'COOL STUFF' AWARDS ISSUE

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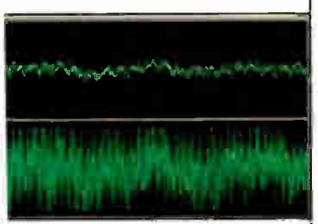
INSIDE



Hard-Disk Lawsuit Threatens Stations

But 'Prior Art' Exists, According to Automation Industry Executives

BY RANDY J. STINE

WILMINGTON, DEL. — Radio broadcasters are preparing for a long legal battle over the automation technology that has become the backbone of many of their stations.

Mission Abstract Data LLC, doing business as DigiMedia, has filed a complaint in United States District Court for the District of Delaware alleging patent infringement by CBS Radio, Beasley Broadcasting, Cox Radio, Greater Media, Cumulus, Entercom and Townsquare Media. In all, more than 900 radio stations are involved.

Industry observers contend that automation systems were well established before the first of the patents was applied for in 1994 and issued in 1997; and at least two broadcasters named as defendants are denying the validity and basis of the claims.

"The plaintiff claims it holds two U.S. patents that relate generally to a method and system for operating radio stations wherein a digital database stores music that is programmed, played and broadcast by the radio stations," Mission Abstract Data states in the lawsuit.

The company is asking for a jury trial to determine damages, plus interest, for infringement of the patents. The suit was filed on behalf of Mission Abstract Data by Hagens Berman Sobol Shapiro LLP. No trial date had been scheduled as of early May.

A patent abstract describes in part "a digital radio broadcast station which includes a common digital database having stored therein a plurality of several hundred selections of music to be played and broadcast." According to court documents, the Mission Abstract Data music storage patents relate generally to a "system for operating radio stations wherein a digital database stores music that is programmed, played and broadcast."

Several sources confirmed that some defendants and automation vendors held a conference call to review a possible defense strategy.

Some broadcasters meanwhile have been contacted by parties representing Mission Abstract Data asking them to sign and pay for licensing agreements.

Based on comments to Radio World, the patents were the topic of intense

(continued on page 6)

Take the "Cool Stuff" Tour!

Exciting new products that earned the Radio World "Cool Stuff" Award are featured throughout this issue.

Mark Seigle, left, and David Day in the DaySequerra booth. Photo by Jim Peck

E-6

The flagship of our E-Series consoles, the E-6 does it all. Its intuitive interface gives you all the power you need for an on-air or production studio.

SIDEBOARD

Perfect for newsrooms, guest talent, interviews, the SIDEBOARD's tiny footprint lets you put it exactly where you need it.

E-1

With its small footprint, the E-1 can be a self-contained console when paired with our ip88cb Console Audio BLADE. It also becomes a full function station on our WheatNet-IP AoIP Network.

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Let's face it, your console IS your desktop. Wouldn't it make sense to use one that knows how you work and makes your job not only easier and faster, but better in every way?

Wheatstone's **E-6**, **E-1** and **Sideboard** control surface consoles do just that. They're intelligent with virtually limitless routing capabilities, letting you control what's around you as well as sources in other studios. These are pure "RADIO" inside and out – not someone's glorified idea of what a starship helm should look like – so you're immediately at home with their form and function.

Featuring an intuitive layout that never leaves you guessing, as well as smart control over on-screen functions, these are truly world class consoles, right down to the feel and reliability of real P+G faders.

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Download the FREE white paper "The Technical Case for the Intelligent Network" at WheatIP.com

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Harris Broadcast Communications
Flexiva Air-Cooled FM Solid-State Transmitter

This air-cooled VHF FM solid-state box is a single platform that supports analog and global digital radio standards.

"Quad-mode operation supports FM, FM+HD Radio, HD Radio-only or DRM+ digital broadcasting, while the transmitter incorporates Harris Real-Time Adaptive Correction (RTAC) technology to optimize power and minimize adjacent-channel interference," the company states.

Harris talks up the transmitter's power efficiency and very high power density thanks to PowerSmart technology.

The company's Rich Redmond said in the announcement, "Harris is investing in new transmitters and HD Radio broadcast infrastructure to help broadcasters deliver content more efficiently."

Flexiva comes in power levels up to 20 kW. In the booth: Geoff Mendenhall and Rich Redmond are shown.

Info: www.broadcast.harris.com

COOL STUFF AWARD RADIOWORLD 2011

RCS
Zetta

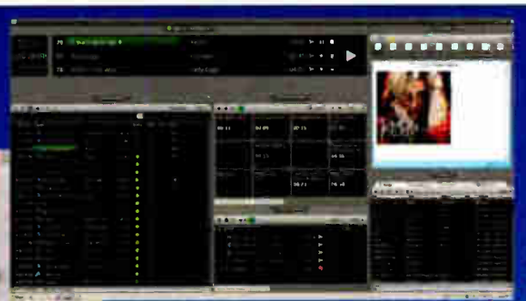


Photo by Jim Peck

"Reliable, intuitive and flexible" are goals RCS had for Zetta; the company said it sought to make its new radio automation system as reliable as its NexGen Digital products and as sophisticated as Master Control. In fact, "If someone was to accidentally close the program, your radio station would keep on playing," the RCS website promises.

Zetta integrates with music scheduler GSelector, RCSnews and traffic system Aquira. Durability and sleek design are among its selling points. Zetta is written using Microsoft .NET technologies, developed on C#, WPF, WCF and SQL Server to enable flexibility for future expansion.

Staid as usual, President/CEO Philippe Generali mugs for our photographer.

Info: www.rcsworks.com/zetta

This Calculator Is 'Cool Stuff'

FASTROAD Introduces a Tool to Help You Do Efficiency Comparisons

You'll find winners of Radio World's prestigious "Cool Stuff" Awards throughout this issue. They were selected by a panel of anonymous, experienced radio engineers as notable for their design, features, cost efficiency and performance in serving broadcast users.

One winner that I want to explain in a little more detail is the Transmitter Efficiency Calculator.

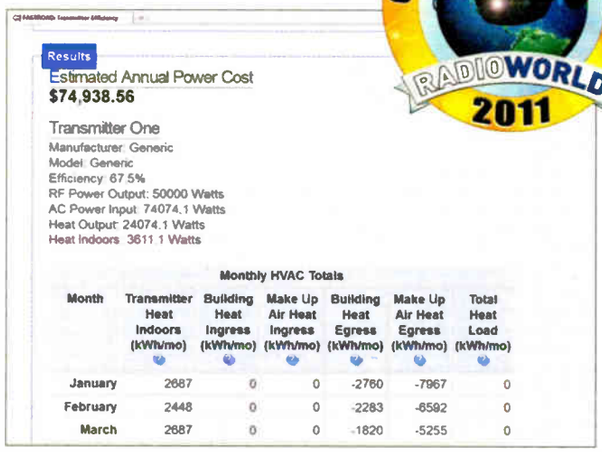
This online tool was developed by the engineering consulting firm Cavell, Mertz & Associates, and was funded and introduced by FASTROAD, the technology advocacy program at NAB.

The calculator lets you predict approximate transmitter system energy costs. You answer a series of questions relating to your transmitter configuration, geographical location, the building structure in which the equipment is housed and on-site cooling capabilities to come up with an approximation of system efficiency.

What a great idea. The developers note that the purchase of a transmitter is among the most important tech decisions you can make, particularly given escalating energy costs and improvements in high-efficiency amplifier designs.

"In some cases," the website notes, "the purchase of an energy-efficient transmitter may even pay for itself over time, particularly if care is taken to design as energy-efficient a transmission system as possible."

The calculator lets you plug in the measured efficiency of your current transmitter, if you have it, or the efficiency specs from the manufacturer or the published efficiencies of planned new transmitters. The calculator then spits out estimated power consumption and cost estimates in dollars. The tool also can predict overall efficiency of typical installation configurations with consideration given to your local climate, energy costs, HVAC and other factors.



Results from the calculator — which grew out of a Cavell, Mertz & Associates white paper about power-efficient broadcast facility transmission design — are influenced by several assumptions the developers had to make. But NAB engineers say its outcomes should allow you to perform "what if" comparisons when considering various transmitters and scenarios.

CAVEAT CALCULATOR

I thought it was nifty. I asked two transmitter manufacturing veterans for comment about the idea of an online efficiency calculator. I found them supportive, if cautious.

Geoff Mendenhall, vice president of transmission research and technology at Harris Broadcast, told me he thinks the efficiency calculator is "a great idea" and said Harris provided data for the project.

But he emphasized that measurement methods behind such tools need to be "standardized, repeatable and highly accurate." He told me that in an early look at the website, he saw some results he just didn't believe.

"I saw one bar for over 80 percent on an FM analog transmitter. That's not possible unless they have Kryptonite," given that a reasonable top power amplifier efficiency is 85 percent, a number that would come down significantly once exciter, cooling system and other factors are added in.

FROM THE EDITOR

Paul McLane

Mendenhall also gave a general thumbs up to the efficiency white paper, calling it a good document. (That paper included a primer on power-efficient transmission design. You can read it at *www.nabfastroad.org*.)

I asked Cindy Hutter Cavell about Geoff's remarks. "We concur with Geoff in his assertion that only Kryptonite-driven FM analog transmitters are capable of 80 percent overall efficiency," she e-mailed back. "However, in the instances where manufacturers were not comfortable with providing data directly to us or were unresponsive, our only option was to access published spec sheets. We wanted both the white paper and the tool to be as complete as possible.

"We know that transmitter manufacturers all calculate their efficiency differently (which we noted in the white paper). As a result, when we asked the various manufacturers for data, we specifically requested that they give us efficiency numbers that represent the AC to RF efficiency of the transmitter."

She said the company suspects that some of the published material presents efficiency data in terms of PA efficiency, but the available literature wasn't always clear and the manufacturers declined to verify in some cases. "We chose to include the published data in the study so that we had as much data as possible. We welcomed (and continue to welcome) comments and feedback from all of the manufacturers." She added that Mendenhall's own feedback about the project was particularly helpful.

COMPARE CAREFULLY

Dan Dickey, president of Continental Electronics Corp., said he welcomes any effort to improve station efficiency. The topic is again on the minds of many engineers and owners now that HD Radio has come into play.

"The linearity and spectral efficiency requirements of HD Radio coupled with the broadcast transmitter marketplace, which is largely driven by initial purchase cost, has created a situation where FM HD Radio does not enjoy a comfortable efficiency margin."

Dickey told me any industry-sponsored program for ranking efficiency must take care to compare the most efficient solution possible with each transmitter in question.

"It is not enough to just say transmitter X is more efficient than transmitter Y. We must look at the overall power consumption required to achieve a certain ERP or coverage area. Only then can

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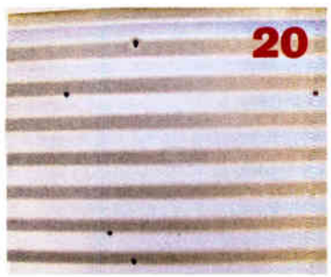

comparisons be made on an equal basis amongst the various solutions to arrive at what will be the most efficient configuration for a given application. This is not so simple a task as it might first appear."

In FM HD Radio, he continued, the efficiency of a given transmitter often bears little correlation to the total power consumption needed to deliver the right ERP. Many other factors affect the result such as building cooling, antenna type, transmission line and tower height.

Dickey suspects all transmitter manufacturers are willing to provide customers with power consumption information for a given application. But, he continued, "I must admit that I am skeptical whether anyone other than the designer of the RF plant is in a position to determine the highest efficiency solution for any given situation."

He suspects that for most radio stations, the most important factor is total cost of ownership. "To get the lowest cost of ownership requires a skilled engineer, armed with all the necessary information, evaluating many different designs to arrive at what will work best in each situation. We would all like this process to be simple. Unfortunately I don't think we have arrived at a point where designing an HD Radio station is as easy as some might wish."

Dickey said designing an FM HD radio station need not be all that difficult but it can be tedious, especially if key information about each element is not readily available. "I think it would be a great help to station designers if something more could be done about that. It is my hope that this industry effort will succeed in that endeavor."

COOL IDEA

It seems safe to say that a web page can't replace a competent engineer — and I imagine the developers of this new tool would agree heartily. Indeed they stressed on the site that while the calculator's results are believed to be reasonable, "far more accurate results can be achieved by conducting an exhaustive energy audit."

With that caveat, I think this tool is another example of clever work being supported by the FASTROAD program. Anything that helps you become a better equipment buyer and facility designer is a good thing; anything that helps you save money is, too. Our "Cool Stuff" judges thought so, as well, and continued their tradition of honoring innovative ideas that present themselves outside of traditional product introductions.

Plus, the calculator is fun. Sit with it for a while and try plugging in variables, to see what I mean.

Try it at *www.nabfastroad.org*, and let me know your thoughts by e-mailing *pmclane@nbmedia.com*. You can also comment directly to NAB by writing David Layer at *dlayer@nab.org*.

NEWSROUNDUP

MEREDITH BAKER: Outgoing FCC Commissioner Meredith Attwell Baker says she followed legal and ethics rules in taking the lead lobbying job at Comcast-NBCUniversal. Baker said she sought advice from the FCC general counsel's office and that the job became available to her after the FCC review of the companies' merger had ended. House members of both parties have questioned whether Baker, junior Republican commissioner at the FCC, was considering the job while reviewing the merger of Comcast and NBCUniversal, which she voted to approve. Her departure leaves one Republican commissioner, Robert McDowell. Baker's term was due to end at the end of June, though she was expected to be renominated. President Obama soon will have two vacancies to fill if Commissioner Michael Copps leaves as expected this year.

AL RESNICK: Broadcast engineer Al Resnick passed away of pancreatic cancer. He was 66. Resnick had been a professional engineer for Carl T. Jones Corp. since 2003, primarily working on engineering projects for ABC-owned television stations, but was well known in radio as well. Carl T. Jones owner Tom Jones said, "Al was very knowledgeable and an excellent engineer," and a teacher. "You could hear him on the phone with clients, giving them a feel for why things were the way they were, so they could make educated decisions." The Gainesville, Va., resident began his technical career in radio as chief engineer for WLS(AM), Chicago, in 1980, managing a staff of 15. He moved on to become vice president and director of engineering for ABC's radio division in 1986. In 1997 he became director of digital transmission engineering for the ABC-owned television stations. In 2001, Resnick was responsible for the rebuild of ABC(TV) in New York after the 9/11 attacks on the World Trade Center. Resnick also was a president of the Association of Federal Communications Consulting Engineers from 2005 to 2006.

AUTOMATION

(continued from page 1)

but quiet back-of-the-booth conversation among automation companies at the NAB Show in April. While several vendors there scorned the claims privately, their actions suggested that manufacturers and broadcasters consider it a serious legal challenge.

It is not clear exactly how much money is at stake but it is surely in the many millions of dollars. One broadcast group that was contacted about a licensing agreement has 27 stations and was asked to pay $600,000 for past usage.

The case hinges on patents issued by the U.S. Patent and Trademark Office to Robert J. Goldman, one in 1997 and another in 1998, both titled "Selection and Retrieval of Music From a Digital Database." It's unclear if Goldman is still involved with the company or exactly who is leading its patent infringement claim efforts.

Attempts by Radio World to reach Mission Abstract Data representatives for comment for this story were unsuccessful.

'WEALTH CREATION'

According to its website, Mission Abstract Data is a Delaware-based company with patented technologies used in the broadcast industry.

The company claims its technologies "have saved the radio industry many hundreds of millions of dollars in costs through the improvement of work flow, more efficient apportionment of human resources, reduction in shrinkage, shipping costs, acquisition of music and inventory tracking."

If any broadcasters, however, had heard of the company before, none have said so.

On its website, *www.missionabstractdata.com*, Mission Abstract Data defended its actions and posted a blog following the case.

"Technology from the 1990s to today, such as the hard drive, computing power (both at very cost-effective prices due to the economies of scale of the PC industry), improvements in audio compression, plus the Internet has enabled a technology-led generation of wealth creation in the form of significant cost savings for the radio station owners," it stated.

Those owners pocketed that profit ... However, not all patent rights used were secured or paid for.

– Mission Abstract Data website

"Those owners pocketed that profit, resulting from reduced cost and increased operating efficiencies, in the past, today and for the foreseeable future. However, not all patent rights used were secured or paid for."

The company insisted in its post that it "seeks only to license valid patent rights and is not seeking to collect value to which it is not entitled."

'PRIOR ART'

However, a source familiar with the case said, "It is common knowledge that systems using hard-disk playback to air were sold and in use by some stations prior to the effective date of the patent in question."

Cox Radio, in its response to the lawsuit, "denies each and every allegation of the complaint" filed by the plaintiff.

Greater Media said in its court filing that the company "lacks knowledge or information sufficient to form a belief as to the truth of the allegations" outlined in the suit.

"[We] deny that Plaintiff is entitled to any of the requested relief. Greater Media respectfully requests that this court enter judgment in its favor and against plaintiff on all claims set forth in the complaint."

The broadcaster also filed a counterclaim and is asking the court to order Mission Abstract Data to pay its costs, expenses and reasonable attorney fees if it is successful defending itself. An attorney for Greater Media said the company would have no public comment on the case.

Beasley, Cumulus, CBS, Cox, Townsquare Media and Entercom also filed counterclaims against Mission Abstract Data, according to court documents. Four of the groups — Beasley, CBS, Cumulus and Greater Media — are represented by the same firms, Phillips, Goldman & Spence in Wilmington, Del., and Cahn & Samuels in Washington.

Contacted by Radio World for comment, representatives of Beasley Broadcasting, Cumulus and Townsquare Media acknowledged the suit but declined to discuss the litigation further.

Clear Channel, which was not named in the patent infringement suit, confirmed that its automation manufacturing arm RCS is discussing the matter with clients

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RADIO AUTOMATION LICENSING AGREEMENT

Representatives of Mission Abstract Data have visited some radio stations asking them to sign a licensing agreement to use their patented radio automation system.

According to Mission Abstract Data's website, the company set licensing fees based on market and group size, claiming that the costs represent a small percentage of money saved by groups and the industry by using its technology.

The licensing agreement outlines specific aspects of the arrangement, which includes directing payment to be deposited into an account at a Wells Fargo Bank branch in Wilmington, Del.

"The length of the agreement continues from the effective date until six years after the expiration of the last-to-expire licensed patent," according to the letter.

Radio World's efforts to reach the two representatives from Mission Abstract Data meeting with broadcasters, Rick Martin and Todd Schmidt, were unsuccessful.

On its website, Mission Abstract Data asks broadcasters to request a licensing consultation with the company.

"Mission Abstract Data LLC's patented technologies will continue to be a cornerstone around which radio evolves. Please take a moment to learn about pricing options available for your group or station — you will find a contact form on the homepage," it states.

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that may be affected by the lawsuit.

The absence of the country's largest broadcaster from the case seems notable. Clear Channel said it has not reached any settlement agreement with Mission Abstract Data in regards to the automation system patent. It declined to discuss the case further.

The next step in the civil case likely will be setting a case schedule for the completion of discovery and motions for summary judgment, according to Bill Ragland, a patent attorney with Womble Carlyle Sandridge & Rice. He is not involved in the case.

"Discovery, including the production of relevant documents, responses to written questions and depositions will also begin."

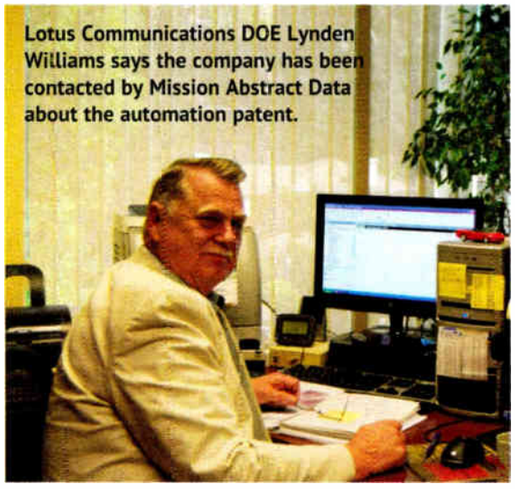
He said broadcasters also could ask the U.S. Patent and Trademark Office for an ex parte reexamination of the patents.

'NOT A VALID SUIT'

Even though the suit names broadcasters and not suppliers, many major automation vendors scrambled to support their customers by trying to identify "prior art" evidence that they had offered this kind of technology earlier.

"Prior art" in patent law represents information that is available to the public before a given date and is relevant to a patent's claim of originality. In most cases, a patent is not valid if an invention had been described in prior art, according to Ragland.

Mission Abstract acknowledged as much on its website in March: "It is in the interest of all parties to understand, as soon as is feasible, if there really is valid, documented prior art and to minimize the amount of money spent on legal bills by all parties. If the claims being asserted are proven to be invalid, due to prior art, from Scott Studios, ENCO or someone else, then there will be no licensing program and the litigation will be dropped."



Lotus Communications DOE Lynden Williams says the company has been contacted by Mission Abstract Data about the automation patent.

Not clear is whether manufacturers will have a legal responsibility to indemnify broadcast users if the patents are indeed upheld, said Ragland. "That would likely be determined by the specific warranties and contract rights set forth in agreements or sales documentation between the parties."

But most automation vendors who spoke about the legal action seemed sure it would not stand.

"We believe there is significant art that would invalidate this claim," said Don Backus, general manager and vice president of sales and marketing for ENCO. "ENCO is cooperating with our affected clients and other automation vendors."

Ray Miklius, vice president of studio systems for automation manufacturer Broadcast Electronics, said, "A large number of our clients are involved in the suit. We are currently pooling resources in order to prove that the patents in question are illegitimate. We think we have uncovered enough evidence already to disprove the patents. This is not a valid suit.

"We will do all we can to protect the interests of our clients against a well-funded and very experienced group. It is a very complicated affair."

Ron Paley, a radio automation industry veteran, said he has evidence that will prove the technology described in Mission Abstract Data's patents existed well before the first patent application was filed in 1994.

Paley said MediaTouch commissioned his former company, Oakwood Audio Labs Ltd., to develop a networked music system in 1991.

"By the spring of 1993 we had built and tested the first super duopoly music system and then installed it that summer for Okanagan Skeena Radio Group in British Columbia, Canada," Paley said. The MediaDisk system contained 5,000 songs on twin redundant servers and serviced four networked radio stations, Paley said.

"The largest hard drive we could find at the time was 2 GB. We had 10 [hard drives] in each server for 20 GB storage. We used a Novell network with SFT3

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Why do Axia consoles do phones best? (Hint: who's *your* daddy?)

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for transparent redundancy," Paley said.

"We used six-to-one compression and 75 percent of the files were mono for the AM stations. This was a very difficult thing to accomplish. And we were dealing with DOS. It wasn't easy work. Windows was in its infancy and Novell was proven."

Paley said what Mission Abstract Data describes in its patent is "basically a storage tank. They are describing exactly what we did — the concept of one, anyway, because I don't think they ever built one."

Paley said he and his brother Ted, also a former executive at Oakwood Audio Labs Ltd., possess prior art that includes full drawings, pictures and installation details of the Okanagan Skeena Radio Group installation and printed color brochures depicting the system.

"We built a second system that was on display in the MediaTouch booth at the spring NAB show in 1994. This was a fully functional system that was for sale and being installed."

Dave Scott, founder of Scott Studios and an early entrant into radio automation, said, "Stations using a digital system to run a satellite or network format who do not have music on hard drive and do not access any centralized music via modem, WAN or Internet, probably are not violating the patent. However, if a station does play music from a hard drive, then there is a question whether the patent is valid." But Scott declined to comment further, citing a confidentiality agreement with an automation vendor that retained his services as an expert witness in lawsuit proceedings.

'ALREADY OUT THERE'

Mission Abstract Data meanwhile was pursuing a second track to collect on its claims.

RW confirmed that at least some broadcasters have been contacted by parties representing Mission Abstract Data asking them to sign licensing agreements. A letter obtained by Radio World from one of those parties discussed pricing information (see sidebar).

Lindy Williams, director of engineering for Lotus Communications Corp., said his group was contacted.

"I'm probably the worst person they could deal with on this. In the fall of 1992 KWKW(AM) in Los Angeles was using two Audisks, with 2 GB SCSI drives. One carried all of the commercials, while the other Audisk held several hundred songs. We were on the air with it two years before (Mission Abstract Data) even applied for their patent."

Williams is attempting to retrieve the expansion chassis that housed the six music drives from KWKW from a storage facility, which still would have the music files and likely a record date on it, he said.

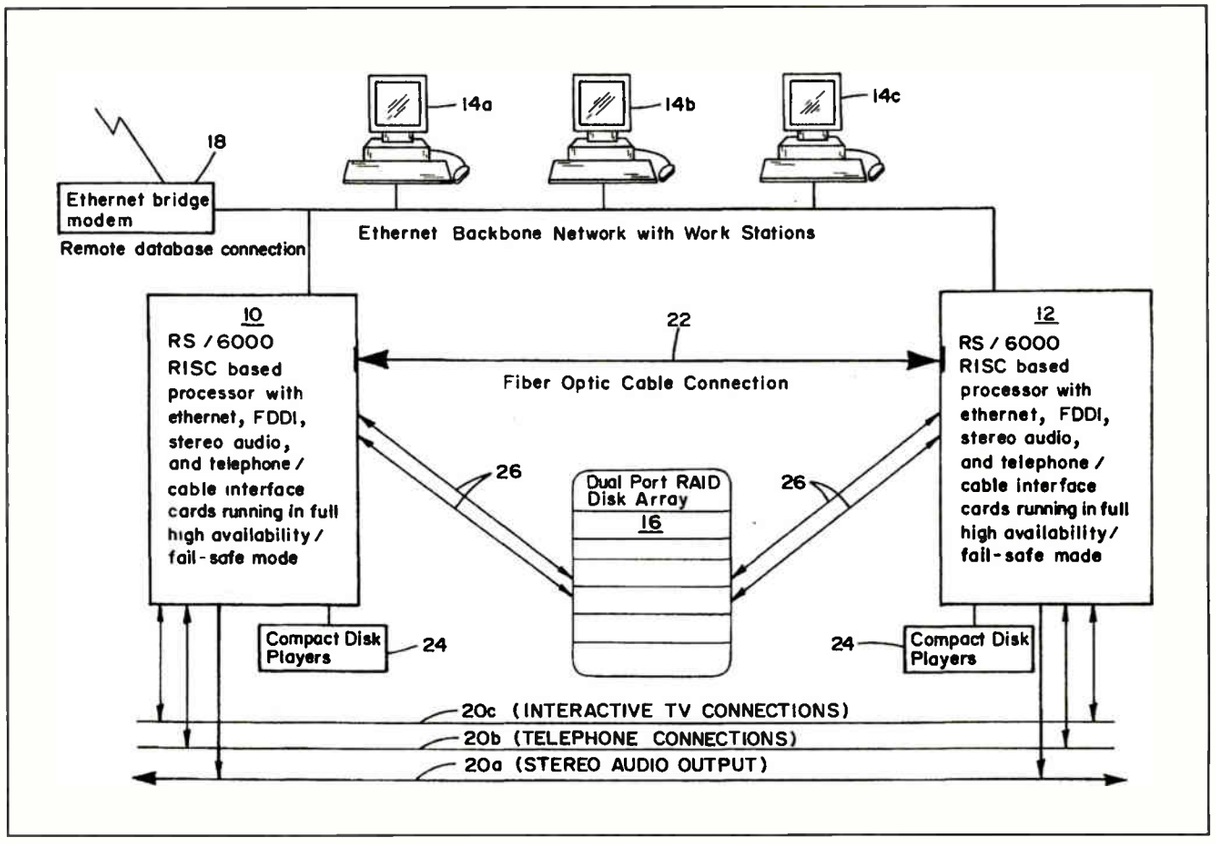
"I find the granting of this patent insane. The research done to determine what was already out there in the field was abysmal," according to Williams. He said Mission Abstract Data calculated that Lotus owed them "$600,000 for just the past usage of the technology based on the number of radio stations" in the group.

Lotus owns 27 radio stations in three Western states, he said.

Patent attorney Ragland said broadcasters should be prepared for a lengthy court case.

"In the federal court in Delaware, the average time from the filing of a complaint through trial is just over two years."

Comment on this or any story. E-mail radioworld@nbmedia.com *with "Letter to the Editor" in the subject field.*



The case hinges on two patents issued by the U.S. Patent and Trademark Office to Robert J. Goldman, one in 1997 and another in 1998, both titled "Selection and Retrieval of Music From a Digital Database." This diagram is from one of those patents.

MISSION ABSTRACT'S CLAIM

What exactly did Mission Abstract Data patent? U.S. patent numbers 5,629,867 and 5,809,246 each are about six pages and include diagrams and descriptions of a music storage system on hard drive. The wording of the abstracts of the two patents varies slightly. The earlier patent includes wording of "a digital radio broadcast station which includes a single on-line digital database," while the later version of the patent mentions "a common digital database." The company believes the technology is being used by thousands of broadcasters.

The first of the patents was applied for in 1994 and granted in 1997. They are a technical portrait of many digital radio broadcast stations. The company lawsuit describes a broadcast industry shift to its technology.

"Prior to the invention set forth in DigiMedia's patents, operation of a music-based radio station was a cumbersome and expensive process. In a typical prior art radio station environment, the disks to be played and broadcast were located and retrieved from a CD musical library. The disks then were loaded into a CD player. The technology covered by the claims of the DigiMedia patents was a revelation in the radio industry," according to its suit.

In a March blog post, the company appeared to base its defense of the patents partly on whether automation systems of the early 1990s could store hundreds of songs rather than a limited number of short clips. It said the mere existence of music on hard drive prior to 1994 would not invalidate its claims because its patents specifically are for a system with hard drives containing at least several hundred songs.

"It was the determination of the Patent Office that no one had previously published materials that described a system in which at least several hundred songs were stored in a database resident on one or more computer hard drives in an array that could be played using software on a computer (no particular kind of software, no particular features for automation being required) over a radio broadcast," it wrote.

It also said the Patent Office looked at 13 prior U.S. patents as well as several articles and press releases before issuing its approval.

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> Chris Larke, Broadcast Engineer, CHUM Radio Vancouver

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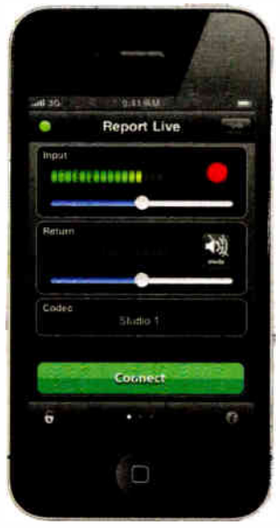
Our setup time for remotes has been reduced immensely and our announcers love using a wireless Live IP codec that is small enough to fit into your pocket. We can configure every setting from the studio end and all a reporter or announcer needs to do is open the app on their iPhone and connect at the touch of a single button.

We use Report-IT to broadcast our afternoon show live on-location, as well as sports interviews and reporting. Our sports reporters often use it to file reports via FTP and our producers can get these reports to air long before any other station.

We have a few advertising clients that like to voice their own spots but scheduling the client's time with studio time is often a challenge. The simple solution was to get the client to download the app for free and voice their spot using Report-IT. The quality of the built-in microphone on the iPhone 4 is excellent for this type of voice work and clients can FTP the 20kHz audio back to the studio at the touch of a button!

Chris Larke, Broadcast Engineer, CHUM Radio Vancouver



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JK Audio
BlueDriver S-Series Wireless Audio Interface

The "Cool Stuff" judges have recognized JK Audio designs before; and they like the new BlueDriver S series of audio interface adapters.

CSR aptX promises great stereo audio quality over Bluetooth wireless connectivity. Audio frequency bandwidth provides "hi-fi" performance while low audio coding delay minimizes latency effects and "lip-sync" issues.

S series models are dedicated transmitters or receivers. You can mix any female transmitter with any male receiver. These models also pair to other JK Audio Bluetooth-equipped products, which soon will feature aptX low latency as well, and remain compatible with other SBC-equipped A2DP products.

Photo by Jim Peck

This award selection is yet another example of how radio engineers are expressing more interest these days in products that are not traditionally thought of as being just for "radio." (Meanwhile, Joe Klinger was equally excited by the attendee response to his pending new Concierge 2x6 radio talk show system and companion Guest Module series of control surfaces.)

Working the mics, from left, are Wayne Reed, Joe Klinger, Linda Klinger, Eric Klinger and Gary Eiklor.

Info: www.jkaudio.com

Broadcast Software International
Op-X Remote for iPad

The Op-X iPad Remote Client connects via secure gateway and has the ability to access all stations on your Op-X radio automation server.

The remote client for iPad was designed to run a live show and view the on-air log remotely. With the use of an external or built-in microphone you can record voice tracks, then upload and insert the voice tracks directly into the live log for playback. Additionally, it offers the ability to fire off audio and automation commands real-time from on-screen hot buttons, start and stop playback remotely and cut and paste items into the live log.

From left are Gary Kline, Alex Roy, Marie Summers, Frank Klekner (rear) and Dave Supplee.

Info: www.bsiusa.com

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Broadband Internet is everywhere. Which makes it ideal for live remotes.

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Stations Work to Implement AE

Artist Experience, HD in Cellphones Are Priorities for Digital Backers

BY LESLIE STIMSON

LAS VEGAS — IBiquity Digital President/CEO Bob Struble has always been upbeat about the outlook for HD Radio; but these days he's expressing a refreshed sense of optimism. He believes more stations will convert to digital and that others will upgrade digital power to allow the transmission of more data services.

"The industry hasn't spent money for a few years. There's basic maintenance, upgrades, etc. [that need to be done], and I think we'll benefit from that."

He senses that many broadcasters who are planning to upgrade plants, even in small markets, will convert to digital at the same time.

Vendors at the recent NAB Show seem to share his optimism. They told Radio World that stations plan to spend more on upgrades this year and some are expressing interest in converting to digital or upgrading HD Radio power.

Here's more on HD Radio news from the show.

photos by Leslie Stimson

This VW HD Radio displays an image of Randy Travis while one of his songs airs on the HD2 channel of KWNR(FM), Las Vegas.

The newest HD Radio portable that displays images synched to audio is the Cydle P29H. The unit has a 2.9 inch screen, MP3 player and rechargeable battery.

DEVELOPMENT WORK AIMS AT RADIO IN CELLPHONES

NAB's program called FASTROAD — "Flexible Advanced Services for Television & Radio on All Devices" — is supporting efforts to encourage the integration of HD Radio into cellphones and other portable devices.

The return path provided from a phone or other device back to the station has the potential to elevate radio's ROI from HD Radio, according to proponents.

"We think the return path has business potential" for both stations and advertisers, said Emmis Communications President/CEO Jeff Smulyan. "We think we can provide couponing from a phone. Near a point-of-purchase we can provide a call to action. We think it's a game-changer for us and benefits the wireless services."

For years proponents have hoped to see HD Radio used in cellphones, most likely after analog FM penetrated such products. Current development work is aimed at supporting both.

NAB says new chip designs allow the use of an integrated antenna rather than one built into the headphone cord. NAB also has signed a contract with Silicon Valley company SiPort to develop an HD Radio application for iPhone and Android that works with an FM HD Radio chip in mobile devices. SiPort specializes in chips that consume less power and occupy less space, as required by portables. Its chip is used in the Insignia HD, for example.

BIA is the project manager, and iBiquity and the Broadcast Traffic Consortium are involved.

Their view is that a cellphone with HD Radio reception and associated app becomes an "end-to-end" system, providing not only a broadcast path from station to listener but also a return path to the broadcaster and an additional back channel to the user. This allows more interactivity between the digital broadcaster and the consumer.

BTC is driving the broadcast side while iBiquity and SiPort are working on app development.

"In our minds, cellphones would have the receiver in them and you'd use the app to get [the interactive aspects of] HD Radio," said Lane Bruns, iBiquity vice president of portable products. Wireless companies would spend less than $4 to add an HD chip to a handset, he said.

Talks are underway to involve other chipmakers in the development. IBiquity President/CEO Bob Struble believes the HD app will be ready this year.

STRUBLE: STATIONS SHOULD ROLL OUT AE SOON

Development work is underway at various radio groups to implement Artist Experience, the HD Radio feature that enables images to be synched with audio, Bob Struble said.

That effort will proceed, he continued, regardless of whether the government mandates FM chips in devices.

Clear Channel is beta testing the AE feature in 18 markets. Supplier Jump2Go offers a solution, as does Broadcast Electronics, while the Broadcast Traffic Consortium of station owners is working on one.

Struble says that for AE to work, the station's automation system must recognize the content ahead of scheduled air time and look up the associated images.

(continued on page 16)

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HD RADIO

(continued from page 14)

That data is transmitted along with the HD Radio signal and stored in the receiver. When the song or other content plays, the associated image displays.

Although manufacturers and developers are finding ways to make this work, Struble said he worries the process isn't happening fast enough. Some radios on the market have the capability to display Artist Experience now, and more will come this summer as automakers will roll out new models.

A CALL FOR A NEW CAR STRATEGY

Broadcast Traffic Consortium leader Paul Brenner echoed Struble by saying radio needs to go digital and offer advanced data services to compete with other media, especially in the dash.

"In this digital space, where you're competing to be prominent or dominant against the other digital mediums, you have to be able to deliver this kind of technology."

He described sitting with iBiquity Digital in meetings across the table from automakers, trying to persuade them that terrestrial radio can deliver traffic data with lower operating costs and more efficiently than satellite and mobile broadband can.

At least half of all new cars out in 2012 will have digital dashboards. Internet radio for the car has been in production for years but terrestrial radio is "kind of late" to the party, he said. "Digital radio is not optional. We need to show [automakers] the analog radio industry has a plan."

Struble went further, saying that more HD Radio receivers are coming for cars, homes, and soon, broad-based mobile devices. "Those radios display very compelling digital capabilities. If your station is not showing these, it's going to be left behind, and the consumer's going to have a bad experience."

Shortly after the show, Jacobs Media President Fred Jacobs called for the formation of a task force to address the issue of radio's position in the dash.

DOYLE CONCERNED ABOUT ADOPTION

FCC Audio Division Chief Peter Doyle said he's concerned about the slowdown in HD Radio conversions and the relatively low number of stations that have raised FM digital power levels.

In an interview with Radio World, Doyle said 1,627 stations had converted to digital by early April, or about 16 percent of total stations. The conversion rate has slowed to "maybe a handful" each month, he said, attributing much of that to the poor economy.

Station engineers have told Radio World that cuts in capital expenditures have affected the pace of digital conversions and power increases. Critics say stations that intended to adopt the technology have largely done so and that conversions have peaked.

Struble told Radio World the poor economy accounts for the slowed numbers. "It's dollars, pure and simple. There's not a lot of dollars sloshing around for capital expenditures, although that is improving; in that sort of environment I think you'll see a gradual upgrade."

We've previously reported that as of early March, 225 FMs had increased digital power. The pace concerns the Audio Division chief.

"Replicating analog coverage is such an important part of this I would hope for greater broadcaster action to take advantage" of the power increase, which the agency approved last year, Doyle said.

HD proponents believe many more facilities would qualify if the agency were to allow stations to raise digital sidebands unequally, or "asymmetrically," in order to protect neighbor stations from potential interference.

IBiquity Digital Manager of Broadcast Marketing Roy Sampson demos the VW HD Radio featuring Artist Experience.

photos by John Stalley

In two vehicles, iBiquity demoed HD Radios with the Artist Experience feature. It also ran a contest linked to live images displayed by KWNR(FM) HD2 at certain times. Booth visitors received a card with a description of a vehicle equipped with HD Radio technology. Attendees whose cards matched the images displayed in the booth won portable Insignia HD Radios.

CAP EAS ALERTS TRANSMITTED USING HD RADIO

Global Security Systems, Sage Alerting Systems and iBiquity say HD

(continued on page 18)

COOL STUFF AWARD RADIOWORLD 2011

Burk Technology Climate Guard

Here's a sensible extension of the product line from a company that knows about remote control and monitoring.

Climate Guard monitors temperature, humidity and other conditions that can cause serious IT disasters. It includes temperature, light and sound sensors, of which you can expand to 64. Web interface and SNMP capabilities eliminate the need for dedicated computer software. The system notifies IT personnel of problems via e-mail, SMS or SNMP traps to ensure a quick and effective resolution.

As Burk puts it, "Server rooms and data centers of all sizes require comprehensive monitoring of environmental conditions to detect a problem as early as possible. Climate Guard monitors temperature, humidity, flood/leak and many other conditions that can cause serious IT disasters." It can catch gradual changes as well as sudden ones, with onboard charting. Climate Guard has obvious applications beyond traditional broadcast environments.

Stephen Dinkel and Jon Burk are shown.

Info: www.burk.com

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APT, WorldCast Systems Group SureStream Technology

APT promises that its SureStream technology delivers "the audio quality and reliability you expect from a T1/E1 link at a fraction of the associated cost."

This technology frees up broadcasters who want to move to IP from having to insist on MPLS networks or guaranteed bandwidth. The manufacturer says one or two public IP links are enough to ensure continuity of service and of audio quality.

Testing, APT says, bears this out. "Across two separate ADSL links, which together suffered over 5,000 dropped packets and 12 connection losses, SureStream ensured that not a single packet was lost and the THD was 100 percent unaffected."

SureStream has been implemented in the new WorldCast Horizon NextGen codec, shown, and is aimed at a variety of uses. For remote and outside broadcast applications you can run SureStream on an IP link from a single supplier; for a mission-critical STL, SureStream across two links from separate suppliers provides optimum redundancy.

Shown: Left, from top: Christophe Poulain, Tony Peterle and Cedric Ferreira; right, Kevin Campbell, Fabricio Sanabria and Nicolas Boulay.

Info: www.aptcodecs.com

HD RADIO

(continued from page 16)

Radio broadcasts can transmit next-gen EAS audio and text messages using the Common Alerting Protocol.

On April 6, WTGE(FM), Baton Rouge, La., became the first HD FM station to broadcast CAP-EAS messages over HD Radio, according to participants. The Guaranty Broadcasting station used a Sage Digital Endec.

CAP-EAS messages are received on the Endec via GSSNet, a satellite data delivery system, or the Internet. The messages are processed, converted and transmitted using an HD signal, where the alerts are heard on enabled HD Radio receivers. Arthur "Bo" Hoover, veteran broadcast engineer and Technical Service Group president, facilitated the installation at the station along with Sage and GSS.

Test CAP EAS messages with text were sent across an HD Radio broadcast channel successfully, according to Sage, iBiquity and GSS; they said this verifies that HD Radio is compatible with the Integrated Public Alert and Warning System and other emergency notification systems, including Alert FM. The tests also show CAP EAS is compatible with AM transmission, according to Sage, iBiquity and GSS.

Sage, iBiquity and GSS said EAS messages now can be broadcast audibly through analog FM and with audio and text over HD Radio via the Sage Endec, as well as textually through Alert FM's use of RDS.

ASYMMETRICAL SIDEBAND DRIVE TEST RESULTS ARE IN

IBiquity, NPR Labs, Nautel and WAMU(FM) in Washington detailed their latest test results comparing symmetrical to asymmetrical HD sideband transmission and reception. They said the field data essentially confirm lab results presented at the fall Radio Show.

"We think the ability to apply asymmetric power is very useful," said Russ Mundschenk, field test and implementation manager for iBiquity Digital. He presented results based on tests that used the digital signal of Greater Media's WKLB(FM), Boston.

The station and iBiquity conducted tests south to Warwick, R.I. and north to Manchester, N.H., comparing digital symmetrical vs. asymmetrical sideband transmission at –14 dBc, –10 dBc and –17 dBc.

WAMU, like WKLB, has experimental authority from the FCC to operate at digital power levels above –14 dBc and with asymmetrical sidebands. WAMU is using Nautel's PowerBoost technology.

In drive tests in rural Virginia, the team tested reception using symmetrical vs. asymmetrical digital sideband transmission. The asymmetrical sideband power was –13 dBc on the low side and –17 dBc on the high side (the symmetrical equivalent levels of –10 dBc, –14 dBc).The asymmetrical sideband operation with –13/–17 dBc increased the total digital power close to the theoretical 493 Watts, compared to –14 dBc symmetrical operation. Station personnel noticed that the HD Radio signal extended several miles farther than it had before, and there were some spots where dropouts were filled in.

Nautel's Hal Kneller said WAMU did not notice deleterious effects to its analog signal with the HD PowerBoost operation at any of the sideband levels tested with asymmetrical operation, nor was there any apparent affect at –14 dBc with HD PowerBoost on or off.

Parties involved with both tests told Radio World they intend to meet with the FCC about the results.

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What Next? Kevlar Engineering Uniforms?

These Aren't the Kind of Bullets You Want at Your Transmitter Site

WORKBENCH
by John Bisset
Read more Workbench articles online at radioworld.com

Lest you think copper theft is the worst that could happen to a broadcast engineer, Cumulus Engineer Robert Combs said someone decided recently to use the WJAD(FM) transmitter building in Albany, Ga., for target practice.

Judging from the bullet holes, seen in Fig. 1, a smaller-caliber hunting rifle was used.

Contact law enforcement if you experience station vandalism of any kind. Robert got in touch with the Lee County Sheriff Office, which took a report. They turned the case over to detectives but at last word there was no movement in the case.

From the angle of the bullet holes, the shots came from the property gate or the house next to the gate. As you can see, bullets penetrated the building wall. Fortunately, nothing inside was damaged and no one was hurt, though the transmitter side was dented.

Do engineers now need to worry about wearing bullet-proof vests when visiting transmitter sites?

You may recall me telling you several years ago about two separate incidents of site vandalism. Both engineers reported the vandalism not only to local law enforcement officials but also to the FBI, since radio stations are federally-licensed facilities and this was not long after 9/11.

Fig. 1: Bullets penetrated this transmitter building.

In one instance, the field agent made a thorough effort to identify the perpetrators, who ultimately were arrested. In the other, though, the agent's attitude essentially was, "You've got to be kidding. I don't have the time for that."

Such situations should raise the ire of readers. Your thoughts and comments will be appreciated. My e-mail is at the end of the column.

Robert Combs can be reached at *robert.combs@cumulus.com*.

Fig. 2: Fortunately, the only dents were to the exterior of the transmitter, not to humans.

Pete Baisner read about the broken neutral in the Jan. 12 *Workbench*. This reminded him of a situation he encountered some years ago.

A boy's camp in sunny California was having trouble with its local generator not keeping a constant voltage with load cycling. The camp kept losing its microwave ovens on a regular basis. A simple modification to a GFCI solved their problem and the fix is working to this day.

The modification involved a SIDAC or silicon diode for alternating current, a member of the thyristor family available from Digi-Key or Mouser for less than a dollar, and a 2 watt resistor from 10k to 20k or so. The SIDAC and resistor are wired in series from the ground fault circuit interrupter AC input brass terminal

(continued on page 22)

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WORKBENCH

(continued from page 20)

(black wire, hot leg) to the GFCI output side (load side) to the silver terminal (neutral leg).

In case of an overvoltage situation, the SIDAC turns on and a few milliamps of current upsets the GFCI and it shuts off, thus protecting the equipment connected to the load side of the GFCI.

To get really fancy, one could even put an LED and a diode in series with the resistor/SIDAC combo and get a visual indication of overvoltage problems.

The SIDACS come in all kinds of voltage breakdowns. Teccor/Littelfuse part #K1300G is rated 120–138 volts, and part #K1200E70 is rated from 110–125volts. You could also add a second resistor to the incoming AC side, forming a voltage divider, and choose the exact cutoff voltage.

At this point it might be a good idea to ascertain that the AC loads are well balanced and that there is not a lot of current in the AC neutral. It's also a good time to make sure there is no current in the EGC or equipment grounding conductor, also known as the GREEN wire.

A clamp-on ammeter is a most useful tool for this job.

A Cen-Tech Model 96308 available from Harbor Freight (*www.harborfreight.com*) costs $9.99. Model 95683 has a bigger jaw and is $13.99.

Thanks, Pete, for a novel way to protect equipment and for tips on ensuring that loads and currents are balanced.

Pete Baisner can be reached at *baisner@pacbell.com*.

Kent Kramer is director of engineering for Reach Media. Seeing Clay Freinwald's tech rules to live by in our April 20 column, he adds his own:

"If it's jammed, force it. If it breaks, it needed to be replaced anyway."

Thanks, Kent and Clay, for reminding us of the lighter side of broadcast engineering. Kent Kramer can be contacted at *kent.kramer@reachmediainc.com*.

Radio amateur Fred Shetler has a neat suggestion for packing emergency "stuff" in anticipation of those extended transmitter visits or emergencies.

Fred stores his goods in plastic FoodSaver or similar brand bags (do an online search for "FoodSaver Vacuum Sealing System"). The system creates a vacuum and effectively seals the bag. The plastic is tough and the contents are well protected.

When you are ready to use the contents, you simply cut the bag open.

The process isn't fancy, but it is inexpensive and effective at keeping contents clean and waterproof. Another benefit: You can make the bag as long or as short as you need. Fred uses several bags to store food, first aid supplies and clothing, opening them as needed.

K3VMS, Fred Shetler can be reached at *weltetri@localnet.com*.

John Bisset marked his 40th year in radio in broadcasting recently. He works for Tieline Technology and is a past recipient of the SBE's Educator of the Year Award. Reach him at johnpbisset@gmail.com *or (603) 472-5282. Faxed submissions can be sent to (603) 472-4944.*

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

PEOPLENEWS

Providing concert recordings to radio stations for broadcast is part of the gig for **Andy Ebert**, who is working for the band **Stone Temple Pilots** as monitor and live recording engineer. He mixes sound for the performers' in-ear monitors and monitor speakers, and also multitracks each show to ProTools for archiving.


Andy Ebert

Jim Burgoyne becomes chief operating officer of Frandsen Media Co., a newly created position, with oversight of 20 AM and FM stations, 20 websites and various social media accounts in Utah, Southeast Idaho and Western Wyoming.

Karen L. Mateo was promoted to senior vice president, communications by **CBS Radio**. She is responsible for internal and

COOL STUFF AWARD RADIOWORLD 2011

Comrex Corp.

LiveShot Video IP Codec

Radio stations are evolving into multiplatform media providers, so we should expect to see more nontraditional products from manufacturers.

Comrex Corp. — 50 years old this year — usually can be found looking ahead. The company may have its eye on the TV market with the LiveShot Video IP Codec; but the product will also serve radio broadcasters who are serious about populating new content channels.

LiveShot uses the BRIC Technology found in other Comrex IP codecs; it attaches to a professional camera's battery mount to get you on the air with live, real-time, low-latency video and audio, optimized to perform on 3G/4G cellular and satellite IP data networks. It also accommodates Wi-Fi and wired IP data connections.

Notably, a "store and forward" feature can capture, manage and send higher-resolution video to an FTP server when your live shot is done.

Features include video return, integrated IFB, Wi-Fi and Bluetooth interface. The system can be controlled and configured locally or remotely via the Comrex LiveShot Central server.

Chris Crump, at left in photo, warms up the pipes for his live shot, with Kelly Clark (front), Dave Christenson (rear), Tom Hartnett and Jim Godfrey in support.

Info: www.comrex.com

Karen Mateo

external communications functions for CBS Radio, its 130 stations and digital media properties; she also heads media relations for the CBS Interactive Music Group, which includes Radio.com, Last.fm and MP3.com, and supports CBS Local Digital Media.

David Ensor

The Broadcasting Board of Governors named broadcaster and communications executive **David Ensor** as director of the **Voice of America**. He has been director for communications and public diplomacy of the U.S. Embassy in Kabul, Afghanistan since January 2010 but is more known to the public as a journalist, having worked in prominent roles at CNN, ABC News and National Public Radio. VOA Director **Danforth Austin** is retiring.

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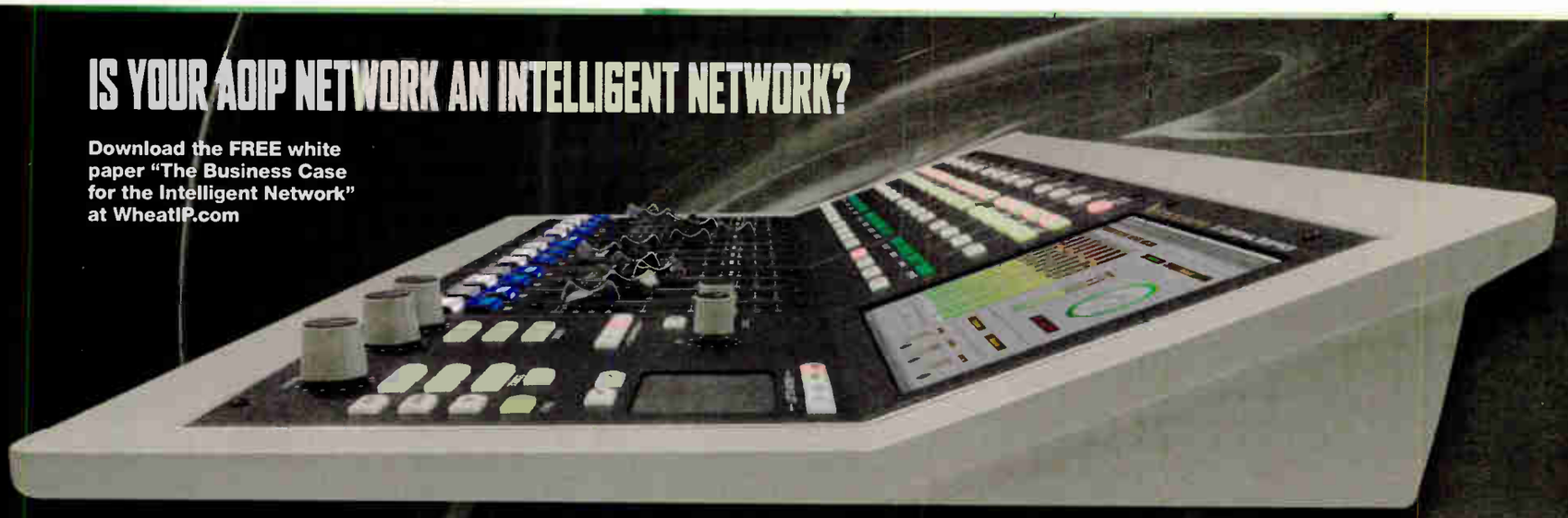


Tech Experts Talk AM Radio

BEC Offers Helpful Tips and Inspiring Comeback Stories

BY THOMAS R. MCGINLEY

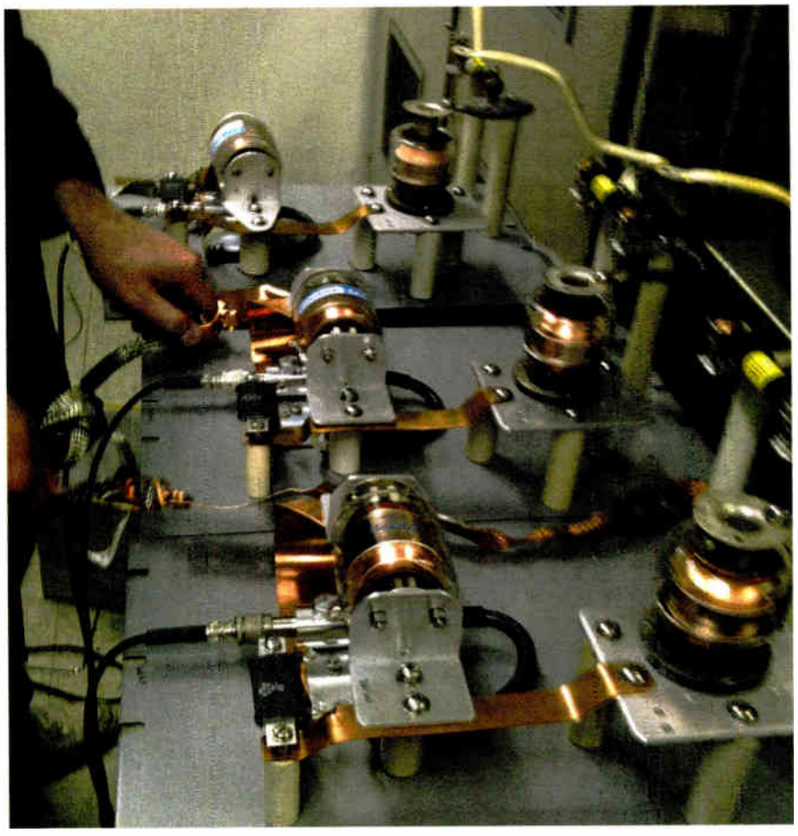
The long-term outlook for AM radio has been the subject of much discussion in Radio World and beyond; but the

FIRSTPERSON

availability of impressive AM engineering information is alive and well, judging from the offerings one morning at the spring NAB Show Broadcast Engineering Conference.

The session on AM transmission was called the best of its kind in years by many who attended. It featured six timely papers from some of the most recognized antenna systems experts.

Topics included new power dissipation techniques to improve AM DA bandwidth performance; new voltage sampling devices for MoM DA proofs; the rebuilding saga of WWVA after a 100 mph windstorm; the building and rebuilding adventure of KRKO after eco-vandalism; and the construction of an AM DA array in a Phoenix landfill. CBS Radio Senior Vice President of Engineering Glynn Walden chaired the proceedings.



Ben Dawson discussed a sampling technique for DAs that can't use current transformer or loop sampling devices because of FCC rule constraints. Base sampling using identical custom capacitive voltage divider networks, shown, were used.

BURN OFF THE NEGATIVE

Ron Rackley, partner in consulting engineering firm du Treil, Lundin & Rackley, led with "AM Directional Antenna Pattern Bandwidth Improvement Using Power Dissipation."

The test case was Radio Disney's WDWD, a four-tower, in-line 12.0/4.5 kW DA-2 array on 590 kHz in Atlanta.

The legacy pattern was typical of those designed and installed before about 1970, with the multiple penalties of space phasing deficiency, deep side nulls and a very high RSS/RMS ratio. The imbalanced sideband performance produced very high null distortion. As a result, the station was practically unlistenable over half of its azimuth coverage pattern.

Rackley described his well-honed technique of using computer-modeled iterations of different phasing and branching schemes with incremental load rotation to best match the pattern bandwidth performance of both the upper and lower 10 kHz sidebands with the carrier frequency.

A major challenge to achieving good results in the WDWD pattern was the high amount of recirculated power from the negative tower. The consultants performed a moding analysis of the pattern and modeled to derive a more optimal balance of tower power distributions that lowered the amount of negative power to about 2,400 watts.

FCC rules had always required DA stations to operate with licensed total transmitter power, and any negative power had to be recombined at the power divider. Rackley proved that by dissipating the negative power in a resistive load and not recombining, the result was dramatic improvement in pattern bandwidth performance. He was successful in convincing the commission to allow increased transmitter output power to make up the difference. The team did a Method of Moments proof.

Rackley says, "WDWD can now be heard very well, with almost no distortion around the entire pattern including the deep null areas." Request a PDF copy of his paper by e-mailing *ron@dlr.com*.

SAMPLING TECHNIQUE

Ben Dawson of Hatfield & Dawson Consulting Engineers unveiled the inner workings of a new sampling technique for DAs that aren't able to use current transformer or loop sampling devices because of FCC rule constraints.

The test case here was CBS Radio's KPTK in Seattle, a three-tower 50 kW diplexed array using 160 degree tall towers on 1090 kHz.

(continued on page 28)

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AM RADIO

(continued from page 26)

The towers are all guyed and of equal height and width, but they do not have the same cross-sectional lattice design, thus eliminating the legal use of sampling loops. The different cross-section designs would result in unequal coupling to loops, and so base sampling using identical custom capacitive voltage divider networks was used instead. CBS Radio Seattle's RF Facilities Manager Arne Skoog fabricated these on rack-panel bases installed inside the LTU cabinets that they can be removed easily for calibration testing.

Dawson discussed the details of how an accurate mathematical model of the base of towers must be generated to comply with MoM DA proofing rules whenever current or voltage base sampling is used.

Every device connected across the tower base must be included in the model and its reactive shunt loading effect calculated to produce accurate results for the MoM-required impedance matrix calculations. For these 50 kW high-impedance tower bases, relatively low values of capacitance-coupled sampling devices have a negligible effect on the total base loading or the operating parameters of the other diplexed station, but generate adequate voltage levels to drive the antenna monitor.

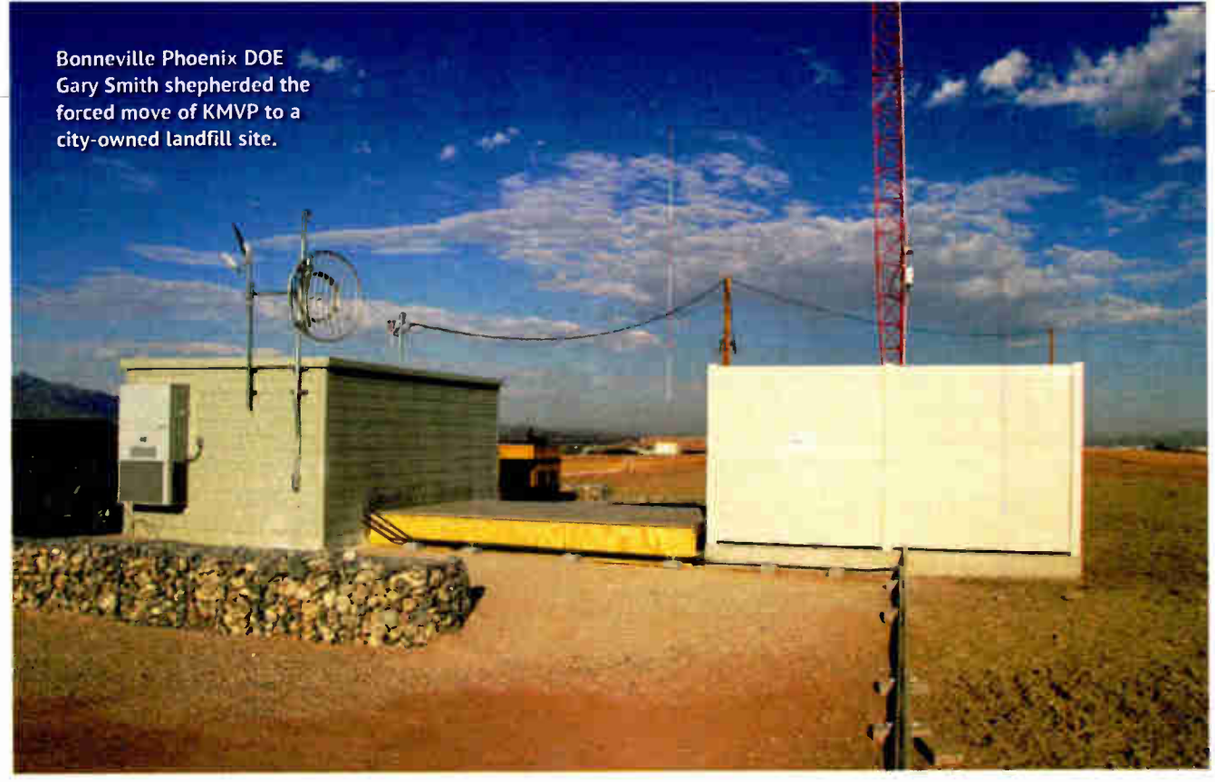
The high-voltage vacuum capacitors used in this application have proven to be temperature-stable and can be self-healing when subjected to lightning and static discharging.

Dawson reported that KPTK was granted the first FCC MoM proof application for station license using voltage sampling technique just a few days before the NAB convention.

WINDS TAKE DOWN HISTORY

WWVA, the venerable 50 kW 1170 Clear Channel Radio station in Wheeling, W.Va., lost all three of its original 420-foot, self-supporting Blaw-Knox towers last year in a freak windstorm. They dated to the early 1940s.

John Warner, CCR's vice president for AM engineering and its designated direction antenna czar, became the point man. His first goal was to restore station operations with an emergency antenna as quickly as possible. His larger challenge was the complete rebuilding and retuning of the array.



Bonneville Phoenix DOE Gary Smith shepherded the forced move of KMVP to a city-owned landfill site.

Because of the extraordinary expense of replacing such tall self-supporting towers, Warner had to settle for guyed towers in the insurance coverage.

Warner proudly stated that he "put on his ham radio hat" and installed a 150-foot, inverted-L emergency wire antenna to get WWVA back on the air.

Once the fallen tower sections were removed, the team strung the wire between two of the remaining 60-foot upright sections of adjacent towers. The wire was brazed at the top of one and driven at its base insulator into a 5 –j400 driving point impedance. Power was reduced to 5 kW for emergency operations, which continued for several months as construction of the replacement guyed towers commenced.

Using the National Electrical Code, Warner calculated the self-impedances of the new guyed towers at 608 –j449, which was dramatically higher than the original impedances of the self-supporters. Major changes to the LTU and phasing system designs would be needed. To reduce the magnitude of the change and simplify the overall redesign, each tower base was loaded with a shunt capacitor of –j400 ohms, thereby reducing the base resistances to about 250 ohms.

Warner included the necessary redesign and hardware requirements to accommodate the new guyed towers in his insurance claim.

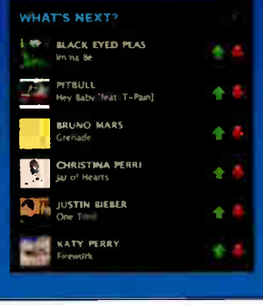
(continued on page 30)

Broadcast Electronics CrowdControl

CrowdControl is a "crowdsourcing" application marketed under BE's data brand The Radio Experience; it was developed with interactive software company LocalMedia.

The company says the application "offers a new approach to an old pursuit: that of engaging the listener." It is a studio application that enables broadcasters to interact with listeners in real time through social media outlets like Twitter and Facebook.

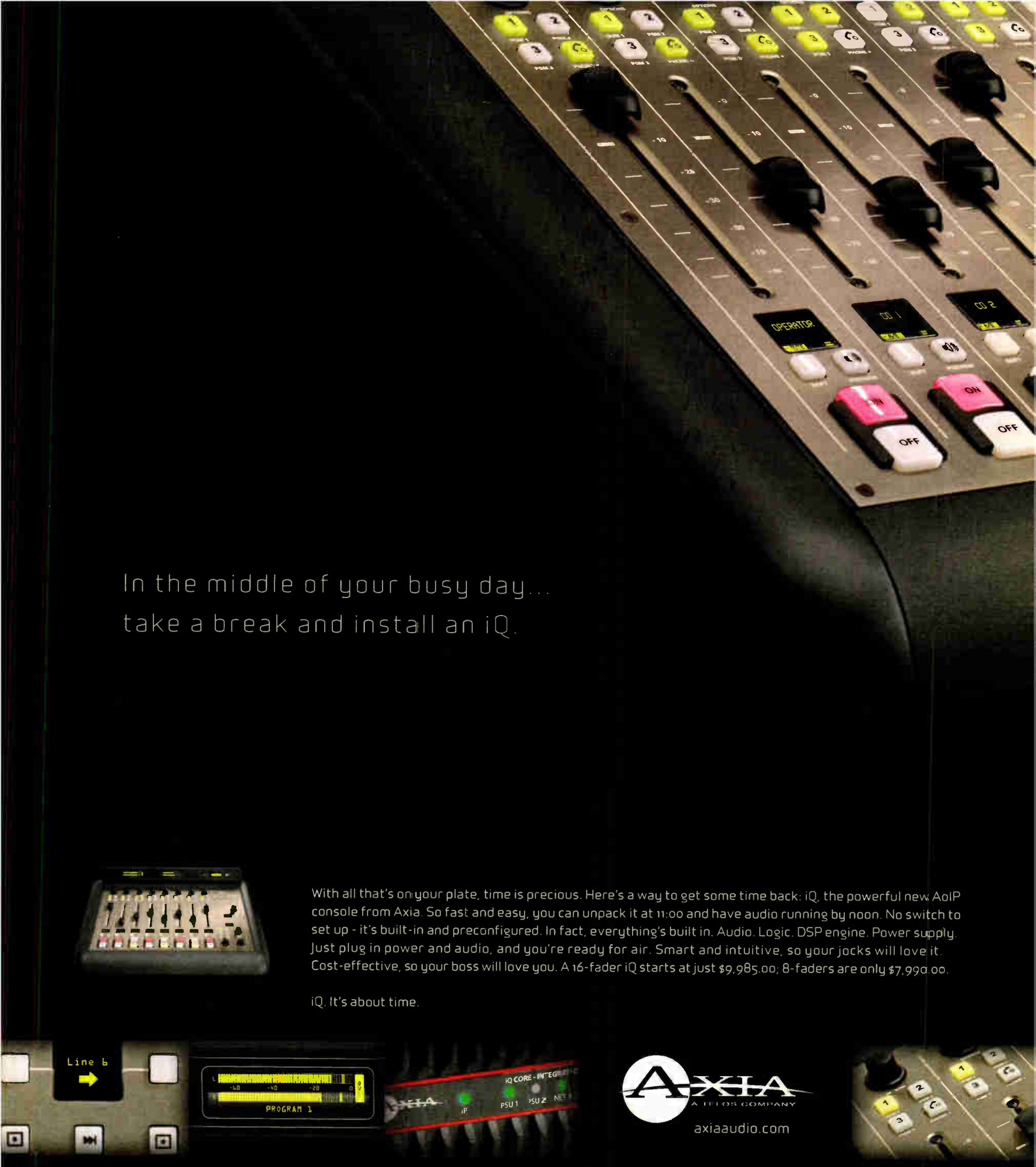
"More important, though, are the ways in which CrowdControl opens the door to listener-sourced programming," BE says. Air talent can use it to poll for song requests from listeners using iPhones or PCs, interact with listeners from the studio for all social media and post status updates in real time. "Most-voted" songs can be played at a set time or as listeners vote. The polling data can be used to update song rotation schedules automatically in the station's automation system.



CrowdControl can be set with scheduling parameters to ensure that stations follow programming guidelines. "In the case of an HD Radio multicast channel, for example, CrowdControl enables the station to run 24/7 under listenership control but within predetermined program parameters."

Shown, BE's Brenna Ormond, left, and Jim Roberts, right, look on as Radio World Editor Paul McLane presents the award to President/CEO Joseph Roark.

Info: www.bdcast.com



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iQ. It's about time.

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AM RADIO

(continued from page 28)

FIELD APPLICATION

Tom King, president of Kintronic Laboratories, presented the first field application and MoM proofing using the KTL Voltage Sampling Unit device introduced at last year's NAB Show.

WAOK, the CBS Radio facility in Atlanta, operates a four-tower 25/5 kW DA-2 array that uses two guyed and two self-supporting half-wave towers on 1380 kHz. Chief Engineer Robert LaFore and field consulting engineer Don Crain installed the external VSU boxes at each of the four tower bases and performed the due-diligence testing and system measurements in preparation for a MoM proof filed earlier this year.

The VSU also uses a high-voltage vacuum capacitor series network, but then employs a buffered ferrite step-up transformer to be able to accommodate lower-power systems that produce lower sampling voltages. King indicated the units perform to within ±2 percent magnitude and ±2 percent phase tolerance from –40 to +50 degrees C for temperature stability and up to 30 kV of peak voltage capability across the entire AM band.

Crain discovered that the self-impedances of the guyed towers were much higher than the self-supporters, so 40 pF of shunt capacitance was added to better normalize the tower base conditions for the array. He used Jerry Westberg's WCAP computer program to calculate the transformations and stray capacitances for accurate MoM modeling. The array survived direct lightning hits and extensive beacon light damage just before the NAB Show, but the KTL VSUs have since performed well without problems.

DESTRUCTION AND RECONSTRUCTION

Andy Skotdal, president and owner of KRKO in Everett, Wash., is a man who likes a tough challenge. His 11-year journey spent securing the required permits and then building — and rebuilding — his 50 kW station upgrade has been well documented.

Much of Skotdal's time, effort and finances during those 11 years were spent coping with a less-than-cooperative local government, very unfriendly neighbors and the attack of a self-described eco-terrorist that destroyed two of the station's four towers.

Skotdal offered an invaluable punch list of critical lessons learned and sage advice for anyone contemplating building or relocating an AM transmitter site and antenna array:

- File your building permits well before your FCC CPs, and expect four to eight years of processing.
- Coordinate a well-planned PR strategy to win over the community to counter opposition.
- Media can and will distort fact and truth to exacerbate and foment opposition.
- Budget adequately for the necessary legal defense and team of experts to support your effort.
- Control the clock as best you can and don't let bureaucrats stall the permit hearing process to give the opposition time to organize.
- Play an AM radio in the public hearing meetings to show how high noise is making AM radio reception very difficult.
- Don't give in to shorter towers or give up on full-sized or tall towers.
- Hire an attorney who has successfully sued tower manufacturers to make sure your tower company is worthy.
- Bent anchor bolts can be repaired; anti-terrorism nuts are effective.

Skotdal concluded by observing that "the proposed projects that never get built and are lost to opposition groups usually do not have a good PR plan, adequate community support or financial resources, or the will and perseverance to ultimately succeed."

Venerable WWVA in Wheeling, W.Va., lost all three of its original 420-foot, self-supporting Blaw-Knox towers last year in a freak windstorm.

GROUND NOBODY WANTS

Moving or building a new AM DA anywhere near a high-population area can be a daunting challenge in an age of aggressive NIMBYs, restrictive zoning laws and high real estate prices. A number of enterprising AM station owners have resorted to landfills as suitable sites for building AM antenna arrays.

The Bonneville Phoenix cluster offers a fine example of how to do it right. Director of Engineering Gary Smith shepherded the forced move of KMVP, a three-tower 1 kW DA-2 facility on 860 kHz to a city-owned managed landfill site next to Sheriff Joe Arpaio's prison southwest of downtown Phoenix.

Smith knew that getting city approval for his plan would require carefully executed political maneuvering. Making friends with the mayor and members of the city council, and reminding them how the Bonneville stations had been active community supporters and contributors for many years, were key tactics in that effort. The building permit would also require that there be no visual disturbance to the nearby protected Indian burial grounds.

Landfills inherently are unstable, collapsing about 10 percent every year as the fill settles and deadly methane gas is removed. A 60 mil, high-density polyethylene geo-membrane liner laid underneath the transmitter building provides the necessary gas barrier. Two Det-Tronics gas monitors are installed 18 inches below the building ceiling and above the building floor; they constantly monitor methane gas concentration and are tied into the fire alarm and remote control system. Existing vertically driven pipes collect the methane around the mile-by-half-mile site and route it to a common burn-off flare. Vegetative soil retention and dust control were required to manage erosion and drainage across the site.

All of these installed additions and precautions were required by the station's modifications to the city's Type 3 permit, granted by the Department of Environmental Quality. Core drilling, excavation or buried radials were not permitted, thus the guy anchor and tower bases were constructed on steel-reinforced concrete pads measuring 20 x 20 x 2 feet above the surface.

Smith said his total project construction costs were about 15 percent higher than a traditional site as a result; however there have been no increases in ongoing operational costs.

Tom McGinley is director of engineering and MIS for CBS Radio Seattle; he is technical adviser to Radio World and a longtime contributor.

Tieline Technology
Mic Adapter


Photo by Jim Peck

Tieline says its Report-IT Live codec app, released last year, has had thousands of downloads since last summer, but that some users asked for a way to take advantage of the full dynamic range of the iPhone's digital input.

So here's a professional hardware Mic Adapter that allows a newsie to attach a pro dynamic microphone to an iPhone 4 for newsgathering when using the Report-IT Live.

Another benefit: Newspeople who do field work want a "real" mic with a station flag, rather than a phone, if they're going to be holding anything under the nose of, say, Duchess Kate or President Obama.

The adapter fits in the palm and allows the iPhone to record audio or broadcast live using a dynamic mic and two sets of headphones or ear buds.

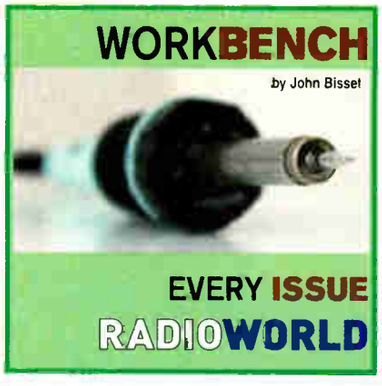
Many mic interfaces, says the company's Darren Levy, roll off quickly after 200 Hz. This one promises richer, warmer, low-frequency response.

Features include adjustable mic gain attenuation, auto gain control On/Off and stereo line-level input. It uses AAA batteries; it also has a mini-USB power input for iPhone charging during long broadcasts. It can also be used with other iPhone pro audio and audio/video apps.

Apple Accessory Certification is pending.

Shown: Mary Ann Seidler, Charlie Gawley, John Bisset and Darren Levy celebrate. Bisset, a Radio World contributor, does not participate in "Cool Stuff" judging.

Info: www.tieline.com



Omnia.11 Impresses LM Communications

USERREPORT

Radio Veteran Isn't Surprised Often, But Omnia.11 Opens His Ears

BY CHARLIE KENDALL
Chief Programming Officer
LM Communications

LEXINGTON, KY. — Because I've been in radio since shortly after Noah and the flood, LM Communications owner Lynn Martin calls on me for all things radio, including technical, for the 12-station chain.

After a couple of processor failures, Martin and I had a few conversations with Frank Foti, president of Omnia Audio, about processors. The next thing I knew, Frank and his comrade-in-arms Cornelius "Corny" Gould hopped in their car and drove down to Lexington from Cleveland.

Ironically, a favorite stop in the merry circus I call my life was my time in Cleveland at the Buzzard, WMMS(FM). It so happens that Omnia's Frank Foti is a Buzzard too. We Buzzards are a close-knit group. Just as there's no such thing as an ex-Marine, there are no ex-Buzzards.

GOES TO 11

We all know that the last Omnia processor was the Omnia-6, so how did we get to "11"? Frank quoted the line out of "Spinal Tap": It was going to be the Omnia 10 but they decided that it needed to go to 11.

The Omnia.11 is a game-changer. This is a full polevault over the competition — and it doesn't take weeks of tweaking to get it there.

Let's start with the fact that the thing has fold-back handles. I've carried processors, from a giant Gates tube limiter at WROX in 1964 to the Volumax at Eddie Fritts' WNLA(FM), through all the Cutting Edge, Orban and early Omnia models; not one of them had a handle. When it comes to transporting anything to and from a rack or sliding it in and out of one, it's nice to have a handle. Today, most often this is accomplished by one person and so a handle is a good thing.

It has a really big touch screen that is easy to read — and OMG! — an intuitive GUI.

The user interface on the Omnia.11 is the size of an iPad. No more putting on my reading glasses and getting out the magnifying glass to read a two-line display. I can read the Omnia.11 from across the room; and it's laid out so intuitively that you instantly know what's going on with your audio. The rear panel has every kind of input, output, optical and Internet connection you could ask for. And the Omnia.11 is priced competitively with other high-end processors.

We ran a demo unit on four stations with wildly differing formats. At each it took only a few minutes to drop in and customize the sound.

We started with our hot AC station, WCDA(FM) in Lexington. I have never been able to get a clean, "spatial" sound out of the old processor, and loudness has always been a problem even when we're pumping at the legal limit.

We plugged the Omnia.11 in on the stock hot AC setting and it was immediately the cleanest, loudest, biggest-sounding station in town. I put on the headphones; listened to the car stereo and listened on the men's room little mono speaker. It was the absolute best the station had ever sounded.

The last place we put it was on WLXO(FM), a classic country station for which LM Communications recently began providing programming consultation to its owner. Since it is older country music, quite a few of the songs are just plain mono and many of the "stereo" don't have a lot of stereo spread. Now, with Omnia.11 in the mix, the music wraps around you like a blanket. There is absolute sonic clarity throughout the spectrum and this little Class A sounds louder than the full Class C, with no square wave or pumping or artifacts of any kind.

When you have source material this diverse and don't realize it's a '50s song until you're a few bars in, that tells me that this box is doing something very different. The true beauty of the Omnia.11 is that it really doesn't have any "sound" of its own. It just makes everything sound better. I am not an engineer and I cannot tell you how the Omnia.11 does what it does. I can only tell you that I've been doing this for more than 40 years and this is the best processor I've ever heard. With this unit there is no longer any reason to sacrifice any level of fidelity for loudness.

Oh, and that demo unit is still in the rack and on the air (I wouldn't give it back). The rest of the ones I want are on order and I won't be happy until they are in all of our stations. The Omnia.11 is a "10."

For information, contact Omnia Audio in Ohio at (216) 241-7225 or visit www.omnia-audio.com.

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COOL STUFF AWARD RADIOWORLD 2011

DaySequerra Eclipse LBR4 Digital Radio Processor

Photo by Jim Peck

DaySequerra targets this four-stream AES stereo audio processor to digital broadcasters. Its purpose is to improve audio performance of low-bitrate HD Radio multicasts, DAB and DRM channels with a "particular focus" on stereo at 24 kbps.

The Eclipse uses DTS Neural Loudness Measurement technology to provide loudness measurements and new psychoacoustic processing with look-ahead gain correction to make audio level adjustments that are transparent to listeners. DaySequerra says the proprietary codec preprocessing engine has been "specially tuned" for operation at 24 kbps, 32 kbps, 48 kbps and 54 kbps bitrates to reduce artifacts from lossy codecs and low-bitrate transmission significantly.

David Day, left, and Mark Segle are shown.

Info: www.daysequerra.com

TECHUPDATES

JÜNGER UPDATES B46

Dynamics processing specialist Jünger Audio updated its B46 Level Magic digital dynamics audio processor by incorporating a Web interface that allows users to operate the unit remotely from a host computer.

The standalone B46 processor is a professional nondestructive normalizer that performs automated levelling of digital audio signals. The unit integrates Level Magic, Jünger Audio's adaptive loudness algorithm which is based on a multi-loop dynamic range control principle.

According to the company, this requires that slow changes (AGC), fast changes (transient processing) and look-ahead peak limiting are handled simultaneously, thus offering level management with high audio quality and without coloration, pumping, breathing, distortion or modulation effects.

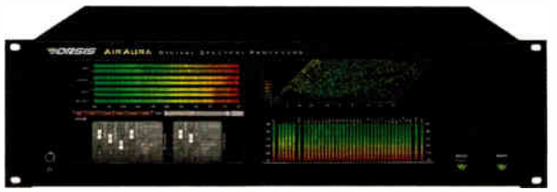
The unit remains one of most popular products due to its audio quality and its "set-and-forget" operation, Jünger Audio says. Alongside the Web interface, the company has redesigned the front panel and ensured that it is compliant with ATSC, ITU and EBU R128 loudness recommendation.

For information, contact Jünger Audio in Germany at 011-49-30 6-77721-0 or visit www.junger-audio.com.

WHEATSTONE HAS AN AURA

The Wheatstone/Vorsis flagship processor, the AirAura, is designed for a range of applications from analog FM to HD Radio duties.

The company says the AirAura, a "digital spectral processor," features proprietary final clipper technology that provides cleaner, clearer, more natural mid and high-end detail without smearing, dulling and other artifacts it says are often associated with managing the FM pre-emphasis curve.



Its multiband AGC/SST (Sweet Spot Technology) provides smooth gain and spectral control during varying incoming program levels. The AGC boasts separately adjustable low and high inter-band coupling algorithms for sonic sculpting. AirAura also offers the latest Vorsis Bass Management System (VBMS) with new Texture control for fine-tuning on-air bass.

Dual "widescreen" displays show detail about the processor's operation. In addition to real-time measurement of input, output and RMS (loudness) output levels, the metering shows all gain reduction activity. The AirAura has an onboard 1,024 point FFT analyzer and an oscilloscope.

AirAura accepts audio feeds from three kinds of sources: analog, AES3 or Wheatnet-IP. Each AirAura input may be configured for automatic failover in the event of an unplanned audio outage. Specialized analysis functions offer an overview of input or processed audio. AirAura is remote-controllable via Ethernet-based IP or an onboard 802.11G Wi-Fi wireless receiver.

For information, contact Wheatstone/Vorsis in North Carolina at (252) 638-7000 or visit www.vorsis.com.

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Orban Pumps Classical Station

Audition by Optimod 8600 Makes Engineer Change Plans

USERREPORT

BY MIKE BYRNES
Chief Engineer
WETA(FM) Radio

ARLINGTON, VA. — Doesn't it always figure?

By the time you submit a capital budget request and a PTFP grant application for a particular piece of equipment, an upgrade of that item is released — yet you can't buy the newest model because the Public Telecommunications Facility Program won't let you make a monetary change in a grant.

That's what happened to us last year. By the time we received our grant for an Orban Optimod-FM 8500, the 8600 already had hit the stores.

TIMELY BREAK

Fortunately Bill Sacks — formerly of Straight Wire Audio fame, and now running Optimod.fm and Optimod.am with his wife Kim — called me with a question: Did we want to play with an 8600 while he was having fun at the NAB Show?

We took him up on it immediately.

The new 8500 already was a significant upgrade for us. We've been running Optimod 8200s for many years; even after several refurbished models they still did a credible job on classical music. However, when we installed the 8500 using the factory "Classical 5-Band" preset we stepped up to more openness, better peak control, more apparent loudness without any apparent loss of dynamic range and a more listenable sound.

Phil Simon's earlier review of the 8500 sums it up very well (Radio World, March 30, 2005). Since WETA is playing in virtually every doctor's office within 40 miles, the increased listenability helps us, particularly during fundraisers.

After all that, we weren't sure how much more we could expect from the 8600; but the difference was apparent from the first.

The improved quality and openness of the sound in the high end (we are using the factory Classical 5-Band MX preset) was apparent immediately in A-B switching between the 8600 and 8500. To me this really is the main difference between the processors.

We're using the 8600 internal delay to feed our HD Radio exciter and the composite outputs to feed our analog exciters. I've always preferred the sound of the FM signal to that of the HD Radio anyway and I believe that the 8600 makes the analog sound better than the digital on a good tuner, such as the Sony XDR-F1HD.

My problem now is to figure out how to pay for the 8500-to-8600 upgrade.

For information, contact David Rusch at Orban in Arizona at (480) 403-8300 or visit www.orban.com.

ERI Inc.
1329Line

By eliminating the use of copper in the outer conductor of this transmission line, ERI reduces component prices (and you know how precious copper can be). By using aluminum instead, ERI also cuts down on weight, which simplifies support considerations.

The 1329Line is a family of rigid transmission lines with aluminum outer but copper inner conductors, available in 3-1/8-inch, 4-1/16-inch and 6-1/8-inch (both 50 and 75 ohm) sizes.

The bellows expansion compensator accommodates the differential expansion between the inner and outer conductor. Vertical and horizontal spring hangers are designed to support the system and compensate for differential expansion between the tower and vertical and horizontal runs.

The systems include galvanic adapters to allow interconnection to new or existing brass and copper components.

Tom Silliman of ERI shows off the display.

Info: www.eriinc.com

TECHUPDATE

FALCON 50 HAS SIX BANDS

The Falcon 50 six-band processor is, according to the company, the "flagship" processor of Italy's Axel Technology.

Included in the feature set are a stereo generator, stereo enhancer and bass enhancer. Additional features are a phase inverter, phase rotator and high-pass filter.

Internal processing is 24-bit/192 kHz. Included are 50 processing presets along with storage for 50 customized presets.

The Falcon 50 offers IP remote control. XLR, BNC, RS-232, 25-pin D-sub connections are available on the back plane, along with a USB port to accommodate analog and digital signals.

Dual LCD screens display navigation and performance. A minimized faceplate slave version is available.

For information, contact Axel Technology in Italy at 011-39-051-736555 or visit www.axeltechnology.com.

TECHUPDATES

AUDEMAT DIGIPLEXER MULTITASKS

The Digiplexer 2/4 from Audemat combines an audio processor with broadcast functions such as RDS encoding, stereo encoding, audio backup and I/O remote control.

According to the company, the Digiplexer 2/4 has impressed broadcasters who have tested it against major brands and favored it for its loudness, fidelity and overall performance.

The HQSound algorithm engine developed by Sound4 for Audemat offers on average 20 times more power than those commonly used in other products, the company says. So, with four bands and no other peripherals in front or behind it, HQSound can rival processing chains made up of several processors in series.

There are three versions of the Digiplexer 2/4 available.

A single-band unit designed for transmitter site operation combines the features of RDS encoding with a 1.5 MHz final limiter and automatic gain control on the audio processing side. The two-band version is suitable as a main processor for soft and medium formats and as a secondary processor at the transmitter site. The most powerful is the four-band version, promising outstanding audio performance for all station formats.

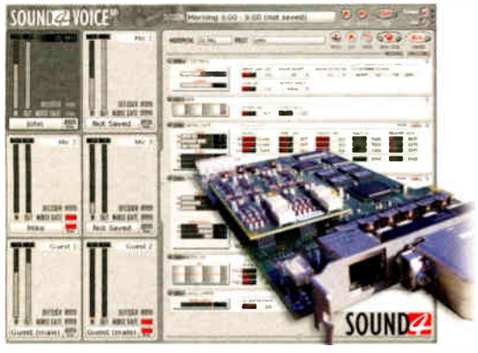
The Digiplexer 2/4 is part of Audemat's "Radio All in One" range which, by combining functions into a single unit, delivers savings in terms of money, rack-space and effort, according to the manufacturer. The Digiplexer 2/4 can be upgraded from single-band to two- or four-band option by means of simple software upgrade.

For information, contact Audemat/WorldCast Systems in Florida at (305) 249-3110 or visit www.audemat.com.

SOUND4 ADDS VOICE AD PROCESSOR-ON-A-CARD

The Sound4 Voice AD is a three-band, six-channel voice processor situated on a PCI Express computer card. It is intended for live radio audio. The Voice AD has analog/digital in and out.

The card uses SHARC DSPs with up to 8 gigaflops in processing power.



The company cites its HQSound technology 192 kHz processing chain with a three-band noise gate, an advanced de-esser, a three-band processor, a four-band parametric EQ and a brick-wall limiter for finalization. According to Sound4 its processing structure allows adaptability to all kinds of voices, with a result from natural to big and structured tones.

The dedicated graphical user interface monitors up to six microphone channels, status, settings and user's names. Recalling a mic to a user is done in two clicks. Sound4 offers "Session Recall," allowing recall of saved microphone settings along with loaded users presets in one click.

The Sound4 Voice AD has a new Network Preset Management tool for centralizing and distributing user presets on all Sound4 processors connected to a network. It can manage an unlimited number of users.

In Multi-Studio mode, Sound4 Voice AD can distribute these resources over several studios. Studios can save and recall their own sessions. The six microphones can be processed separately.

The unit also is available in an eight-channel Livewire version.

For information, contact Sound4 in France at 011-33-413-415-540 or visit www.sound4.biz.

Omnia Audio
Omnia.9 Audio Processor

The company promises "a completely new platform ... unlike anything ever offered within the Omnia family."

If last year's big Omnia processor was the offspring of Frank Foti and Cornelius Gould, this year's Omnia.9 is birthed from the mind of Leif Claesson. Foti anticipates big things for Gould and Claesson, calling them "the next leaders in audio processing."

Notable features include "undo" technology, a source declipping algorithm and a program-adaptive multiband expander that removes distortion from source material to correct damage done in mastering.

Photo by Ian Peck

"Undo actually fixes the over-processed CDs so common in today's contemporary music," Omnia states. "A Psychoacoustic Composite Embedder allows up to 140 percent audio peaks in stereo, within 100 percent total modulation, creating up to 3 dB extra treble headroom."

The box has selectable patch points so users can audition an audio signal from anywhere in the chain without affecting program output. There's separate processing for FM and HD1 (and, optionally, HD2 and HD3 paths); and independent encoding and processing for Internet streams of FM analog and HD channels, with the ability to encode to numerous formats. The unit comes with an onboard RDS encoder and HTTP push support for automation systems that can use dynamic RDS and streaming song titles.

Claesson gives Foti a lift while Paul McLane of Radio World and Angi Roberson of Omnia watch.

Info: www.omniaaudio.com/9/

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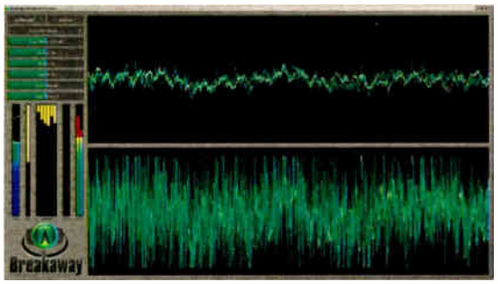
TECHUPDATES

CLAESSON EDWARDS GOES SOFT



According to Claesson Edwards Audio, its Breakaway Broadcast Processor software turns an ordinary Windows PC with a decent sound card into a full-featured broadcast processor.

Available in standard and ASIO versions, BBP is aimed at keeping an FM, AM, HD Radio or streaming station compliant, consistent, loud and clean.

The company says that BBP has a "mathematically perfect" MPX stereo generator and allows any 192 kHz-capable sound card to be connected to the composite input of an exciter, for the cleanest possible audio path. In low-latency mode (ASIO version only), microphone-to-airwave delay is 17 milliseconds, low enough for talent off-air monitoring.

BBP uses a wideband AGC for unobtrusive gain-riding and four to seven bands compression/limiting depending on the selected preset.

Final peak control is done with a highly oversampled, psychoacoustically distortion masking clipper, for particularly clean audio even with several dBs of clipping, without HF limiters or excessive compression. Audio bandwidth is adjustable from 4.5 kHz to 17.5 kHz. BBP has a built-in signal generator. Tilt/Asymmetry/PEQ is adjustable, to calibrate for AM transmitters.

The company plans a series of upgrades, some of which will be free to legacy clients. A free trial version is available at the website.

For information, contact Claesson Edwards Audio in California at www.ceaudio.com.

INOVONICS SLINGS A NEW DAVID

Inovonics introduced a new digital broadcast processor at this year's NAB Show. It says David IV is a comprehensive FM and HD Radio audio processor with user-friendly features, new processing algorithms and a dynamic major-market sound.

The chassis features dedicated metering, a large-format LCD interface and jog wheel access to all features and controls. Multiple ins/outs for composite, analog and digital audio are included; an IP port provides remote access and easy preset sharing. The DSP-based design includes intelligent gain-riding AGC, phase-coherent five-band compression for wide-range "signature" equalization and dedicated sub-bass "punch" and "rumble" augmentation. A dual-section stereo-enhancement feature expands the soundstage for stereo and center-channel solo sources.

According to Inovonics, its proprietary PIPP peak limiter ensures full carrier deviation even with problematic program audio, and gives the user direct control over the average/peak ratio. Adaptive pre-emphasis is coupled with distortion-cancelling clipping to preserve program brightness and clarity, despite the power bandwidth limitations of analog FM. The digital stereo encoder portion has two independent composite/multiplex outputs, calibrated composite clipping and self-metered RDS combining.

The company says this iteration of the David family (as in David vs. Goliath) was designed with accessibility and ease of use. It comes with presets for popular formats and custom profiles that can be saved or exported. It also boasts a "green" profile, emitting virtually no heat and drawing a slim 8 watts of power. It boots or resets in less than 1 second.

The David IV is expected to ship in the third quarter.

For information, contact Inovonics in California at (800) 733-0552 or visit www.inovon.com.

OPTIMOD UPGRADES AVAILABLE

Bill and Kim Sacks offer factory-authorized refurbishing, updating and upgrading of legacy analog Optimods, particularly 8100 and 9100 models. They also sell new Optimods and offer support and service.

The Sacks say they consider the 8100 FM and 9100 AM Optimods the pinnacle of analog broadcast processing, the most competent analog audio processors made. A refurbished 8000 is cherished for its invisibility and purity on fine arts formats

The genius of Bob Orban's design is even more audible, they say, once the machines are fortified with modern low-distortion op amps, new-generation film dielectric power supply improvements with better bypass caps, and the use of high-fidelity audio coupling capacitors. The result is a smoother, open and transparent sound. "We always preserve the original Orban character and polish," according to Bill Sacks.

The Sacks also offer a proprietary XT bass EQ modification, a $250 revision upgrade that provides two separate pure L+R bass controls at two frequencies. The existing separate left and right bass EQ controls can produce undesirable exaggerated L-R low frequency information caused by imprecise balance of the two bass controls when adjusting LF EQ on the fly, they say.

The upgrade eliminates LF EQ imbalances and any need to re-null the low-frequency L–R with a tone to prevent unnecessary low-frequency L–R modulation and its attendant potential intermodulation distortion of the 38 kHz subcarrier each time the EQ is adjusted — thus permitting on-the-fly tuning.

For information, contact Bill Sacks, CPBE, in Maryland at (301) 880-7109 or visit www.optimod.fm.

Wheatstone Corp.
IP-88VE Audio Processing Blade

Photo by Jim Peck

"VE" is for Versis Embedded. Audio processing meets networked digital audio technology in the IP-88VE, where eight three-band stereo audio processors are built into one rack space for use in a WheatNet-IP Intelligent Network.

Each processing chain consists of a four-band parametric equalizer followed by a crossover and three bands of compression. The compressors each feed their own limiters; their outputs are fed to a broadband look-ahead limiter for peak control. The Blade has its own local I/O, with eight stereo pairs of AES Digital audio in and out, and can function as a standalone processing engine.

Blades can configure themselves as part of a new or existing WheatNet-IP Intelligent Network; thus the processing power becomes available throughout that network.

The IP-88VE is configured and controlled over Ethernet using a laptop or desktop computer. GUI Lite software is included for setup; power users can order optional GUI Pro, for access to individual processing parameters.

A routing matrix and routing control interface are included, as are two eight-channel stereo utility mixers that can be controlled by WheatNet-IP Navigator software or the new Sideboard control surface.

Steve Dove, left, and Mike Erickson are shown configuring themselves dynamically.

Info: www.wheatstone-radio.com

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Looking for radio employment on-air or in a support position behind the scene. Experienced in board operation, production and copywriting. Reliable fast learner. Rodney, 918-409-4450 or top2botclean@yahoo.com.

Recent radio school graduate. Enthusiastic, motivated and dependable. Looking for on air, or support position. Willing learner and eager to start. Ronnie, 479-420-3668 or ronnie.newton2@gmail.com.

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Low-Power Radio Takes Many Forms

What I've Learned So Far About the Part 15 Radio Community

BY BILL DEFELICE

My first dabbling in low-power "broadcasting" occurred in childhood. A Radio Shack P-Box kit, namely a wireless AM microphone, was the start. The study of electronics and my work at a community radio station as a teen soon would benefit my pursuits in the world of commercial broadcast engineering.

Fast-forward two and a half decades. Now a former station chief, I put my talents to use for a local school district. A high school in the district planned a major renovation. Among many additions were suites not only for a television media center but for a two-studio radio station. A familiar problem emerged: The space had been designed and created with no thought on how to equip it for its intended purpose.

Little did I know that this former chief engineer's renewed interest in low-power broadcasting would be kindled by this project.

LOCAL, REALLY LOCAL

With little district funding available, it was up to me to figure a way to build a radio station that would provide students with a real-world, hands-on broadcasting experience. With few affordable alternatives, it appeared I would have to opt for a solution in which broadcasting was limited to campus grounds.

Bill DeFelice, right, is shown in studio with students Anna Rae Newland and John Charles Moritz at Brien McMahon High School in Norwalk, Conn. Students named the station 'McMahon FM.'

I researched the various methods available for low-power radio and found some information online; but much of it lacked specifics regarding campus-limited broadcasting within the confines of the Part 15 regulations. This is what inspired me to develop HobbyBroadcaster.net, which serves as an information hub into which I also merged sister sites CampusBroadcaster.net and BusinessBroadcaster.net.

HobbyBroadcaster.net serves as a Part 15 radio reference for three target audiences: educational institutions, specialty business applications as well as the electronics and radio enthusiast.

My research pretty much nailed down the only practical options worth considering for this project. Carrier current allows the injection on an AM signal into the AC power lines within the building. After performing some low-power scale testing, I decided against this. Most kids accustomed to listening to radio would favor FM for music and entertainment, so I opted for installing a radiating coax FM system.

I had procured a small supply of radiating coax from LPB Inc. before that company went out of business. Now I suspended the cable in the ceiling at the center the main school building and fed it with an adjustable 5-watt transmitter.

While I was designing the campus FM installation, the former LPB technical team suggested the use of radiating cable along with a measurement point of 3 meters from the exterior walls of the building. Working within these confines allowed a useable signal within a good distance of the coaxial cable, though I'll need to extend the run to improve coverage in the outer reaches of the building.

In addition to the FM, I decided on a free-radiating AM transmitter operating under Part 15.221(b)(2), a rule specific to on-campus installations. This would provide a solid signal around the campus, though building penetration is less than optimal.

With the assistance of a couple of local broadcast engineers I was able to confirm and document the field strength of each system using a Potomac FIM-41 for the AM and an FIM-71 for the FM.

BROAD INTEREST

In the time I've operated my low-power radio resource site, I've seen demand for Part 15 radio take on many different forms.

The repeating message transmitters

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READER'S FORUM

THE PRIME DIRECTIVE

Tom Osenkowsky wrote a while back in Radio World about interference. Maybe somebody could start a Web page about this topic.

I can give several examples.

About 1960, interference was reported to reception in ambulances in the downtown Rochester, N.Y., area. The interference was determined to be a combination of the signals of two Rochester FM stations and a paging service. The two FM frequencies were 4 MHz apart, and the paging service was 4 MHz from the ambulance frequency.

One day somebody noticed that the amount of interference seemed to change with the position of a weather vane belonging to the city of Rochester's smoke abatement program, located near one of the FM antennas.

Eventually the weather vane blew down, and the interference disappeared.

In 1984, when I moved to Laredo, Texas, I noticed several spurs in the FM band. One day the interference had disappeared. I called the chief engineer of one of the TV stations and asked if anything had changed.

"They are working on the roof."

"What kind of roof is it?"

"Metal."

Apparently there had been a corroded contact between metal pieces on the roof. Problem solved.

More recently, interference was noticed to reception of a communication service near Yuma, Ariz. It appeared to be caused by a combination of an FM signal and a TV signal. Somebody realized that shaking one of the FM guy wires changed the level of interference. That guy wire was near the FM antenna, but this was not obvious from the ground. Moving the antenna to a different leg on the tower eliminated the interference.

I know of a case in south Texas in which a spur appears in the FM band caused by two FM stations on the same tower. The problem is probably something on the tower or something in or near the transmitter building. Any volunteers to find this one?

Stan Swanson
KYRM(FM)
Laredo, Texas

Tom Osenkowsky replies:

Stan, thank you for your stories. Interference is many times caused by passive objects such as two or more pieces of metal, fences, rain gutters and everyday objects that are illuminated with sufficient RF from one or more sources.

In your last example, it can also be caused by RF ingress from one station's antenna to the final amplifier of another station causing unwanted mixing products. In such cases, filtering is required to eliminate the problem.

It would certainly make good reading, a web page or book dedicated to such tales. There would be many, and each solution is often unique onto itself.

As in many cases, fixing the problem is simple. Finding it is the hard part! A spectrum analyzer and patience are valuable tools.

CORRECTION

A product news item in the May 18 issue gave the wrong web address for Symetrix. It is **www.symetrix.co** (not ".com").

LOW POWER

(continued from page 45)

used as talking signage by real estate agents are a popular application for low-power AM broadcasting using free-radiating antennas. Several manufacturers offer AM transmitters certified under Part 15 that high schools, colleges and universities have used successfully for campus-limited broadcasting.

Some users choose to go with a kit transmitter, with varying degrees of success. In my experience, kits vary in quality and sometimes it's difficult to obtain sufficient performance.

Part 15 AM operation with an intentional radiator is regulated by field strength (see the rules, Part 15.209); or you can use a fixed-length radiator and ground, with limited final amplifier input power (15.219).

Some educational institutions still use carrier-current AM, lessening the chance of radiating off their property. On more spacious campuses with multiple buildings, carrier current becomes more expensive. Usually the typical solution consists of additional transmitters or a distribution network with booster amplifiers to service these buildings. Part 15.221 deals with specifics regarding AM carrier current.

Free-radiating Part 15 FM is much less popular. It is nowhere near as generous in providing area coverage. I have seen it used in smaller targeted areas such as health club and sport bar entertainment system installations. I have also seen it used in some houses of worship to provide assistance to the hard of hearing.

Many of my website visitors shared why they wanted to explore this option in broadcasting.

Some are simply frustrated with the roadblocks of trying to build a licensed LPFM. Others feel their local broadcast outlets are providing community service that is less than adequate. High schools, colleges and universities aren't alone in the desire to broadcast as businesses scrutinize other potential methods to reach out to potential customers.

HobbyBroadcaster.net serves as a Part 15 radio reference for educational institutions, specialty business applications and the electronics and radio enthusiast.

Under Part 15.239, operation on the FM band is limited by field strength, specifically 250 μV per meter at 3 meters. Usable coverage is limited but can be increased slightly by reverting to mono transmission.

I have seen businesses use low-power AM or FM to target visitors in parking areas and drive-through lanes.

Those who wish to explore the world of low-power broadcasting under Part 15 probably will want to avoid FM; a well-engineered AM installation would provide markedly better coverage.

This is just a small sampling of those who have explored the world of legal, low-power, license-free Part 15 radio.

Share your own experiences with Part 15 broadcasting. Write to radioworld@nbmedia.com.

The author is former chief engineer of WMMM(AM)/WCFS(AM) in Westport, Conn., and Webmaster of the site History of Westport Connecticut Radio. His Part 15 site is hobbybroadcaster.net.

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It's not often that management and engineering are in total agreement. It's even more unusual when the top dog is a CPA who is the GM AND the CFO. That's Richard T. Morena, Principal of Press Communications, LLC. He and George M. Kowal, his Assistant Chief Engineer, see eye to eye (or ear to ear) when it comes to their on-air sound. Press Communications, LLC is located in Arbitron Market #51 and broadcasts on the simulcast 106.3FM/106.5FM (THUNDER 106) from Atlantic City to NYC. That's why they've got a pair of Vorsis AirAura processors taking care of business at THUNDER 106.

"Sure, WE can hear the difference immediately. But when our LISTENERS call to tell us how great we sound, we know we're onto something big. With the AirAura, THUNDER sounds more thunderous and THAT is something that really shakes up our bottom line," says Richard Morena. "We LIKE that!"

Exclusive Vorsis AirAura® Audio Processing Technology:

+ AirAura Distortion-Managed Final Clipper
+ Fine Grain Processing
+ Sweet Spot Technology
+ Vorsis Bass Management System - v2.0
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