upgrade to an existing facility. We are a noncommercial studio and solicited this as a gratis project in exchange for underwriting. We paid for the supplies, the design work by a husband/wife architecture team at the University of Virginia where our studios are located was done in exchange for underwriting, and the cabinet construction was also gratis. The total value of the project in 1996 was $30,000 and it was beautifully done to retrofit an existing space."

Taylor says the 2000 project was a new $600,000 multi-room space. An outline can be seen at *http://wtju.radio.virginia.edu/studio/map.html.*

"I used a simple CAD program (VISIO Standard) to place everything down to data connects locations in each room within the existing space. I had my layouts of each space including racks and contents, pictures of equipment, etc. I gave my CAD drawings to a professional architect and he made them 'real world.' Amazingly, it came out exactly how I wanted it, which means the few stupid things I did came out exactly as planned too."

The *Buyer's Guide* section of the Sept. 1 issue of Radio World can help. Numerous vendors of studio design and furnishings were included there.

We spoke to several at random to ask how buyers can be better prepared when shopping around.

John Storyk of the Walters Storyk Design Group (*www.WSDG.com*) designs professional audio and video spaces for major companies around the globe. He echoes the importance of planning and programming in the design and layout of studio furniture.

"It's virtually impossible to have too much programming. If you cannot create scale drawings showing where every piece of equipment will reside, a scale mockup is the way to go."

In thinking about control room furniture and room ergonomics, Storyk suggests that most rooms fall into one of four types of layouts — each having its own type of furniture requirements: cockpit symmetrical; cockpit asymmetrical; railroad symmetrical; and railroad asymmetrical.

"Each of those four types can have any number of subsets. There is no right or wrong way to arrange equipment and create control room furniture. There are, however, tips to keep in mind and certain acoustic pitfalls that one should try to avoid," Storyk said.

He said a common mistake is to not take into account the shape and mass of studio furniture in calculating acoustic room response.

"Furniture and equipment with hard reflective surfaces have a drastic effect on the acoustic environment," Storyk said.

See CABINETRY, page 39 ▶

PRODUCT EVALUATION

A-T Music Mic Gets Radio Gig

by Andrew Roberts

Traditionally, tube microphones have been tethered to external power supplies with proprietary cables. These bulky but necessary appendages made a tube mic a less-convenient affair than its transistorized brethren.

Add to that the weighty price tag that often accompanies these transducers, and you have a real debate as to whether the sonic benefits outweigh the difficulties associated with their use.

With the introduction of the AT3060, Audio-Technica has taken the sting out of tube mic ownership and use. At $599 retail, including shockmount, this microphone is remarkably affordable. With its ability to run on phantom power, it has no cumbersome external power supply and related hard-to-find cables. The mic won the Radio World "Cool Stuff" Award this spring.

You would not likely put a tube mic in the on-air studio due to the level of abuse it might receive. Also, the fragility of the tube means potential failure under heavy

See AT, page 35 ▶

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Amarillo TX 800-537-1801
Fort Worth TX 888-839-7373
Seattle WA 800-735-7051

AT

▶ Continued from page 33

use. But if you seek a dedicated voiceover mic under controlled conditions or wish to air a live music performance on the morning show, the AT3060 merits consideration.

Features

The 3060 is a side-address cardioid condenser that is 6.71 inches long with a diameter of 2.05 inches. The satin silver chassis weighs 19.1 ounces and features a large doubled windscreen that allows ample access to the capsule.

Removing the windscreen reveals a gold vapor-deposited Mylar diaphragm that is two microns thick and 1 inch in diameter. The capsule assembly, at 1.5 inches, is the largest A-T has used.

Just below the capsule is a large plastic dome shielding it from a transformer. Below that is a Raytheon 6418 tube (about the size of a pen cap), horizontally situated through two shockmounted brass plates.

Even with its onboard electronics, the 3060 has a respectable noise level of 17 dB SPL (A-weighted). The frequency response plot of the 3060 reveals a gentle rise beginning around 1,500 Hz and peaking at 6 kHz. From about 10 kHz on up, there is a steady drop-off yielding an overall response of 50 Hz to 16 kHz.

In the studio

In my studio I used the 3060 on acoustic guitar, electric guitar and voice. I used the microphone on an acoustic guitar track for an upcoming release by the band Three Quarter Squeegee. Guitarist Mike Keiffer played my 1968 Gibson J45. The Gibson has a warm, rich sound that lacks significant high end. For this reason I was hesitant to use the 3060.

Tube mics, like tube guitar amps, are popular because they color the sound in a way that is pleasing to the ear. In my experience, they have traditionally generated a "warming" effect — a gentle reduction in brittle highs — on whatever was being recorded.

Therefore, combining a warm mic with a warm source like the J45 can result in an overly warm (muddy or boomy) track. That, however, was not the case with the 3060. Using only mic placement and no EQ, I was able to get an acoustic track that was rich and detailed with enough clarity to be heard amongst the din of drums, bass and electric guitars.

On the voice

On all sources, I found the 3060 to have a surprisingly present sound despite its tube nature and HF drop-off. In a spoken-word comparison it had a delicious sonic character, even when compared to mics that cost four times as much. The degree of clarity attained by the AT3060 also means less corrective EQ if the mic is plugged into a dedicated processor.

Later, I used the 3060 at a live sound gig where I had the opportunity to mix the legendary blues band Canned Heat. I put the 3060 on Stanley Behrens harmonica amp. After letting the 3060 warm up for the recommended 10 minutes before sound check, I placed it in front of his Fender amp. I am sure that if microphones could talk they would surely protest being placed in front of a harmonica amp — it's a harsh environment full of shrill frequencies, distortion and feedback howls.

AT3060

The 3060 took it all in stride as it delivered a true representation of the stage sound coming from Behrens' amp. With a max SPL rating of 134 dB, the 3060 handled the harmonica without noticeable distortion.

Analysis

Much has been said here regarding the AT3060 in live music applications, more so than voice. In a broadcast situation, this mic would shine when that touring band stops by the station to play a few acoustic tunes live on the air in advance of their concert. Condenser mics lack the inertia and perceived "heaviness" of dynamic units and predictably, the AT3060 provides plenty of clarity and transparency.

Again, the mic is a champ for voice work. The lift between 1.5 and 6 kHz gives shimmer to the soft-spoken female voice. Keep this one in the *good* production room for that all-important station imaging and for high-quality commercial work.

While it may not have the sonic coloration of classic tube microphones, the AT3060 has a rich, detailed sound that proved beneficial to almost everything I put it in front of. Without an external power supply, it is as easy to use as transistorized mics. All you need is phantom power and a few minutes for warmup. At $599, it represents an exceptional bargain. It will broaden your mic palette and it may become one of your favorites.

Andrew Roberts, a regular contributor to Radio World's sister publication, Pro Audio Review, is a sound reinforcement and recording engineer.

Tube mics, like tube guitar amps, are popular because they color the sound in a way that is pleasing to the ear.

Product Capsule:
Audio-Technica AT3060 Tube Microphone

Thumbs Up

✓Affordable price point
✓No cumbersome external power supply
✓17 dB SPL (A-weighted) noise level

Thumbs Down

✓May be too fragile for on-air studio use

Price: $599

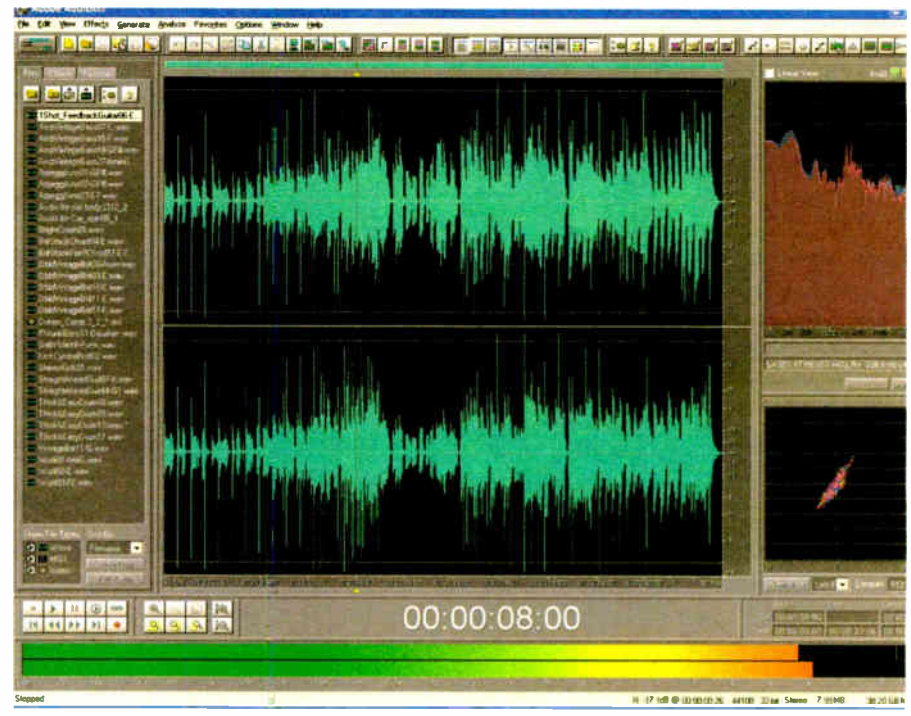
Contact Audio-Technica in Ohio at (330) 686-2600 or visit www.audio-technica.com.

PRODUCT GUIDE

Adobe Updates, Rebrands Cool Edit Pro

In May, Adobe Systems acquired Syntrillium Software and its assets, including Cool Edit Pro. As part of the acquisition, Cool Edit Pro has been upgraded and renamed; Cool Edit Pro users can download Adobe Audition at the Adobe Web site.

Adobe Audition includes the mixing, editing, mastering, effects and analysis tools from Cool Edit Pro 2.1. Thousands of royalty-free loops, including many from the Loopology Web site, are included in the software. Adobe video products have been integrated as well.



Owners of Cool Edit Pro 2.1 are eligible for a free upgrade to Adobe Audition, available since late August. Cool Edit Pro 1.x users can upgrade to Adobe Audition for $99.

For more information from Adobe, contact the company at (800) 833-6687, or go to www.adobe.com/audition.

Henry Seeks Match

The Henry Engineering DigiMatch 2x6 is an AES/EBU-to-S/PDIF interface and distribution amplifier for digital audio signals.

The unit can convert between professional (balanced) AES/EBU and consumer (unbalanced) S/PDIF digital audio signals. It distributes digital input signals to multiple destinations: AES/EBU input and three AES/EBU outputs, one S/PDIF input and three S/PDIF outputs. There are four modes of operation; either input can feed either or both sets of outputs.

Modes are selected using front-panel switches. The Convert mode essentially is a digital MatchBox, providing bidirectional conversion between AES/EBU and S/PDIF digital circuits, without altering any data in the bitstream.

DigiMatch occupies 1/3 of a rack width and can be mounted in an optional rack shelf or wall-mounted using optional wall/cabinet mounting brackets. Power is via an internal AC power supply.

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

WHO'S BUYING WHAT

Steven Klein Builds V/O Studio in Garage

Wayne Thomas Yorke wanted to branch out into voiceovers. The actor, who has appeared in TV spots for UPS/Mail Boxes Etc., Orkin Pest Control, Denny's restaurants and Liquid Plummer, contracted Steven Klein SCR to design and build a compact V/O booth in Yorke's garage.

Steven Klein SCR consulted and provided the specs, which included isolation, electrical, ventilation and installation of acoustical treatment. The specs called for a 7-inch deep absorber that fills the back wall, floor to ceiling. A 1-inch system is on the ceiling and upholstered walls hide the acoustic treatment.

Wayne Thomas Yorke in His New Studio

Looking Into The New Garage Studio

Steven Klein SCR also recently completed a musician's project studio for Damian Dragici, a Rumanian-born film score composer and music producer who wanted to convert a second-floor bedroom into a 350-square foot control room and tracking space. The project is two equal-volume connected areas with a windowed wall between. Sound-isolation materials, doors, windows and acoustical treatments were installed. Recording equipment in the studio includes a Digidesign Pro Tools HD DAW and Apple Emagic Logic software running on an Apple Macintosh G4, self-powered Genelec Model 1031 A control room monitors and subwoofer. A nearby loft houses a piano.

For more information from Steven Klein SCR, contact the company in California at (818) 788-1238 or visit www.soundcontrolroom.com.

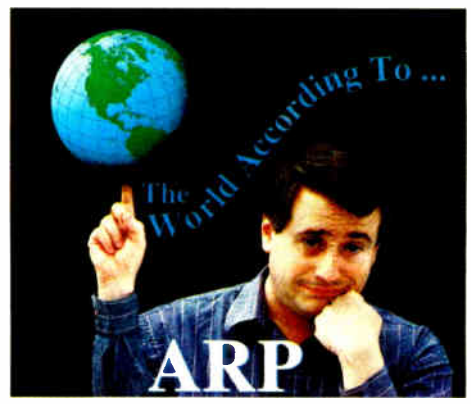
Small Speaker Has Numerous Applications

Remote Audio Products has developed a professional quality, self-powered speaker that uses a single 9V battery. The Speak Easy monitor delivers high fidelity sound with surprising loudness and long battery life.

The monitor is 4-inches by 4-1/2-inches by 6-1/2 inches and weighs 48 ounces. It is magnetically shielded and has a balanced XLR input connection for +4 dB and an unbalanced RCA input for -10 dB line levels. It has a volume control and an easily accessed battery drawer. An external power jack accepts power from 6-15 VDC. Applications include small stage announcements, field editing systems, field control rooms and video playback.

For more information, contact Remote Audio Products at (615) 256-3513 or go to www.remoteaudio.com.

Six Sigmas Signaling Senselessness



by Alan R. Peterson

My journey into these pages this time around was predicated by the return of Six Sigma into my immediate consciousness.

I recently pitched a memo that I found during a cleanup, which originally came from someone trying to idiot-proof the cable radio station I helped out about four years ago. And on my way to work these days, I always pass a Borders bookstore where the window display prominently shows off a pair of books on the Six Sigma process and how to apply it to one's own place of business.

Can it work in radio? *Has* it worked in radio? Perhaps it does so on its very own without the need for the explanation much less the application, but I am still not convinced.

I slept through that class

For the uninitiated (or those who simply have not cared up until now), Six Sigma is a methodology that is used to streamline and improve complicated business processes through prevention analysis.

out of 1 million opportunities for things to go right, only 3.4 flubs are allowed.

Gee, Mr. Science...

I am going to be oversimplifying this for a moment and leaving out a lot of detail. You may go back later and plug it in should you feel the need to do so.

Let us bust out our old 1973 Bowmar Brain calculators like we did for my hard drive article a few issues ago and apply this for a moment.

Say we have all our ducks in a row and all our Sigmas have been properly Sigmasized. We have only about three-and-a-half opportunities out of 1 million for things to go kaboom.

So let us say we have a DJ who is allowed to make 3.4 on-air mistakes out of 1 million opportunities before he is hitting the bricks for a new gig. How do we define that million? One million songs? One million seconds? One million shifts? One million words?

Forget the first. One million 4-minute songs works out to more than 7-1/2 years worth of continuous music, segued end-to-end and not counting leap years.

Eliminating these elements from the job at hand is like pulling the moon out of the sky with dental floss.

You know, sorta like when radio consultants tell you what not to do. Only this is valid.

The Greek letter Sigma looks like an "E" cut into rock by Fred Flintstone: Σ. In your high school statistics class, it was used to measure variation from the mean or average, or what was called standard deviation. And frankly it makes me yawn as much now as it did in high school.

According to the wonderfully informative Web site for DB Sigma of Ontario, "Sigma measures the process variation and can represent virtually anything: a component, a piece of material, a line of code, an administrative form, a time frame or a distance."

In industry this means the potential for a bad chip in a product, a flaw in a software package or a steering wheel that flies off in your hands. In our own case, a skipping CD, a jammed cart, copy that ended yesterday, an inebriated weekender that doesn't show up or a flood in the server room.

Back in the 1980s (you remember... *last century!*), Motorola came up with the foundations of Six Sigma while trying to improve the fabrication and function of its communications products. It was refined for business after some financial parallels were developed, andit was adopted successfully throughout the 1990s by General Electric and Allied Signal. Thanks to those efforts, we now have the finest toaster ovens and firehouse sirens made anywhere in the world.

Evidently, one level of Sigma is okey-dokey. But start refining it to six of the aggravating things and it boils down to this:

One million seconds is a little more reasonable but still impractical. That is around 278 hours, or just shy of 14 four-hour shifts, five days a week.

I won't even attempt a million words, but a million shifts are more fun to look at. Typically, a full-time air talent will do 250 shows per year, assuming five shifts per week, no remote broadcasts on weekends, no sick time and two weeks off for vacation. This poor air talent will have to work for 4,000 years without making those 3.4 screwups.

Let's not kill our batteries figuring it out for swing announcers and weekenders.

Fix it in the mix

Again according to DB Sigma, two expectations from applying Six Sigma are to "eliminate rework and stop firefighting."

You may as well cement the door shut to the production room and leave now.

I have been a production director for a number of stations since 1988 and I don't care if you make it *Twelve* Sigma; eliminating these elements from the job at hand is like pulling the moon out of the sky with dental floss.

Stomping out production fires on Monday mornings is as much a part of the biz as a modulation monitor. In spite of all best intentions that "Any spots starting Monday must be in to Continuity by Thursday 5 p.m.," there will always be those MP3s that arrive at midnight on Friday, long after everybody has gone home. There are always going to be late arrivals in the DGS receiver.

And there is always going to be one account exec to whom the rules do not apply, dropping an order into the bucket at 5:01 Friday afternoon for five scripts to be written and produced, then goes away for the weekend.

Savvy production directors build a time window into their Mondays to extinguish these brush fires. The first few months I went through this, I not only took it personally but resented the behind-the-scenes stupidity that kept on causing this.

Fortunately I realized the solution was not to apply any actual Sigmas to the situation consciously, but to tell frantic AEs that their demos and other material would not be ready until I tidied up the mess one of their own caused before the weekend. They got the message.

As for eliminating rework: can't happen. As long as there are clients who say, "Well, I like the spot, but her voice should go *up* when we give the price," there are going to be recuts. Six Sigma procedures catch flaws in the design, developmental and manufacturing phases of the entire process. It doesn't deal fully with carpet store owners who want their daughters to voice the script.

Thinking inside the box

Finally, the point where Murphy's Law meets Sammy Sigma head on: the audio storage system.

Inside this box, designed no doubt with Six Sigma in mind right from the drawing board, is where a station can be made or broken. Voice tracking follows the dictates of Six Sigma, inasmuch as a bad break can be zapped and rerecorded before it airs, all but guaranteeing a letter-perfect show. Flubs and mispronunciations are gone before anyone hears them.

Spots are scanned for a kill date. Anything that is out of tolerance is red-flagged and the system plugs in alternative audio to cover the avail. Music lengths are calculated and, if necessary, time-squeezed to avoid the dreaded sound of dumping out of a song early for news or some other event.

all the surge protectors and backup UPS units in the world aren't worth a plugged nickel when the power goes out for two days. Just how much fuel *is* in that generator tank?

Get real

Like I said, I am taking a hugely oversimplified (and admittedly frivolous) approach to what Six Sigma really is and does. There are likely many elements we can learn from and perhaps could actually apply. But the final word again has to come from DB Sigma, which states, "It is *not* another management system."

Far and away this will be the biggest reason why staff will rebel against it if instituted, because it will be applied by buzz-conscious managers as yet another "you-will-be-immediately-terminated" tool when things do not go right.

What has to be understood here is that the process is based on *prevention*, to analyze and find out the things that go splat early on and eliminate them. Too often, we work instead in a highly reactive mode, slapping Band-Aids on every problem that rolls down our way.

And things in radio will not go right. We are not manufacturing chips here. We are not drawing up Gantt charts on a daily basis for product launches. We cannot always be as predictive as we would like.

Yet I know from that memo I threw away that my old cable FM station was going to eliminate as much error as possible, based on a flawed notion: Six Sigma was little more than a fancy way of stomping out fires and keeping detailed records of it to see who was at fault.

Wrong. It is a proactive approach that

You may as well cement the door shut to the production room and leave now.

All pretty good, eh? Well, I've been through a few interesting three-point-four moments that made me take notice.

One station I was at ran long form programming from hard disk, which meant someone had to enter it at all times. One day a 28-minute show was not there, so the rig took over and filled with available material, which was nearly a half-hour of bumpers, PSAs and promos, none longer than 30 seconds and all played back to back. Can you imagine hearing that for any length of time?

The time-squeezing has to have a realistic ratio, otherwise things start getting wacky. Ever hear Celene Dion's "My Heart Will Go On" bumped way up in speed to hit the hour? It may as well be a bluegrass cut.

And as we found out earlier in August, everybody has to be behind in order to work. To that end, it may yet work in radio, but I haven't heard yet if it is.

For anyone interested in exploring what the methodology really is all about, I would start with a visit to *www.dbsigma.ca* or just do a Google search for Six Sigma.

If it helps your management style or gets your station to finally stop shooting itself in its foot, it's a start. But if you're going to do it, do it right.

Alan Peterson traded his Six Sigmas for a 7-Up, and implores you not to verify his math under threat of receiving a "geek check!" in your e-mail.

What unique business models have you applied at your station? Drop a note to radioworld@imaspub.com.

PRODUCT EVALUATION

Focusrite: Making Voices Tight

by Alan R. Peterson

There is no serious scarcity of microphone processors out there.

For example, one may choose a low-cost compressor/EQ/expander such as the $160 Behringer VX2000 or shoot big bucks on the $1,795 Omnia ToolVox. In between, there are the radio favorite Symetrix 528 and its digital sister, the 628.

Tube preamps are a valid choice, but radio has been trying to get *rid* of tubes for 40 years. And tube distortion on loud vocal bursts is not as romantic and nostalgic a sound as we think we remember.

So along comes Focusrite with the VoiceMaster Pro ($800 list price), offering up all the necessities like downward expansion, EQ, compression and de-essing. But the VoiceMaster Pro also throws in a bunch of digital capabilities and an instrument input, wrapped up in a knob-festooned rackmount unit sure to simultaneously confound and inspire.

I found some features on the VoiceMaster Pro out of place for broadcast mic processing. The device is intended for more-serious studio use, hence some special features like tube distortion and harmonics enhancement. But it has the features you need for making the production room mic sound like a million.

Just be warned — there are a lot of buttons and knobs on this baby, and *no* memory positions for recalling your favorite setting.

Hi, Mike!

First item you may notice is the mic input on the front panel. Every other processor made has the XLR input on the back.

Don't get ahead of me. There is also an XLR input on the rear panel as well. Some studio requirements dictate the ability to plug into the front.

The mic input features 48V phantom power, a phase reversal switch, an input gain pot and a variable low-cut rumble filter which dials in a nice steep -18 dB/octave shelf anywhere from 30 to 400 Hz.

The phantom power is a welcome feature. My evaluation mic for this review is a proto-type condenser mic from Lawson, targeted primarily to the voiceover performer and so new it didn't even have a model designation yet. Mics such as these require external power and the VoiceMaster Pro was there.

Musicians at the station might be pleased to know they can plug an electric guitar or bass into the unit without the need for an impedance converter or direct box. Part of my review explored that as well.

First stop: the Optical Expander. Basically a noise gate, it offers control over threshold and close (release) time. It's ideal for rooms with hissy HVAC or crummy acoustic seals to the outside world.

For all it does, I noticed some grittiness as the expander was closing. This was not as prominent on voice as it was when I played long sustained chords into it from a Danelectro electric guitar.

Next door to the right is the first feature to make me go, "Hah?" Vintage Harmonics, the manual claims, adds extra emphasis and sparkle to the signal path, much in the way we used to record cassettes with the Dolby button engaged, then play them back with the Dolby turned off.

This emphasis trick used to make tape demos sound shiny and full of life as they went out the door to a client.

Vintage Harmonics allows two frequency ranges to be affected: the mids, which peak at 3 kHz, and the highs, which top off at 18 kHz. Threshold controls set the amount of boost that takes place per band, dependent on level. When engaged and properly tuned, the result is a voice part that has a compressed feel but without the mushed high end normally experienced with conventional limiting.

One handy item here is the ability to place the Vintage Harmonics stage pre- or post-compressor. This way, you may choose to have the upcoming compression stage affect the pumped-up signal or not.

I said "hah?" to this feature only because most multiband processing such as this can be done post-production in the DAW. In live real-time use, the aforementioned Danelectro takes on a jangly '60s Byrds-type tone when this stage is engaged. For mics, the usefulness of this feature is best left up to your own needs.

More next door

Continuing to the right, we find the Optical Compressor, the magical component that turns our thready, raspy announcer voices into those of Norse gods. Every good mic processor has to have a compressor, and the VoiceMaster Pro does not disappoint.

It has the right features you need for making the production room mic sound like a million.

The controls are fairly simplified: Threshold, Release Time and Makeup Gain to restore what was dipped out during compression. A Hard Ratio button (known to dbx fans as "hard knee") tilts the compression response severely, turning lots of dynamics into almost none at all.

The Slow Attack button delays the onset of the compression action, leaving in some of the original attack and causing that *thup* effect with which we are familiar. When using a mic track with some reverb, that slow attack *thup* causes the reverb to bloom nicely.

This stage includes a pre-post button, placing the compressor before or after the upcoming EQ stage. With the interaction of the Vintage Harmonics' placement in the audio chain, this could get confusing.

By the way, you actually *can* insert reverb or whatever you wish prior to processing through the rest of the VoiceMaster Pro. Insert Send and Receive jacks on the rear panel tap the signal path after the mic preamp and before the first stage. Here you may patch in whatever external processor is desired.

The Tube Sound stage is another "hah?" item for me. It adds tube- or tape-type distortion, dropping in second- through fifth-order harmonics as the dials are turned. Musically, this stage did some good dirty work on the electric guitar I plugged in to the front, and the LED that gradually changed color from blue to red was a nice touch.

For the microphone though, my feelings were mixed. I like a clean, undistorted mic path all the way to the audio editor, where I can add in as much synthetic distortion as I want. I probably would not get a lot out of this particular stage for my own work.

Which does finally bring us around to the Voice Optimized EQ.

EQ 4 U 2

The VoiceMaster Pro lacks the wide sweeping EQ offered on units such as the Symetrix 528. But what it does have is claimed to be optimized for the human voice.

Instead of forcing us to memorize frequency bands and what they do for us, the VoiceMaster Pro uses subjective frequency ranges called Breath, Warmth, Mid and Absence.

The switchable Breath control offers nice boost and cut to frequencies above 10 kHz or 16 kHz (no doubt to freak out your dog). The Mid knob centers around 1.3 kHz to work the upper midrange of the human voice, and Warmth acts on lower frequencies from 120 to 600 Hz.

I like the Absence knob. At first, you wonder what is missing. Something must be missing if there is a control called Absence, right? What it does is drop a specific frequency range by up to -10 dB, centered around 3.9 kHz — a region that causes some harshness to the recorded voice. It's that range you've always noticed, but just couldn't find with the sweepable filter. Focusrite did the work for you. The Q is not variable on the Absence control, which is okay. Dial it all out and sort it out later inside the DAW.

Lastly, there is the de-esser, which affects overly sibilant sounds from 2.2 to 10 kHz. Very effective, especially when using a sensitive condenser mic that reads everything in the room.

And then there's that cool blue VU meter. You just have to see it in action.

Digits

The VoiceMaster Pro also has a 24-bit/96 kHz A-D option for $250. You can send a 24-bit signal directly into your digital console or workstation at 44.1, 48, 88.2 or 96 kHz sample rates. A Wordclock BNC connector allows the VoiceMaster Pro to be clocked by a house digital standard.

The unit I checked out shot a nice clean signal directly into my home Cool Edit machine via a Hercules soundcard with S/PDIF input.

If you want to minimize the amount of back-and-forth D/A and A/D conversions in your studio, this is a good place to start.

Of some limited use to radio production types is the latency-free monitoring section. This strives to eliminate the latency experienced when talent must perform to prerecorded tracks on a digital system and hears their own voice delayed in the headsets as it passes through the digital recorder.

Because we tend to record one item at a time and work out the synchronization on the editor, the latency issue is not much of an issue for radio production.

The wrap

The price and feature set of the VoiceMaster Pro make it a decent value and a good performer. It does what it was designed to do and offers lots of control over how you want your mic to sound.

It is priced a lot higher than the budget stuff you may have been eyeing, and it even checks in pricier than our old buddy, the Symetrix 528. One should remember that the Focusrite is a Class A device that costs more to make. Whether or not the extra features like the distortion stages are worth it for your operation are up to you.

That shiny aluminum front screams "look at me" when racked up along with the black-faced Denon and Tascam decks and Sony MD units; but a little pride cannot be all bad.

The Class A discrete preamp may run warm; indeed, the manual calls your attention to it. But what doesn't run warm in the studio rack? Leave enough space around the unit for airflow and all is well.

Please don't scream that the VoiceMaster Pro has no MIDI jacks and its parameters cannot be modified by MIDI commands. It is *radio*, we don't need that.

Last, a small nit: why a power switch? We generally leave components like this on all the time in the rack.

If you have the money, you are welcome to check out the unit's big brother, the Focusrite ISA220 Session Pack channel strip. That baby will set you back about $1,500, which makes the VoiceMaster Pro seem quite the bargain.

The VoiceMaster Pro

Product Capsule:
Focusrite VoiceMaster Pro Preamp and Mic Processor

Thumbs Up
- ✓Effective compression and EQ stages
- ✓Instrument input and double mic jacks
- ✓Optional digital 24-bit output up to 96 kHz
- ✓Insert jacks for ancillary processing

Thumbs Down
- ✓No memory for settings
- ✓Some features unnecessary for broadcast production

Price: $800

For more information contact Focusrite at Digidesign, its North American distributor, at (866) 362-8774 or visit www.focusrite.com.

Cabinetry

▶ Continued from page 33

"Try not to have anything higher than 40 inches. If you do, you are very likely to encounter comb filtering or other unwanted acoustic anomalies."

Use durable materials for all horizontal surfaces. Wood surfaces scratch easily and, while beautiful at first, can look old and badly worn a lot sooner than one might think.

At Mager Systems in Phoenix (*www.magersystems.com*), President Mager Kizziah is seeing a lot of studio construction that is the result of continued ownership consolidations. "We helped start the furniture revolution 25 years ago. We design, fabricate, deliver and install, nationwide. We can deliver pre-wired systems or let the customer do that for themselves."

Kizziah said the company is doing a lot of consolidation jobs, and several issues have become obvious. If you're planning a large facility with 30 rooms, 12 production studios and 10 on-air studios, a savings of 25 to 30 percent can be realized by making the footprint the same for all rooms that share the same or similar functions. It is about economy of scale. "Footprint the room and duplicate it," he said.

Economy of scale

He has attracted new customers with the Sound Choice stock line of furniture. A trip to his Web site lets interested parties see furniture and layout diagrams from different perspectives and elevations to aid in the selection process (*www.magersystems.com/soundchoice line*).

Kizziah says he is is particular about the materials he uses and how well the pieces are made.

"If you are not in it for the long haul, buy it cheap and replace it when it breaks. Not many people talk about warranties. We give a 10-year warranty on all solid-surface tops, the structure of the cabinets and delamination." Kizziah argues that delamination can occur in inhospitable climates, even as early on as during shipment to the client.

"If a transport truck travels across a hot area, internal temperatures can reach 180-200 degrees Fahrenheit. Fifty percent of the glue joints on some cabinetry won't take that, and the furniture will fall apart prematurely or the laminated surfaces will come off."

Kizziah says most grades of the furniture looks the same on the outside, at least at first. "The real truth, however, is not easy to find. There are so many different qualities of particleboard. All plywood is not created equal. The screw-holding power of a substance is important, because while the piece may be cheaper, the screws won't hold and it will fall apart. We use 13-Ply Finland Birch Plywood and engineered lumber only — no particleboard — along with our exclusive construction techniques."

Within that scope, Kizziah offers a variety of materials from standard laminates and wood to solid surfaces.

At Harris, Rich Redmond is director of broadcast systems. Deciding the workflow requirement drives the decisions.

He begins each project with a one-page checklist. Redmond asks himself many questions: Is this an air studio, a production studio or a combination production studio/production director's office? How many mic controls, headphone controls, cough panels and other systems will there be?

Which pieces of equipment will need to be in view of the operator, which can be less visible? Will multiple computer and audio monitors be used? Are the speakers centered in one place or are two sets required to provide proper monitoring for two different kinds of work. Where are the computers?

Cabinets housing powered equipment need to be designed to allow for convection cooling. Local fans make too much noise. In fact, Redmond says it is far better to mount all of the computers in a central, cooled machine room, running remote cabling to monitors, keyboards and computer mice.

"Doing it this way cuts down on noise and heat and also cuts down the price of the cabinetry, which does not have to be configured to house computers. It also opens up the room, making it more spacious," Redmond said.

According to Redmond, the traditional U- or L-shaped designs with equipment both above and below have given way to newer designs in which a single computer replaces the function of many pieces of equipment allowing them to create a more open architecture with cable passageways connected to the counter top.

The new talk studios of KKLA(FM) in Los Angeles show curves, solid surface and thermal forming of solid surfaces by Mager Systems.

"Knee space is very important, especially in a multifunction design. Primary or secondary positions at the same chair site with comfortable knee space for both positions need to be factored in."

Curves are in

Redmond says Harris uses CAD software to create its designs. The company also has a CNC router capable of cutting angles and curves much more quickly, precisely and cost-effectively than relying on hand-cut surfaces. What would take an hour in the Harris system might take 30 hours of manual work. A vacuum-assisted manufacturing table holds the wood in place while a computer-controlled router cuts custom shapes.

Saga Communication, in Keene, N.H., had a small budget, but even with their cost restrictions Redmond found he could give them a much better look with this system. "This change in the manufacturing processes has allowed us to bring custom, high-end major market work to everyone."

According to Redmond, today's new high-pressure laminates are far more resilient than those available five years ago.

"Square corners get knocked because they stick out. That creates a maintenance problem. Over time oak trim requires a sandpaper and lacquer touch up. Now we use plastic and polymer trim that can take the impact. You can clean it up with any surface cleaner, such as Windex or Fantastik," Redmond said.

Radio studios designed today obviously benefit from advances in technology that have happened over the last 10 years. As clunky cabinets and sand-filled turntable bases become a thing of the past, it will be interesting to see where between the Flintstones and Jetsons the current industry trends will wander.

You can access Ty Ford's Web site at www.jagunet.com/~tford.

Glossary

Here are some common terms you might hear when shopping for cabinetry.

Balancing: Laminating both sides of a substrate (doors, tops, panels) to prevent warping.

Delamination: Breakdown or poor adhesion that causes laminate to peel, crack or chip from substrate.

Engineered Lumber: Solid wood that is glued in linear layers; it is stronger and more stable than solid wood.

Laminates: Top/final layer of furniture tops and sides; available in a variety of styles and finishes for every design style. Durable laminates are fairly scratch resistant and able to endure an everyday studio environment and wear and tear.

Melamine: Particleboard covered with a single sheet of paper impregnated with plastic resins intended for light-duty application.

Scribe: Cut top or cabinet to match irregularity in walls or floor.

Sight Lines: Furniture design and layout should be designed to maximize line of sight or view of the studio(s) for talent, producer or engineer. A working environment and productivity can be compromised with furniture blocking a view.

Solid Surface: Nonporous homogeneous blend of polyester or acrylic alloys and fillers, used for tops and other applications.

Technical Ergonomics: In design process, keeping in mind angles to set above-rack equipment, audio board setback, keyboard placement and all other peripherals (like Instant Replay, turntable and telephones) so that everything is in easy reach of the studio operator.

Thermalforming: Heating solid surface to bend into curves and shapes.

Venting: Designing and installing furniture with natural air flow in mind so that equipment is spaced effectively. Properly placed vents/openings eliminate the need for most insulated cabinets with cooling fans.

PRODUCT GUIDE

Seven Woods Reissues Reverb

Seven Woods Audio is going into space by going back in time.

It announced the SST-206 Space Station, a reissue of its Ursa Major Space Station reverb and effects unit designed in 1977. The Space Station now is updated using 24-bit DSP to replicate the original's sound.

The SST-206 is about the size of a paperback book and can be held in one hand during operation. Christopher Moore, Seven Wood's president and designer of the Space Station, shrank it from its original 3RU size. The SST-206 fits in what appears to be its remote control.

"The remote is the reverb," Moore said. "Users have access to every reverb control from the sweet spot at the console."

The Space Station is based on a 150-MHz, 24-bit Motorola chip, provides AES/EBU digital I/O and accepts 24-bit audio at 48 or 44.1 kHz. Power is from an external supply built into the breakout cable.

Moore decided to update the unit because of interest on Internet studio equipment lists and activity on eBay. Although he said he retained the "garage grunge" sound of the original, he added a reverb program called "room." It is controlled by 12 potentiometers that provide access to important parameters. The company says it recalls a time before multilevel menu structures took over. There is no need for an LCD or user presets.

Price: $1,195.

For more information contact the company in Massachusetts at (617) 489-6292 or visit www.sevenwoodsaudio.com.

SST-206 Space Station

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6-bay FM antenna, some lightning damage, BO. Bob Zellmer, New Directions Media, 27610 N Desierto Dr, Rio Verde AZ 85263. 480-471-3533.

ERI FM isocoupler, 20KW, like new, 97.9 MHz, 3" EIA flange/pipe mount, FOB Dallas, $1000/BO. Hue Beavers, KCIF-KPLX, 3500 Maple Ave, #1600, Dallas TX 75219. 214-520-4386.

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RCA Dielectric BFC-4B FM 4 bay antenna, 97.1 MHz, removed from service 1998, FOB Dallas, $500/BO. Hue Beavers, KCIF-KPLX, 3500 Maple Ave, #1600, Dallas TX 75219. 214-520-4386.

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Orban 8100, just removed from service, re-capped 2000, $2000. Tom Taggart, WRRR, POB 374, St Marys WV 26770. 740-541-0216 or tpt@eureka.net.

Texar Audio Prisms (2) with #5 Texar card, $800/both. Ron Witt/Bob Spencer, WSTG, POB 5588, Princeton WV 24740. 304-425-2151.

Valley Audio 400 mic processor recently brought up to full factory spec by the manufacturer. $475. Paul Trembley, Downtown Sound Prod, 23915 Via Rosa Linda, Valencia CA 91355. 661-254-5213.

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Sparta Bauer, 25 KW FM transmitter, BO. Bob Zellmer, New Directions Media, 27610 N Desierto Dr, Rio Verde AZ 85263. 480-471-3533.

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Used lower power AM transmitter in good working order. Michael Cardillo, 151 Morgan St., Cranston RI 02920. 401-942-8341 after 6PM EST.

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ACTION-GRAM

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◆ READER'S FORUM ◆

Radio World, September 10, 2003

Engineers and Lyme

Thank you for the fine article on Lyme Disease in the Aug. 1 issue. Doug Fearn did a great job and covered a lot of ground in this article.

I, too, have this affliction and appreciate the significant risk possible to anyone who spends time outdoors. Your readers are well-served by this information. I hope they study it carefully.

I must reinforce my opinion that if you suspect Lyme Disease and feel that your doctor is not taking your concern seriously, find another doctor. Even in the East where Lyme Disease is common, many doctors are not familiar enough with this disease to make the clinical diagnosis and perform adequate treatment. Because tests are not very useful, only the best clinicians are equipped to deal with Lyme patients.

Rolf Taylor
Applications Engineer
Telos Systems
Cleveland

Galvanizing AM

I have been following the ongoing discussion about the future of AM radio in the pages of Radio World. IBOC promises to drive the final nail into AM's coffin due to the constricted analog portion of the signal's lifeless muddy sound, while the "hash" of the digital sidebands totally trashes reception of stations on adjacent frequencies.

Even if IBOC is scrapped in favor of the proposed Kahn system, AM is on a self-destructive course that no pie-in-the-sky technology can ever reverse.

Tuning across the AM band on Saturday mornings and weekday evenings, when I do most of my radio listening, I find a cesspool of infomercials by charlatans peddling quack medical devices, phony dietary supplements promising to do everything from preventing cancer to enhancing sexual prowess and dubious financial advice.

I also hear a lot of "dollar-a-holler" brokered programming in every language except English, and quite a bit of traditional "hellfire and brimstone" preaching.

While the lure of easy money provided by such programming is hard to resist, it certainly does nothing to draw listeners back to the AM band. Even if IBOC catches on, would you spend the money on an expensive new radio just to hear this garbage?

Meanwhile, some of our largest cities have musical format holes waiting to be filled by an imaginative AM broadcaster. New York totally lacks adult standards/big-band music, country (there is no country station within 60 miles of New York City), traditional R&B and pre-British Invasion oldies. Philadelphia has a standards station and country station, but lacks full-time outlets for classical, jazz and pre-British Invasion oldies.

Yes, these formats all skew toward the older listener. But older listeners are more likely to listen to AM, especially if an AM station provides something that is unavailable on FM. It just takes a bit of work by the sales staff to sell that demographic.

The AM broadcasters are their own worst enemy.

Philip E. Galasso
Independent Broadcast Engineer
West Creek, N.J.

Why Settle for Adequate Specs?

After reading Jim Trapani's *Guest Commentary* ("Cost Vs. Specs," May 21), I can't understand why any of us have upgraded FM transmitting equipment at all since the 1960s. I walked away from this article flabbergasted that someone would actually suggest that purchasing equipment with specs beyond what the FCC mandates is unnecessary.

Would I go back to the old RCA tube exciter that passed FCC specs from the 1960s? Not just no; *hell*, no. Would I go back to the Harris MS-15 exciter? It was a gem in its heyday but is antiquated by today's standards. I'd have to answer no to that, too.

Broadcasting is a chain from source to receiver; the chain is only as strong as its weakest link. Having the best possible specs on each piece of the chain helps ensure that the signal throughout the entire chain remains clean.

While many of the average receivers have limited signal-to-noise ratios, I don't want to be the source of noise on the few high-quality receivers out there, or any receiver, for that matter. Also, many of the degrading factors in the air signal are cumulative.

As good as FM was in the early years, it has remained in a constant state of improvement and far exceeds the original FCC spec limits. The improvement can be attributed to many things, including digital sources for the music (CDs and digital audio storage systems), high-quality audio consoles (both analog and digital), improved STL links (T1s and digital 950 links) and vast improvements in transmitter technologies (including folded-wave RF cavities and high-performance exciters).

Many agree that the performance of the current FM chain makes the transition to HD Radio a moot point, but that is another issue entirely.

Every broadcaster has a budget, whether it's the inadequate budget of a small, stand-alone station or the seemingly infinite budget of the largest chains. And like any consumer, we all want the best bang for our buck.

My advice is to buy the best equipment your budget will allow. Few people regret buying a better model than they intended, while many will tell you they wish they had done so. All of the major manufacturers are building some damn fine equipment right now. Shop wisely and you'll make a good decision.

Give your listeners the best signal you can broadcast. They'll appreciate it.

John Arndt, BSEE, CPBE, CBNT
Assistant Chief Engineer
Greater Media's
Philadelphia Radio Group
Philadelphia

People are expected to pay five times as much to attend (the Radio Show). It makes no sense that an organization thinks they can increase attendance at its conferences by jacking up the cost.
— Mike Stosich

Members Only?

I am with a major automobile radio manufacturer and had hoped to attend the fall NAB Radio Show to obtain first-hand knowledge about where things are going in this industry. We must make decisions about IBOC, satellite and even RDS. Conferences on antenna impedances are of little value to our business.

However when I received the NAB mailing, all I could find was "Full Conference" registration. Because we merely make the radios that NAB members must have in order to exist, we cannot become members. Therefore, our cost would be an exorbitant $795.

Compare this to the previous cost of about $125. Better yet, compare this to the surprise "Complimentary" exhibits pass I received about two months prior to the spring NAB show in Las Vegas. Had I received this pass early enough to make travel arrangements, I might have gone. I now wonder whether or not I will receive a complimentary pass two weeks prior to Oct. 1.

I attended the Seattle NAB Radio Show last fall. I, and others, commented on the poor attendance. Having said that, I was surprised to receive the latest conference literature. People are expected to pay five times as much to attend. It makes no sense that an organization thinks they can increase attendance at its conferences by jacking up the cost.

So I phoned the NAB registration number and was told that there was only one way to register: pay the whole $795. Believing that there had to be an internal mistake, I e-mailed the NAB but received the same response.

Recently, a fellow formerly with the EIA happened to mention to me that the NAB had changed their minds due to complaints and initiated an exhibits-only registration. I went to the NAB Web site and found something about a complimentary exhibits-only registration.

I attempted to use it, but was asked for a code number at the end. Examination of the site revealed that code numbers must be obtained from exhibitors.

I then phoned an exhibitor from last year's show and they gave me their secret code number. I went to the NAB site and registered for exhibits-only credentials. The cost came up $0.00!

Last year, the registration fees kept the NAB show from making many tens of thousands of dollars on attendees to the exhibits-only events. This year, they scared away many potential attendees and lost thousands of dollars' worth of credentials. I am sure that the exhibitors who paid good money to attend must be very unhappy.

Mike Stosich
Downers Grove, Ill.

How to Submit Letters

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

Letters should be 100 to 300 words long; the shorter the letter, the better chance it will be published in full. We reserve the right to edit material for space. Longer commentaries are welcome but may not reach print as quickly.

Include your name, address and contact information, as well as your job title and company if appropriate.

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.

◆READER'S FORUM◆

Walden Foundation

Thanks to Paul McLane for his comments regarding Glynn Walden ("Walden Will Be Missed — And How," Aug. 13). It is comforting to see someone who can express to a wide audience the same feelings I have.

I was privileged to be part of a subcontractor team in Cincinnati that pioneered AM DAB in the early 1990s. At that time it was called Acorn DAB and indeed there is still an Acorn decal on the side of the test van sitting in our side lot.

There were often several radio heavies in the lab back then, but none stood out like Glynn. Everything you say about him in your recent article became evident to us. He was never too busy to stop and talk with someone during a show, or "too important" to mix with the engineers and learn something new. His energy level and love for AM was amazing — and catchy.

As for Glynn, I know something positive is around the corner. We will be seeing and hearing much more from him in the very near future.

Great job.

John G. Marino
Vice President, Science & Technology
National Association of Broadcasters
Washington

Ibiquity and IBOC

My attention was drawn to a recent article stating that the standard-setting activity for IBOC had been temporarily suspended by the steering committee of the National Radio Systems Committee's DAB subgroup. This declaration was made in light of concerns about Ibiquity's low-bit-rate PAC compression algorithm.

These concerns were made public following a recent demonstration at NPR where several NRSC sources said they found the artifacts on the system using PAC unacceptable.

Two possible options were offered to address Ibiquity's IBOC problem. The first was "tweaking" the PAC algorithm. The second involved reverting to another coding algorithm such as AAC or MPEG. All three algorithms are based on psycho-acoustic principles.

It has been well-documented in the past 10 years that the number of destructive psycho-acoustic-based algorithms in the audio broadcast chain could, in theory, introduce artifacts. It is arguable that the use of PAC as the final emission for IBOC is simply highlighting this problem.

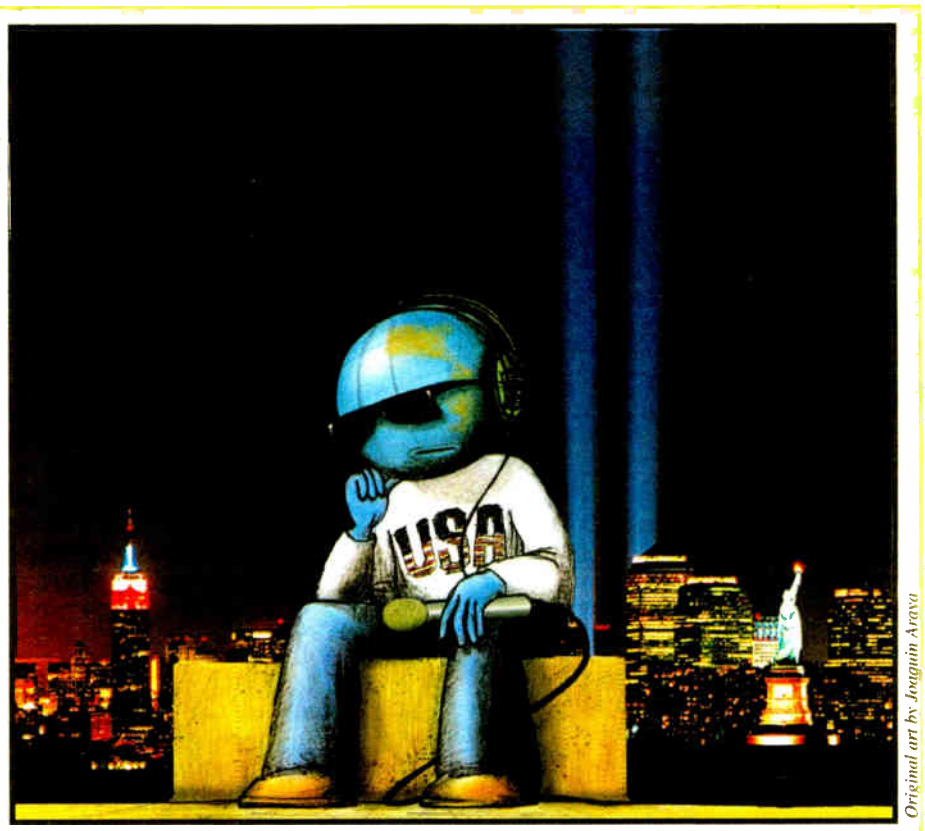
Using other psych-acoustic-based compression algorithms, i.e. AAC or MPEG, may marginally alleviate the artifacts, but would only offer an incremental improvement. This approach is not actually addressing the true problem and is simply attempting to "paper over the issue."

To fundamentally address the issue, we at APT-Audio Processing Technology have been recommending that broadcasters take better care of their content. We suggest a reduction in the number of psycho-acoustic passes in the broadcast chain. Where compression is required, use a relatively gentler, non-destructive ADPCM compression algorithm, i.e. apt-X.

Until broadcasters take ownership of the problem, the artifacts in audio emitted via IBOC will remain. The only point of contention will be how noticeable they are to the listener.

Add this to theories introduced by multiple psycho-acoustic passes on "listener fatigue" and its relation to artifacts, and the broadcasters run the risk of having an extremely poor return on their capital expenditure of their IBOC network.

Jon McClintock
Commercial Director, APT
Belfast, Northern Ireland



Original art by Joaquin Araya

Never Forget

AM in general, and AM DAB for certain, is where it is today because of one man: Glynn.

— Steve Meng

I have told people for years that AM in general, and AM DAB for certain, is where it is today because of one man: Glynn.

Like you, we here were shocked and very sad to learn of Glynn's release from the project and have the same questions about the whole thing that you do.

Steve Meng
Design Engineer
Cincinnati

Paul McLane wrote a good piece about Glynn Walden in the Aug. 13 edition.

Glynn and I have been friends for a long time, and I was totally shocked to hear from him what had happened. Since Glynn was so well-respected and visible in the radio industry, I wonder how this move by Ibiquity may affect a broadcaster's opinion of this company.

Free Play's Wild Ride

We promised in an earlier review ("Wind-up Grundig Is Affordable," March 12) to update readers on the Free Play Radio sent to Ghana and its recipient, Chris Kusek, who has since completed his Peace Corps assignment.

Just before Chris's Peace Corps economic project wrapped, a grant from a Dutch medical charity enabled the construction of a new health clinic in his outback village. The Peace Corps assigned a volunteer specialist to the staff who will focus on HIV/AIDS prevention and treatment. The Free Play radio was given to one of the nurses at the clinic.

Chris reports that the electric power situation in the village has improved. The interval between a power outage and restoration has decreased from three months to a couple of days.

This is definitely a location for a Free Play radio. The nurses in the new facility now have a reliable window on the outside world.

Chris is back home in Philadelphia, teaching until the fall when he begins pursuit of his graduate degree in special education.

Charles S. Fitch
Avon, Conn.

More Opinion On Page 45

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Once configured, the system operates entirely independently of external computers. Configuration itself is intuitive and carried out onsite by means of user-friendly graphic interfaces provided by Wheatstone desktop software. We have gone to great lengths to make these setups easy for your field engineers, allowing expansions and changes to be achieved painlessly. Naturally, the Generation 9 system also takes full advantage of Wheatstone's exclusive VDIP® configuration software as well, so that studio functions (like mutes, fader and timer starts, tallies, etc.) are easily accomplished right at your desktop. Once set-up is completed the desktop is disconnected; all settings are retained in nonvolatile storage and the entire system runs standalone. Ethernet protocol is built in, providing interface with automation, scheduling, and hardware controllers as you require.

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