NPR STEPS UP MULTI-CHANNEL PUSH. Page 16

Radio Co-op
Not part of a radio group? That doesn't mean you can't organize your buying.
Page 12

Scott Moves On
Automation and programming veteran closes another chapter.
Page 24

Radio World
$2.50 The Newspaper for Radio Managers and Engineers February 16, 2005

INSIDE

NEWS & HD RADIO

ENGINEERING

ONE IN THE HAND

OPINION

In This Issue

Radio Groups Speed Up Their Digital Conversion

Sign New Licensing Deals With Ibiquity; Discuss Plans to Promote HD Radio

by Leslie Stimson

LAS VEGAS Twenty-one groups are speeding their transitions to digital, including owners that had previously announced plans to convert the bulk of their stations.

Broadcasters' efforts to promote the technology also are picking up; executives for radio owners are talking to Ibiquity Digital about buying receivers for giveaways and other promotional efforts.

Ibiquity apparently has reached updated agreements with broadcast clients — although it declined to discuss specifics — after what President/CEO Bob Struble characterized as "a very long, long, long negotiation and effort." The contracts include an incentive for groups that accelerate conversions to the first half of this year.

See PROMOTION, page 8 ▶

NEWS ANALYSIS

Powell's FCC Focused on Indecency, Ownership

by Leslie Stimson

WASHINGTON Media ownership, indecency and new technology.

These issues are associated with outgoing FCC Chairman Michael Powell and are likely to be his legacy, according to lobbyists, communications attorneys and engineers who spoke with Radio World.

These are also the broadcast-related issues a new chairman will face.

Both Powell and Ken Ferree, whom Powell appointed as Media Bureau Chief when he reorganized the commission in 2001, plan to leave the agency next month. Ferree's resignation gives the next chairman a chance to fill a key position.

A successor to Powell had not been named as of late January. Several sources predicted one of the Powell's fellow Republican commissioners, Kevin Martin or Kathleen Abernathy, might be appointed as acting chairman or chairman. After the announcements, Abernathy denied

See POWELL, page 22 ▶

◆ NEWSWATCH ◆

CEA: Satellite Radio To Push Auto Revenues

LAS VEGAS For the first time in a decade, the consumer electronics industry is looking at double-digit growth, according to the Consumer Electronics Association. It announced factory sales for 2004 and made predictions about this year.

The trade group says the CE industry should reap approximately $127 billion in sales in '05.

As 2004 came to a close, shipment revenues were poised to hit $115.4 billion, representing an 11 percent rise over 2003 at $102.6 billion.

The growth of portable MP3 players and aftermarket autosound products helped boost audio sales.

Satellite radio and vehicle navigation systems helped propel the aftermarket autosound category. CEA says these are categories to watch in 2005.

The association credits satellite radio for helping to push autosound revenues up 10 percent in 2004. Aftermarket autosound revenues were estimated at $2.21 billion and projected to be about $2.22 billion in 2005.

Factory installed autosound product sales were estimated at $3.5 billion in 2004 and projected to be $3.8 billion in 2005.

Audio cassettes sales continue to decline at $66 million in sales for 2004, down from $77 million the previous year. CEA projects cassette sales to drop to $50 million in 2005.

Harris Adds Unit; Cuts Workers

The creation of a new business unit within the Broadcast Communications Division of Harris gives some insight into how the company will be positioning itself in coming months. The new unit will focus on software systems and, Harris says, help it absorb Encoda Systems, which it bought last fall.

Separately, the company laid off some workers in Quincy, Ill.

John Sorensen, former CEO of Encoda, is president of the new unit, which Harris will use to offer content delivery systems. The move targets broadcast as well as cable, satellite service providers, ad agencies, media rep firms and other businesses.

Software Systems becomes the fifth business unit of Harris Broadcast Communications; the others are Radio Broadcast Systems, Television Broadcast Systems, Networking and Government Solutions and Broadcast Systems Europe.

The company also recently laid off 22 employees at its Quincy, Ill. plant, citing new manufacturing efficiencies. Harris reportedly had employed about 400 in Quincy.

Last summer the company had cut its broadcast workforce 5 percent.

Former DOE Heads Klotz U.S. Division

MUNICH, Germany Klotz Digital has put a new name on its U.S. subsidiary and named a new president — its former director of engineering — under what it called a strategic reorientation.

Klotz Digital America Inc. becomes Klotz Digital Audio Systems Inc. The offices remain in Norcross, Ga. The parent company is headquartered in Germany.

In a statement, CEO Thomas Klotz said U.S. business operations "have been rearranged in an effort to better adapt to market requirements." The firm said it "will put a stronger focus on the radio broadcast sector to remain viable in today's rapidly changing market."

Karl Schoning, who has been with the company for seven years, was named president of Klotz Digital Audio Systems. He is a former broadcast systems consultant.

Index

NRSC Debates AM Bandwidth, Surround

by Leslie Stimson

National Radio Systems Committee members believe they are nearing the end of the process for setting an HD Radio standard, dubbed NRSC-5.

Milford Smith, co-chairman of the DAB Subcommittee, believes the group is on track to approve the standard at its meeting at the spring NAB show. The NAB and Consumer Electronics Association, sponsors of the standards body, presumably then would deliver the standard to the FCC so the commission can complete its authorizations for the digital technology.

Tasks at hand

Members of the NRSC now are turning their attention to several hot issues that involve HD Radio: surround sound, AM bandwidth reduction and supplemental audio.

The first two are controversial and are being handled by "task groups" that have no standards-setting authority, sources said.

In fact, NAB asked that the AM bandwidth group be downgraded from a working group of the AM Subcommittee to make clear that the group is gathering information only at this time. Engineering sources surmised the trade group had been receiving some "pushback" on the issue from members that don't intend to go digital and who believe reducing AM bandwidth makes the audio sound worse, not better.

The group was formed after Clear Channel announced it would reduce bandwidth to 5 kHz on its non-music intensive AMs and 6 kHz for music AMs, in an effort to decrease interference. It suggested other groups consider doing so, and some have.

IBOC implementation also requires AMs to reduce their audio bandwidth to 5 kHz in order to implement that technology properly.

However, several NRSC sources characterized the issue as "political" and "controversial" because some executives and engineers at facilities that don't plan to go IBOC believe the change would not reduce interference.

The NRSC is looking at the issue but has decided it needs more information to make a decision about possible standard-setting. The task group will test 31 receivers to check the audio frequency response including auto, home and portable radios. "We're looking at a lot of receivers. We're going to see what they're capable of," Smith said.

NRSC Chairman Charlie Morgan said, "We want a comprehensive evaluation of the receiver population that exists today." He said the test plan, still being worked out, is likely to include objective and subjective testing. When testing would begin is undetermined.

Omnia President Frank Foti and NPR Senior Technologist John Kean co-chair the receiver task group.

Also being debated is whether the group should pursue a standard for surround sound for HD Radio or let the marketplace choose. Members have formed a task group to investigate four surround sound systems proposed for use with HD Radio. The systems are being advanced by several companies and alliances, including SRS, Neural/Harris, Fraunhofer/Telos and Coding Technologies/Orban.

Morgan and Smith stressed the NRSC is only gathering information and not setting a standard at this time.

The NRSC could opt not to set a standard for surround radio, they said. Undetermined is what members might do with the collected information after it is reviewed.

Privately, some members of the NRSC have told Radio World they believe the industry should agree on a surround sound technology for HD Radio. One source summarized this school of thought by saying, "Let's decide what our role is, or it will be decided for us."

Morgan said, "We don't know and that's why we're investigating. This is preliminary."

Other members see no urgency in the surround sound discussions; these say a "bake-off" among competing systems, as several characterized it, would be unnecessary. Receiver manufacturers seem more focused on implementing the basic HD Radio technology into their product lines, they said.

One radio observer went further:

"Ford and GM are not going to change the surround system they're building into cars, and have been for years, because the NRSC says something. That's not going to happen."

A third task group has been formed to look into how multiple digital channels might be labeled on future HD Radio receivers. Jeff Littlejohn, executive vice president of distribution development for Clear Channel Radio, and Jeffrey Marrah, technical fellow and RF design manager for Delphi, will co-chair the supplemental audio task group.

Digital Radio Product Offerings to Grow

More HD Radios, Including In-Dash Car Models, Are Due Out This Year

by Leslie Stimson

The marketplace will see more HD Radios in stores this year, lower prices for those products and — for the first time — terrestrial digital radios in cars. That's the prediction from receiver manufacturers and Ibiquity Digital.

In 2004, three receiver manufacturers — Kenwood, Panasonic and JVC — shipped HD Radios to retailers in the category of aftermarket auto sound.

This year, expect to see 15 to 20 terrestrial digital radios from more manufacturers and in more categories including home, tabletop and OEM. The average price should drop from an average of $800 to roughly $500 per unit, says Ibiquity President/CEO Robert Struble.

This fall, HD Radios will be in one or two in-dash brands as OEM equipment, he said. Contractually, he couldn't reveal who those automakers were, but an astute observer might take a clue from automakers that had cars in Ibiquity's booth at CES: BMW and Toyota.

BMW commits to HD Radio

BMW plans to include HD Radios in its vehicles as OEM equipment. On the show floor, BMW had a prototype receiver in the dash of a 5 Series vehicle. The automaker plans to have HD Radios installed in at least some vehicles for the U.S. market.

Photo by Leslie Stimson

A demonstration Boston Acoustics Radio shows supplemental information from KBMW(FM).

The automaker is still working out which models would include the digital radios. BMW has offered Sirius radios since December 2003, said Dr. Michael Webber, an engineer responsible for

See RADIOS, page 5 ▶

It's a Big Deal; Let's Say So

Now comes the big push.

As you'll read in Leslie Stimson's coverage of events in consumer electronics, digital radio's backers are changing their emphasis from technological development to marketing.

Ibiquity has Don Kelly and Dan Mason visiting stations to talk about how to market HD Radio. It has hired Bernie Sapienza to work the distribution channels and help retailers promote the hardware. Meanwhile, NPR is talking about a purchase of thousands of receivers to help kick-start things. We can expect announcements along this line from commercial radio in the coming year.

I'm glad. I have long felt that Ibiquity's efforts in marketing fell short of its technological successes, that it was counting too much on broadcasters to get the word out on their own, and not do more of the spadework itself. So to see Ibiquity taking a more active role in the marketing feels like progress.

Stimson wrote this in her CES cover story: *"Struble believes the radio groups are going to put together 'a massive campaign. The industry has to make an effort to at least do what the satellite guys are doing.' The satcasters spend $100 million a year on promotion that includes national TV, he said.*

"'This will be a different sort of campaign, more grass roots-based, more directly local. But I think the mouthpiece, collectively, of the industry is so great that if the gang gets together to do this ... it's going to have a huge impact."

Neither radio nor Ibiquity should shortchange that effort. Digital radio's backers should aim high.

Unfortunately, I'm pessimistic.

Now, I absolutely agree with Struble's point. Further, why *shouldn't* radio's digital rollout be a nationally coordinated big deal as well as a local one? Radio is made up of local stations; but our industry's problems and solutions are national in scope.

The success of the satellite companies at generating "buzz" should teach us something: As fickle as investors and consumers can be — and financial people have been plenty critical of radio — that same volatility can be a boon. If our industry succeeds at informing the market of why and how radio is better, public perceptions and consumer trends can change, and quickly.

But my experience has been that radio too often thinks tiny. It lets others define it. On the technology side, our track record of promoting substantial innovation isn't great.

Yet radio is doing a good job right now of generating awareness in campaigns like "Less Is More" and "Radio. You Hear It Here First." And the medium indeed has a story to tell. More live content and better variety. Shorter spots. Analog and digital data services. Real localism. The product is getting better. It's a long way from perfect, but we've seen improvement.

The lesson of recent years is that traditional radio should *program* locally, but *market* nationally.

Radio needs to think big, to invest further in a master campaign to bring these many threads together. I think many owners now understand this. But I don't want to see the digital piece of the promotional puzzle underrepresented.

The appearance of digital radio in the consumer marketplace at the same time as these initiatives presents a unique opportunity to reposition radio as a dynamic and promising medium.

So I say to Ibiquity and the groups who plan to promote HD Radio this year: Think big. Get NAB involved. The campaign to promote HD Radio can and should meld into the initiatives we see elsewhere to help radio get its groove back.

It may cost money to market better radio on a grand scale. But $100 million would be only about one-half of 1 percent of radio's annual revenue. Why not?

The benefits will be huge. Make a splash.

★ ★ ★

Imagine yourself sitting down to shoot the breeze over beers with an eloquent, Irish New Yorker to talk about radio, indecency, politics, terrorism, baseball, God.

Surround All Around

The events around surround for radio are not news to RW readers, who've been following this story for some time. Need a review? Here are selected stories archived on RW Online. Go to *www.rwonline.com* and click on the "Surround Sound for Radio" tab to read them:

"Is Radio Really Surround-Sound Bound?": Skip Pizzi discusses the options and history of surround in a series of articles that continues in the current issue. (Feb. 2 issue)

"Digital Radio, Surrounded": More on the roots of surround from Skip. (Jan. 19)

"5.1 or 2.0 Channels: Why Not Both"?: Mike Pappas, squarely in the middle of the surround debate, comments here about the best approach. (Jan. 5)

"NPR Goes 5.1 for New Year's Eve Broadcast": Our Leslie Stimson was the only journalist in attendance at NPR in Washington for the Dec. 31 broadcast. (Dec. 31, 2004)

"HDC Surround Will Drive HD Radio": Commentary by David Frerichs of Coding Technologies. (Dec. 1, 2004)

"KUVO Has 5.1 Ready, 'in the Vault'": My discussion with Mike Pappas about KUVO(FM)'s Colorado Symphony Orchestra concert with Dianne Reeves. (Nov. 17, 2004)

"Surround Sound Demystified": Dave Casey, at the time an Infinity engineer, wrote for us about the various systems pushing for surround. (Sept. 1, 2004)

"Surround: HD Radio's Wow Factor?": Steve Church of Telos Systems wrote in an opinion piece that 5.1 Surround Sound for radio is an imminent and welcome change. (June 16, 2004)

From the Editor

Paul J. McLane

Imagine further that your friend has a broad, welcoming face, a shock of white hair and an easy smile; that he has run a radio operation for years and years; and that he has met just about anyone worth knowing in a dozen fields of endeavor.

That's pretty much what it's like to talk to Bill O'Shaughnessy. And if you can't make time to visit this voluble broadcaster in Westchester County, N.Y., you can grab his third book, "More Riffs, Rants and Raves," published in 2004. It's a hefty 780-pager, listing for $35 and available for less recently via online retailers. The royalties go to the deserving Broadcasters Foundation of America.

If you've read his tomes, you know what to expect. There are interviews with newsmakers and celebs from Nelson Rockefeller and John Lindsay to Pete Hamill and Kitty Carlisle Hart. There are tributes and editorials about publishers, journalists, rich people and townies. As always, there is plenty of wisdom from former Gov. Mario Cuomo, whom O'Shaughnessy loves to quote and for whom he chaired Republicans for Cuomo.

Radio insiders will appreciate O'Shaughnessy's commentaries about the likes of Opie & Anthony, Sol Taishoff, 9/11 coverage, the First Amendment, media consolidation and the case of WFUV vs. the Botanical Garden. His book also includes a list of "high- and low-class saloons and favorite watering holes." What more could you ask for from a drinking buddy?

But the book, like O'Shaughnessy, is about people at its heart. It is published by Fordham University Press with ISBN 0823223361.

Radios

▶ Continued from page 3

development for the automaker.

He told Radio World the attractions of HD Radio for BMW are improved sound quality, combined with the promise of a digital data delivery pipe into the vehicle. "With digital, we can broadcast traffic data into the car easy and fast. The only data pipe we have now is analog RDS."

RDS can deliver data into the car with a speed of about 100 bits per second, while HD Radio has the capability of delivering the data at speeds of 1,000 to 2,000 or more bps, said Webber. Higher speeds translates into more traffic data with better resolution, the automaker believes.

He would not reveal which receiver manufacturer would make the HD Radios for BMW.

BMW eventually plans to offer HD Radios as options for all of its U.S. vehicles, Webber said.

The automaker is also looking at Digital Radio Mondiale as an AM solution for its European autos.

More HD Radios

Displayed at CES were the first HD Radio car products from Alpine, Eclipse and Jensen. Alpine showed an in-dash DVD receiver that features an integrated HD Radio tuner. It's satellite-ready and iPod-ready for expected summer delivery, according to the company.

Eclipse has an outboard HD Radio tuner module with which all head units would be compatible, to ship in February. Jensen also planned to introduce a CD receiver with separate HD Radio tuner module.

Panasonic is on its second generation of HD Radio products, introducing an HD Radio unit that receives XM Satellite signals also. This CD receiver has HD Radio capability integrated into the head unit. March shipment was expected.

Kenwood is working on new HD Radio product and was said to have an integrated HD Radio in the works, a source close to the company said.

Visteon, which announced two years ago that an unnamed European automaker planned to include HD Radios in the dash, says the unit goes into production this year.

Delphi expects to offer an aftermarket HD Radio in the future, possibly by 2006.

Audio Design Associates and Boston Acoustics plan to release home HD Radios this spring. ADA plans to release an IBOC module that plugs into its Tune Suite, designed for multi-zone listening. The product can be configured for four zones and can include AM/FM analog, HD Radio, weather band and XM.

Boston Acoustics is offering a previously announced tabletop model with multi-channel receive capabilities. It was announced at the fall NAB Radio Show; the company displayed prototypes at CES.

Toko Certification Center

Trying to speed time to market for HD Radios from Asian-based manufacturers, Ibiquity Digital and Toko Inc., which makes tuner decoder modules for HD Radio, will open an international HD Radio certification center at the Toko facility in Japan. The center will provide technical support and product certification services for licensed HD Radio consumer electronics partners.

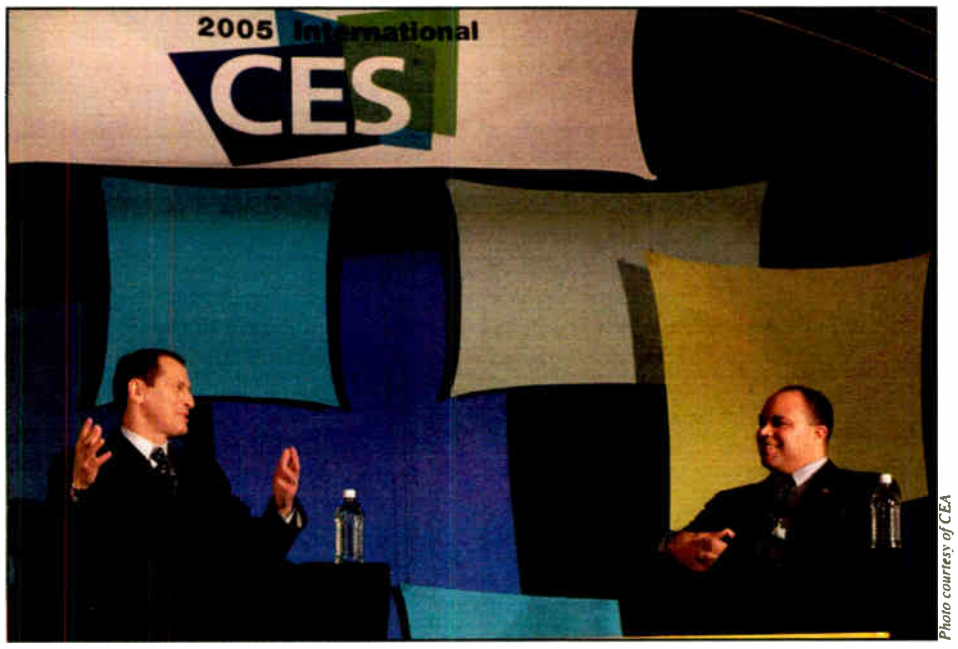


Photo courtesy of CEA

CEA President/CEO Gary Shapiro and FCC Chairman Michael Powell engage in a one-on-one about consumer electronics issues. Powell subsequently announced plans to leave the commission.

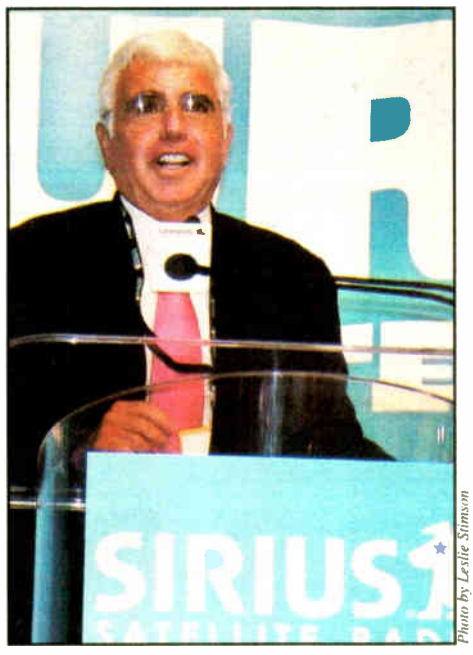


Photo by Leslie Stimson

Mel Karmazin spoke for the first time at CES in his new role as head of Sirius Satellite Radio.

Engineers from Toko will test and evaluate HD Radio products according to the same criteria used at Ibiquity's certification facility in Maryland. The data will be aggregated and provided to Ibiquity for certification of the product or device.

There was some station hardware news out of CES as well.

DaySequerra, a subsidiary of ATI-Audio Technologies Inc., has introduced three HD Radio broadcast tuners, as reported in Radio World earlier. The units were to begin shipping to radio stations

Photo by Leslie Stimson

Ibiquity demonstrated real-time traffic broadcast from KSTJ(FM) using HD Radio and displayed on the navigation system in this Toyota Sequoia.

and CE retailers shortly after CES.

The company introduced the HD Radio Monitor, model M2, a receiver and modulation monitor for HD Radio broadcast sources. The high-resolution, peak and hold 50-segment LED meters in the M2 indicates RF carrier modulation percentage and audio modulation in dB. The M2 can also include optional alarms for over-modulation, loss of audio and loss of carrier. M2 tuner functions can be monitored and controlled remotely with a USB interface.

The company also displayed the HD Broadcast Reference tuner, designed to be a benchmark IBOC receiver. It can, depending on configuration, receive and distribute 10 audio and video signal sources including HDTV, HD Radio with surround sound (if transmitted), analog AM and FM, and TV to multiple zones. Future broadcast modules will include satellite radio as well as streaming Internet audio, the company said.

Ibiquity Executive Director of Broadcast Business Development Scott Stull said the product introduction means broadcast monitors from three manufacturers will soon be available for HD Radio: Belar, Audemat-Aztec and DaySequerra.

KUVO(FM) DOE Mike Pappas said DaySequerra would deliver one of the first units to KUVO for a combined SBE/AES seminar on HD Radio Feb. 23 in Denver.

NEWS MAKER

Brinitzer: Rising in His Radio Calling

by Randy J. Stine

CHARLOTTE, N.C. Not too many broadcast engineers have résumés that show their first CE gigs at the tender age of 16. Ben Brinitzer is in that select group.

While balancing English and AM transmitter maintenance may seem like a huge challenge for a teenager, Brinitzer, now 40, says the broadcast experience he gained while in high school helped solidify a work ethic that has helped him rise to regional vice president of engineering for the mid-south region for Clear Channel Communications.

Brinitzer oversees engineering for five stations in Charlotte, N.C., including FMs WEND, WLYT, WRFX, WIBT and WKKT. He also has oversight responsibilities for 20 chief engineers at stations across several states including North Carolina, South Carolina, Georgia and parts of Tennessee.

Lots of travel

As the result of those duties, Brinitzer travels three weeks out of each month. He has been concentrating on HD Radio installs since last fall.

"I enjoy being on the road. I'm never stagnant that way. I can visit Atlanta or Nashville and come back with a new perspective of how to do things better in Charlotte and the rest of the company," he said.

"The IBOC conversions have been great experiences. HD Radio is changing our world and makes me feel like a kid again. I'm still learning a lot."

Brinitzer was born in Manhattan and lived across the river in Woodcliff Lake, N.J., until he was 7. He and his family then moved to Chapel Hill, N.C., which is where Brinitzer discovered broadcasting and electronics.

"My father gave me a CB radio when I was 11, and I tore that thing apart and put it back together again to learn how it worked. I became very interested in RF and experimenting with antennas."

Ben Brinitzer

After making acquaintances with a gentleman who ran the local electronics shop in Chapel Hill, Brinitzer began a "job shadow" program through the private school he attended. He worked at WCHL(AM), a Class C in Chapel Hill. The station was 5 kW during the day and 1 kW at night with a two-tower directional setup.

"I was even on the air a little bit. The station really was cutting-edge in live assist automation in that the jocks voice-tracked. They would lay down their cuts on 10-minute cartridges and we would manually insert them" into an automation carousel, he said. The job paid minimum wage.

Brinitzer spent the majority of his first two years at WCHL shadowing the chief engineer. When the CE left to join the public broadcaster in town, Brinitzer was deemed the successor.

"I guess I was the natural choice to take over. I was the only kid in school with a pager back then," he said with a chuckle.

After high school and two years as CE at WCHL, Brinitzer enrolled in the Cleveland Institute of Electronics, the correspondence course founded by broadcast engineer Carl E. Smith.

"I made it about three-quarters of the way through, but gave up when it came to the television part. I just wasn't interested enough in it," he said.

RF fundamentals

Brinitzer soon after went to work for James Davis Consultants in Durham, N.C., an engineering firm with 20 clients in the state, learning the fundamentals of RF planning and patterns.

"I was exposed to three- and four-tower directional arrays. I ran transmitter installations and studio installs. It was really a college education. I learned the management side of the job."

For five years Brinitzer traveled the state, learning everything he could from Davis, who was an electronics Ph.D. and taught at Duke University. "We were even building our own consoles for some of our clients. I consider him to be my mentor."

It was in 1985 that Brinitzer's engineering career took off with a job as CE at WDCG(AM/FM) in Raleigh-Durham. The owners of the combo, the Durham Herald Company, gave Brinitzer a blank check to rebuild the stations to prepare them for sale.

"I got hooked up with Broadcast Electronics because we were running an early version of AudioVault. In fact, we were the only station in the state at that time run-

See BRINITZER, page 7 ▶

Brinitzer

▶ Continued from page 6

ning music and commercials off hard drive. Those hard drives were a whopping 8 GB ... just boat-anchor, full-height drives."

The rebuild included computer-controlled remote control for automation, routing switchers, centralized UPS systems, sound walls a foot-and-half thick and more. "It was truly first class across all platforms," Brinitzer said.

Prism Radio Partners purchased the combo in 1991. Brinitzer was named director of engineering for the group's 17 stations in five markets the next year.

Bill Phalen, Prism general partner and chief executive officer, "was enamored with my work and liked the fact I had RF design software experience. He put me to work on improving his facilities in Tucson, Wichita and Jacksonville," Brinitzer said.

By 1994 Brinitzer was working for Dennis Ciapura at SFX Broadcasting after SFX purchased Prism. "And so began the consolidation shuffle," he said.

SFX was absorbed by Capstar Broadcasting Partners, which became AM/FM Inc., and, ultimately, Clear Channel Communications.

Over the years, Brinitzer has presented technical papers at several trade shows, including NAB and the World Media Expo, headed numerous studio and transmitter site construction projects and developed strategic acquisition analysis for radio's largest group owner.

An 'analytical' approach

"Clear Channel is by far the best company I've ever worked for," Brinitzer said. "They afford me the opportunity to get it done and get it done right. It sees the importance of allowing engineering to manage capital and assets."

Brinitzer reports to Jeff Littlejohn, senior vice president of engineering, Alene Grevey, senior vice president of the mid-south region for Clear Channel and Steve Davis, senior vice president of capital management.

Brinitzer considers his strength to be "management of engineering" and an analytical approach to projects.

"If you want a transmitter designed to the individual component level, that's probably not for me. But if you want a transmitter site designed and built with a killer coverage, I'm your man. I know my weaknesses and know who to call when or if help is needed," Brinitzer said.

A typical IBOC installation for Clear Channel involves several days of training for local staff along with the actual hardware installation, Brinitzer said. "IBOC is not plug-and-play, especially for AM. Any antenna system that works for analog doesn't necessarily mean it will work for digital. Some AMs need nothing more than a phase rotation network installed in front of the antenna system," Brinitzer said.

Clear Channel is doing IBOC installation in-house, but Brinitzer suggests broadcasters seek the advice of a professional consultant for their unique IBOC situation.

"Regardless of the challenges, Clear Channel continues to install IBOC at a very rapid pace with great results," Brinitzer said. "My goal with each project remains minimizing the power requirement and maximizing overall operation."

Brinitzer's vendors of choice include Broadcast Electronics for transmitters, Prophet Systems Innovations for automation and Audemat-Aztec for RDS — a technology still underutilized by the radio industry, he said.

"I believe we will see RDS migrate into something even greater than it is today, eventually providing other services to both private and public entities," Brinitzer said.

Clear Channel kicked off controversy last fall when the company announced it would begin reducing audio bandwidth to 5 kHz for most AM stations and 6 kHz for music-intensive AMs.

Brinitzer said Clear Channel's directive for reducing bandwidth is the best idea the company has ever had.

"Even if HD Radio didn't exist, I've seen enough phenomenal success (from decreased bandwidth) to say it's a very worthwhile effort. The improvement of performance of even some of our Class D stations has been significant. When you roll back the response to 5 kHz you can then hear them in places you never have before," Brinitzer said.

The benefits include reduced interference to co-channels and improved efficiency of the main channel, he said.

"When you're putting more power in the center of the channel and less into the sidebands, you will improve coverage. I think in general there is a lack of understanding of what the benefits are," Brinitzer said.

Brinitzer lives with his wife Nancy in Charlotte.

Brinitzer at work

Promotion

▶ Continued from page 1

A big splash at the 2005 Consumer Electronics Show by the radio groups — which also are investors in Ibiquity — was timed to make an impression especially on automakers and receiver manufacturers, said Ibiquity Digital President/CEO Robert Struble. Ibiquity has a commitment from at least one automaker to include HD Radios in some models due this year, and other automakers "are quoting," Struble said.

"We've been telling (the carmakers) all along, but it makes more sense when they hear a Scott Royster or David Field say, 'We're converting all of our stations quickly and I'm going to promote the heck out of this, and you're going to have guys coming into your showrooms asking for HD Radios.'" Royster is chief financial officer of Radio One; David Field is president/CEO of Entercom.

The 21 groups agreed to speed the conversion of 2,000 stations, including AMs and FMs, to HD Radio. Unclear was how many were newly committed, vs. how many were previously announced commitments that are now accelerated. Ibiquity declined to provide specifics.

Combined with roughly 500 stations that have licensed Ibiquity's technology, this means 2,500 reportedly have committed to HD Radio, including stations in all of the top 100 markets. Struble called the news a significant step, "in many ways ... as significant as the FCC's approval of HD Radio technology more than two years ago."

Photo by Leslie Stimson

Executives from several groups that use HD Radio took part in a press conference at CES. The companies are Ibiquity investors. From left: Tom Bender of Greater Media, Detroit; Neil Johnston, CFO of Cox Radio; Bruce Reese, president/CEO of Bonneville and chair of the NAB Radio Board; Robert Struble, president/CEO of Ibiquity; Scott Royster, CFO, Radio One; and David Field, president/CEO, Entercom.

He pegged radio's overall cost for the conversion of the 2,500 stations at about $200 million. An Ibiquity spokeswoman later described that as a rough estimate of all costs involved but declined to itemize the figure or comment on whether it includes simply hardware, or also promotions, licensing fees and investments in Ibiquity.

The agreements includes station commitments from ABC, Cumulus, Emmis, Entercom, Entravision, Greater Media, Infinity, Jefferson-Pilot, Journal, Liberman, NextMedia, Radio One, Regent, Saga, Sandusky, Susquehanna and Univision. All are investors in Ibiquity.

Some companies had committed converting stations earlier. In addition to Clear Channel, which is transitioning 1,000 stations, Cox, Entercom, Susquehanna and Beasley had announced they would convert the majority of stations within 3 to 4 years. Thus by Radio World's reckoning, the majority of the 2,000 stations mentioned at CES already had committed to going digital. What appeared to be new were the accelerated timetable and the commitment by broadcasters to promote the technology.

An Ibiquity spokeswoman summed up the agreements as "a revitalized commitment" to HD Radio by the radio groups.

'Way ahead of schedule'

Clear Channel announced it has converted 65 stations, which it said translates to 95 percent of its stations in the top 100 markets. The pace was "way ahead of what we had scheduled" for them, Struble said.

Clear Channel Radio Executive Vice President of Distribution Development Jeff Littlejohn said the process of preparing stations for IBOC and advanced services such as traffic/weather data and supplemental audio is "daunting. We are attacking it head-on. Now is the time to step up and promote this technology," said Littlejohn, who added that his company and other groups intend to work with electronics retailers in their markets on events to promote HD Radio.

Entercom President/CEO David Field announced that his company intends to complete its IBOC conversion by the end of 2006 — in two years rather than four as originally planned. He said HD Radio offered "an opportunity to create new stations and grow content."

Greater Media, the first group to allocate equipment purchase funds for IBOC for all of its stations, said it intends to have all 19 converted by the end of the year.

Neil Johnston, chief financial officer for Cox Radio, said on-demand features give radio a chance "to offer branded opportunities to advertisers." Both Cox and Radio One plan to complete their conversions within four years.

Executives for several radio groups told Radio World they are still considering what sort of data services to use along with their digital streams, including supplemental audio. Littlejohn said, "We're looking at it. Everybody is. We're all trying to figure out how to make this work."

Royster said, "We're discussing it internally and with our counterparts at other radio companies. I think you're going to see collaboration in the industry here because it does not make sense for every radio company to go out and do its own thing. We'd end up just beating each other up.

"To some extent, we need to find ways to work together because, like Bob (Struble) said, 'This is where the fun starts.' But it's also where the challenge starts in terms of figuring out just what does the marketplace want and what can we deliver that also works for our business model."

Struble believes the radio groups are going to put together "a massive campaign. The industry has to make an effort to at least do what the satellite guys are doing." The satcasters spend $100 million a year on promotion that includes national TV, he said.

"This will be a different sort of campaign, more grass roots-based, more directly local. But I think the mouthpiece, collectively, of the industry is so great that if the gang gets together to do this ... it's going to have a huge impact."

'A massive campaign'

Ibiquity is encouraging radio groups to negotiate group buys of digital receivers to use as giveaways in key markets.

Don Kelly, hired last year to work with stations on promotions, said the company is putting station executives in touch with receiver manufacturers and CE retailers.

"This is a year we're going to see stations come on at the rate of one, two or three a day," he said. "We're making sure we have support for those stations. We're hoping to get as much on-air branding and co-promotion with retailers as we can get. Radio reaches some 200+ million people every week. What better medium to market HD Radio than to use the radio stations to do it?"

Kelly said he and former CBS Radio executive Dan Mason, an Ibiquity consultant, visit stations to talk with GMs and PDs about what they can do with the data capabilities of HD Radio.

"Once they realize they can promote the elements of the station, do more weather and traffic and not add to the clutter, they get excited. This fits right in with the 'less is more' strategy."

Ibiquity hired a CE veteran to oversee a nationwide retail program. As vice president of retail business development, Bernie Sapienza will coordinate efforts with manufacturing sales/training teams, distribution channels and retailers to promote the sale of digital receivers, focusing first on markets with several stations converted.

Struble called the move part of the company's evolution from an engineering-based to a marketing-oriented company.

Ibiquity licensing agreements for broadcasters were included in the deals with the 21 groups. Owners that agreed to accelerate their conversions to the first half of this year agreed to pay a flat, one-time licensing fee of $5,000 per station, said Struble. The price of converting after mid-year will increase; he declined to say by how much.

The licensing contracts still include a 3 percent fee to Ibiquity for revenue derived from data services.

Non-coms are exempt from the data licensing fee, under conditions.

Leading POTS Codecs Compared.

	Comrex Matrix	Tieline Commander	**Zephyr Xport**
Audio Bandwidth @ 24 kbps @ 19 kbps	14 kHz 11.2 kHz	15 kHz 9 kHz	**15 kHz** **15 kHz**
Direct Internet Software Updates	No	No	**Yes, via Ethernet port**
Digital PC Audio Input	No	No	**Yes, via Ethernet port and supplied driver**
Audio Metering (XMIT/RCV)	Transmit only	One-at-a-time	**Simultaneous**
Audio Processing	None	Simple AGC	**Digital multi-band AGC with look-ahead limiter by Omnia**
Remote Control	No	RS-232 and dedicated computer	**Ethernet via Web browser**
Auto Dial Storage	19 Numbers	50 Numbers	**100 Numbers**
Frequently-Used Settings Storage	none	none	**30**
Standards-based POTS Codec	No - Proprietary	No - Proprietary	**Yes - aacPlus (MPEG HEAAC)**
Transmit-Receive Quality Display	No	Yes	**Yes**
Contact Closures	2	2	**3**
Display Resolution	120x32 LCD	120x32 LCD	**128x64 LCD**
Analog Cell Phone Interface	Optional	Standard	**Standard**
Mixer Inputs	1 mic, 1 mic / line	2 mic / line	**1 mic, 1 line**
Phantom Power	No	No	**Yes - 12 volt**
Automatic Voice-Grade Backup	No	No	**Yes**
Power Supply	External	External	**Internal auto-switching**
Local Mix Audio Outputs			
Headphone	Yes	Yes	**Yes**
Line Level	Yes	No	**Yes**
Direct Receive Audio Output	No	Yes	**Yes**
Uses ISDN at the Studio Side for More Reliable Connections	No	No	**Yes - your Zephyr Xstream becomes universal POTS and ISDN codec.**
Available ISDN Option	$850.00 (adds MPEG L3 & G.722)	$850.00 (adds G.722)	**$495.00 (adds G.722 & state-of-the-art AAC-LD for high fidelity and low delay)**
List Price:*	$3,700.00	$3,650.00	**$2,495.00**

The world's most advanced POTS codec
is also the world's lowest priced POTS codec.

Telos
AUDIO | NETWORKS

* Refers to base MSRP without ISDN option as of 5/1/04. The Telos logo, Zephyr, Zephyr Xstream, Zephyr Xport are all registered trademarks of TLS Corporation, © 2004. aacPlus (TM) Coding Technologies. Comrex, Tieline and associated trademarks are property of their respective owners. Product spefications quoted from manufacturer's most current published documentation at time of printing.

Wanted: Info on E.F. Johnson Parts

by John Bisset

Radio World Editor Paul McLane and I both enjoy the comments from readers who have discovered our archived *Workbench* columns. Mark Goff spent an afternoon recently scrolling through the past at *www.rwonline.com*. He calls it "wonderful stuff."

Thanks to each of you who have contributed over the years. Consider this as your way of giving back to the industry, helping others. You'll never know how many engineers your tips and suggestions have aided.

★ ★ ★

Goff is market chief for Eagle Communications. He has just taken over a three-tower DA in central Kansas. Performing an assessment of the array, he discovered a melted roller contact on an old E.F. Johnson variable inductor.

Mark is trying to locate documentation on the components in the phasor and writes that some items date to 1947. Sounds like AM, doesn't it?

He asked for a cross reference for the part or model number for this original coil. I suggested he contact Tom King's crew down at Kintronic Labs in Bristol, Tenn. (*www.kintronic.com*). In addition to phasors, AM diplexers and coupling networks, Kintronic offers a lot of replacement parts, especially for the old E.F. Johnson contactors.

There may be other sources. Readers, do you have ideas? Tell me about them and I'll share.

Mark Goff can be reached at *mark.goff@eagleradio.net*.

★ ★ ★

Steve Ordinetz is chief for WOTX(FM) in Concord, N.H. Fig. 1 shows the simple magnetic switch that serves as a backup alarm to his transmitter site intrusion system.

In the Dec. 29 column I told you about Entercom Scranton's Lamar Smith, who tied this type of switch into his remote control. Steve had done the same thing. Fig. 2 shows the status alarm triggered when the door is open.

Security systems don't have to be elaborate. Sometimes simple is better.

★ ★ ★

George Katzenberger mentioned our recent "Scrubbing Bubbles" tip to a beekeeper friend, who offered his own tip for dispatching a swarm of bees after a hive falls off of a truck or — as happened to him — a car knocks over a hollow tree full of bees. The first responders needed him to get rid of the bees so they could get about their work.

The beekeeper's method is to mix one cup of liquid dishwashing detergent in a gallon of water and put it in a hand-pump garden sprayer. He uses that to spray the bees. He says they will drop like they were shot.

The method is non-toxic, unlike most insecticides. This a more cost-effective solution (no pun intended) than aerosol cans if a large number of the pesky stingers need to be dealt with.

Thanks, George, for the recipe — a low-cost one, at that. Katzenberger can be reached at *gkatzenberger11@earthlink.net*.

★ ★ ★

Dick McGraw is CEO of the McGraw-Elliott Media Group. He writes with an inquiry for readers:

Is there currently a portable FM receiver that is fairly immune to close-range Marti 161 MHz interference? Dick and his staff like to monitor off the air when doing remotes and feed the station into their PA system at the events.

See CROWN MOLDING, page 12 ▶

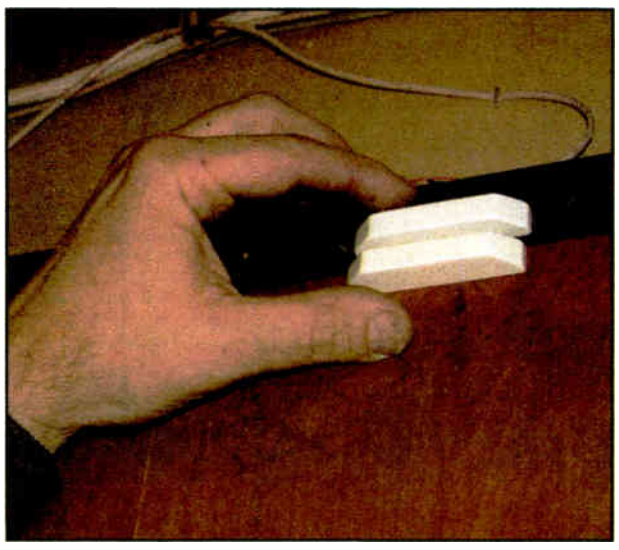


Fig. 1: A magnetic switch can alarm your transmitter door.

Fig. 2: You can tie your site's door to the remote control status.

Fig. 3: Snowed in at the transmitter? Here's one way to pass the time.

Juice up your Remotes

i-Mix G3

The new Tieline i-Mix G3 codec mixer combines 6 valuable remote broadcast tools into one 16x9" compact box.

- Your choice of powerful PSTN, ISDN and GSM codecs
- A configurable 16x11 cross point digital audio router. (optional)
- A configurable live communications facility for local and back-to-studio communications.
- A 7 input and 3 output configurable digital audio mixing facility.
- A built-in telephone talkback facility for taking live callers in the field
- On-board relay and RS-232 control system for local and remote control of equipment at either end of your codec link

Contact your favourite dealer or Tieline Technology to order your free demonstration i-Mix G3 and see www.tieline.com for a complete functionality and specification list.

800-750-7950

Tieline® TECHNOLOGY

www.tieline.com/rw

Price Relief for Independent Broadcasters

Not Part of a Radio Group? That Doesn't Mean You Can't Organize Your Buying

by Frank Grundstein

Last fall I wrote an opinion here about how small to large groups could stretch their capital spending dollars (Oct. 20, "Manage the Process, Not the Purchase"). But what about independent broadcasters, the single-station owners? They cannot partake in the advantages of economies of scale. Yet in many cases, they're the ones who need it most.

They, too, can take advantage of quantity purchases — through co-ops.

Co-op buying has worked for many groups. One that springs to mind is the grain co-op, in which farmers band together for better purchase prices on seeds. (They also band together for better prices on sales, as well).

How can this concept work for independent broadcasters?

Get together

Several station owners can organize a buying co-op. After they determine their capital spending, one member is assigned to organize the group's purchases, as I have discussed in previous articles. When the co-op knows what items and how many items members need, it appoints someone to negotiate with vendors.

The co-op vehicle probably is not going to be effective for buying smaller studio items. But it can work for most RF purchases.

Transmitters certainly would be a natural for this kind of purchasing. Standard antennas would be easy. Transmission line would be a little harder to organize, but could be purchased this way if the person administering the system was knowledgeable.

There is a vehicle in place in most states around which to organize this purchasing: the state broadcast association.

Stations already are working together through state organizations that monitor events affecting members. Why not help them get better value for their capital dollars?

Most such groups have one or more engineering board members. He or she could be in charge of the co-op program. An engineer would have the technical knowledge to talk to the vendors and, in most cases, the manufacturers.

Big picture

The person in charge of organizing the co-op plan would obtain a list from station members detailing the purchases of, say, transmitters in the coming year. Included in the list could be related RF equipment — dummy loads, transmission line (rigid and flex) and antennas.

A co-op buying plan can help independents achieve the purchasing leverage enjoyed by groups.

The organizer would determine the preference of the station for brands. Some stations will want specific transmitters; some will not care about brand as long as it is a reliable device.

This may be a strong negotiating block. Let's say you have 10 members who want Transmitter Brand A and six who want Transmitter Brand B; you also have five who don't have a brand preference but just want the lowest price. You can use the swing purchasers to negotiate a better price for all the buyers.

Some have asked me why a state association would want to do this. What's in it for them?

The members of state associations whom I've met seem truly concerned about the financial health of their stations. That is why they exist. A purchasing co-op would be an additional service that groups could offer members to save money, always a good thing. Lower costs for capital items certainly would be a benefit.

The co-op also could provide a new resource: someone with whom to discuss purchasing — an informed opinion. And it might even increase membership, after non-member stations realize the added value in joining.

Fee system

If the association felt that it could not enter into this kind of service without a fee to offset administrative costs, it could charge a percentage of the money saved through the buying plan. The member would still reap a savings.

The organization could contract out the service to an independent purchaser. There are people qualified to set up a purchasing program for a fee, perhaps a percentage of money saved. Even if the fee was half of the money saved, members would benefit.

If state associations were not interested in providing this service, there are other organizations that might fill the gap. At the most recent NAB Radio Show, I attended a cocktail party for the newly elected board of the Independent Spanish Broadcasters Association. Another such group is The Idea Bank.

Groups like these might arrange for co-op buying for members.

Independent broadcasters can achieve the same purchasing leverage as mid-size to large groups if they organize themselves properly.

The author has worked as a radio chief engineer, video facility manager and equipment sales executive. He is domestic sales manager for Logitek; the opinions are his own.

RW welcomes other points of view.

Crown Molding

▶ Continued from page 10

For years Dick had been using a late-1960s Sony AM/FM/ SW receiver that had no problems at all. But over the years this old friend eventually disintegrated.

Dick has tried respectable brands with unsatisfactory results. He adds that, in his experience, the GE SuperRadio, great for audio, is one of the worst for rejecting Marti blanketing interference.

Readers, have you success stories? What can you recommend?

Dick adds that he's learned many wonderful tips from *Workbench*. Every now and then, he'll see a story that makes him think, "Gee, I thought I was the only one that had that problem."

Reach him at *megdick@verizon.net*.

★ ★ ★

Wondering what to do with all those RF adapters rolling around in your toolbox? Fig. 3 offers an idea, shared by Fee Lee, who saw it online.

Fee's engineering career runs back to the days of Mutual Broadcasting. He's held a number of engineering positions in the Washington, D.C., market, and is the chairman of SBE Chapter 37.

He's always on the lookout for engineering-oriented devices with a twist. Last year, Fee found a neat little LED key chain that the chapter gave away to members at its Christmas party. This year, he shares a link to an engineer's chess set, which subsequently also enjoyed coverage on RW Online. You can see it in Fig. 3. For more pix, go to *www.leapsecond.com/pages/chess*.

The leapsecond.com home page, by the way, has some interesting clock and timing information. It's one man's quest for the most accurate clock.

Fee Lee can be reached at *feehlee@fcc.net* (which is a cool Internet provider for someone in broadcasting, too).

★ ★ ★

Randy Murphy handles console, furniture and router sales for Wheatstone Corp. (*www.wheatstone.com*) and is former manager of the Harris Broadcast Center. Randy is known for the service he offers customers of Wheatstone products. This suggestion is a case in point.

Randy found a new way to hide cables without having to fish them through a wall. WireTracks CM kits turn crown molding into a removable wiring channel that you can use to hide low voltage or electrical cables (check your local codes).

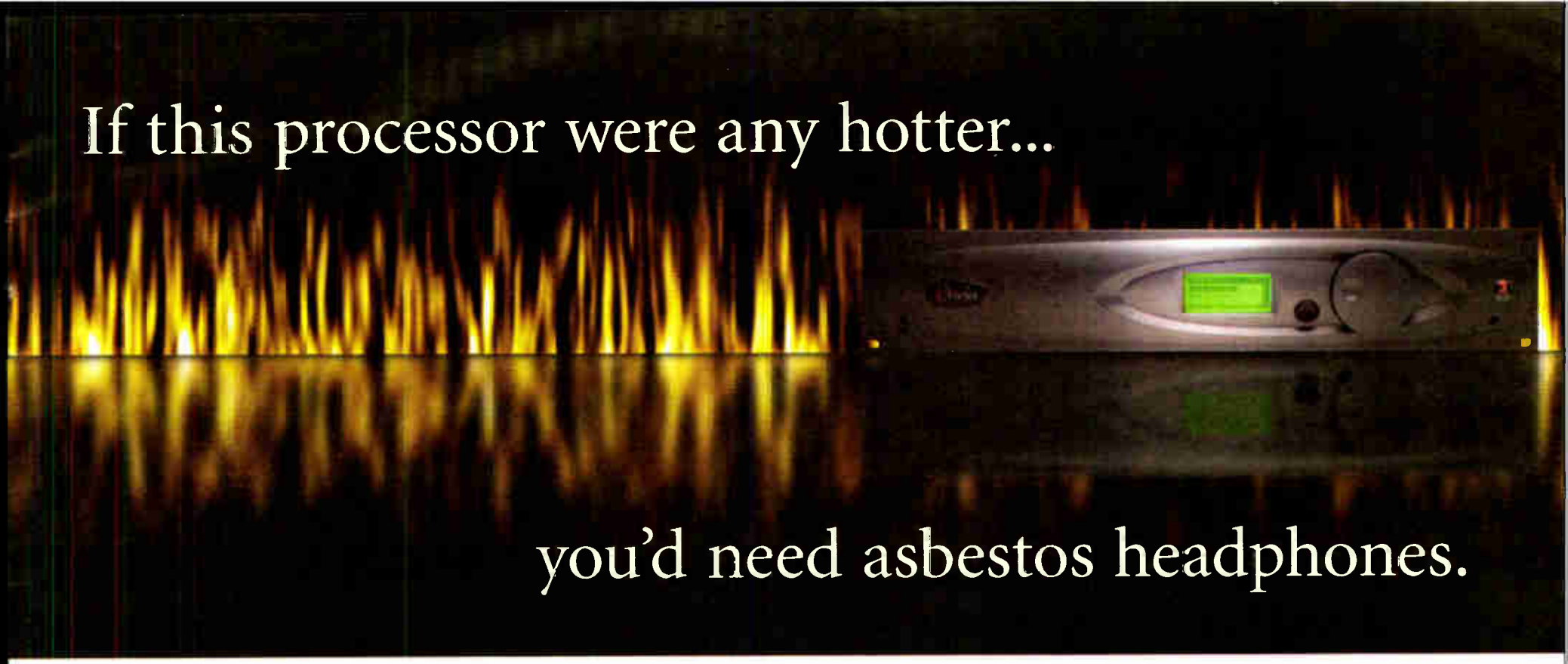
They were designed for consumer jobs and can be used to get wiring from the front of a home theater to the back. In commercial applications, the kits can be installed throughout a building to let you run wiring between any two points linked by connected walls. And because crown molding is installed above doorframes, it is easy to get uninterrupted coverage of an entire floor.

Find out more by visiting *www.wiretracks.com/prod-cm.html*. Murphy can be reached via e-mail to *randy@wheatstone.com*.

John Bisset has worked as a chief engineer and contract engineer for more than 30 years. He is the northeast regional sales manager for Broadcast Electronics. Reach him at (571) 217-9386 or jbisset@bdcast.com.

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

If this processor were any hotter...



you'd need asbestos headphones.

The new Omnia-3fm *Turbo* gives you features you might not find even in processors that cost a lot more. Here's a small sample of what you'll get:

- Adjustable, oversampled three-band limiter and three-band Automatic Gain Control section for smooth, clean sound that's as loud as you want it to be.
- Omnia Bass Management System provices up to 12 db of bass boost using specially designed, time-aligned algorithms for the loudest, cleanest low end ever.
- Remote control your way: standard serial and optional modem and Ethernet connectivity let you tweak your sound from anywhere, any time.
- Famous Omnia non-aliasing, distortion-controlled composite clipper helps you achieve the clean, loud sound you've been dreaming of.
- Full-featured I/O with analog, AES/EBU and composite ins and outs
- A double handful of format-specific presets to get you up and running quickly.

Omnia
A Telos Company

omniaaudio.com

Announcing Omnia-3fm *Turbo.*

There's a reason we call it "Turbo." This new Omnia has more than enough DSP muscle to grab and hold button-happy listeners, and burn your brand into their memory. Omnia-3fm Turbo's 3 new bands of AGC, 3 bands of precision limiting, and distortion-cancelled clipping stage work in harmony to deliver bold, thumping low end, crystal-clear highs and the warm, natural, open feeling for which Omnia is famous.

Clients rave:

"We raced Omnia-3fm Turbo against the Orban 2300 and DSP-X, and the Omnia was the loudest, cleanest and best box by far. This processor is incredible! It's like hearing the original Omnia again for the first time."
— Mike Oberg, WGMO-FM

"We installed two Omnia-3s... our competitors have noticed the change in the audio quality, and they are wondering what our stations have that they don't!"
— Allen Osborne Maldonado, Cocatel, Honduras

"We installed the Omnia-3 on KQAK-FM and noticed an immediate difference - so did our listeners! We sound louder, crisper and better than ever before.
— Keith Shipman, KQAK-FM

The new Omnia-3fm Turbo has a US MSRP of $3,995.00. But for a limited time, you can get it for **only $2,995.00.** Call your Omnia dealer for details.

Want to really stomp your competition? Get an Omnia-6EX, the six-band, dual-path processor with twin processing paths for your standard FM and HD Radio™ signals.

For AM audio that peels paint off the wall you want the flamethrowing Omnia-5EX HD+AM, with simultaneous processing for conventional AM and HD Radio™ broadcasts.

Put the power of Omnia in your Windows PC! Omnia A/X works seamlessly with Real, Windows Media, MP3 streaming encoders and audio production software to make your streaming audio sound fantastic.

Radio Pioneer, Inventor Bench Dies

by Ken R.

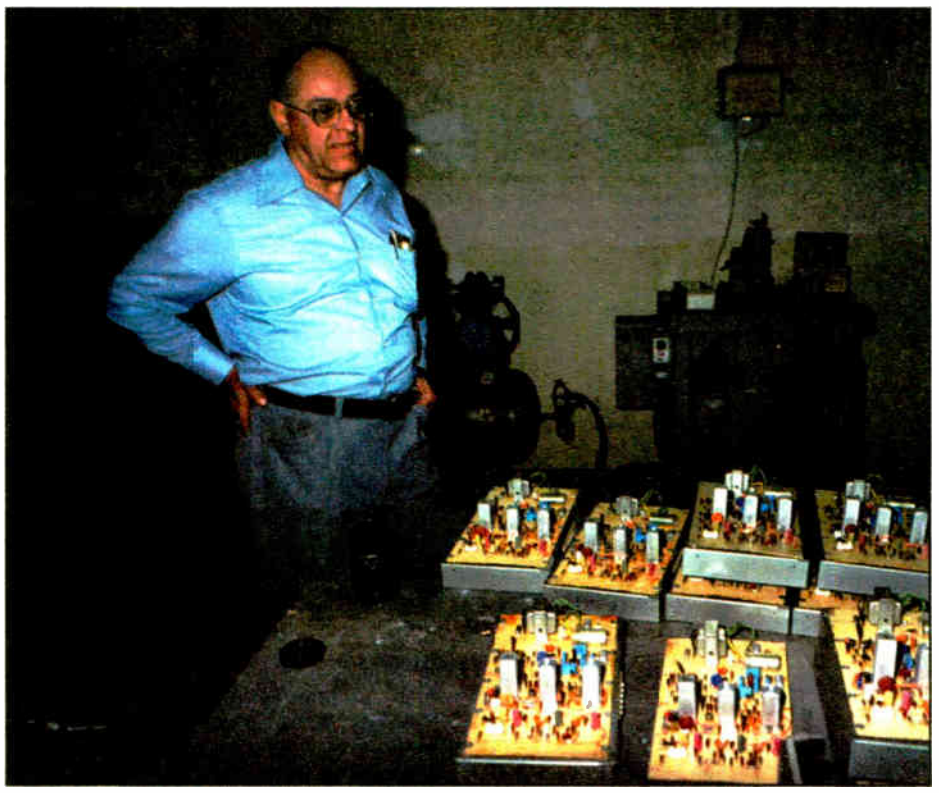
Edward "Ed" Bench died at age 83 on Dec. 7, 2004, in Belleville, Ill. An engineer whose career dated to the Second World War, Bench had been honored as an SBE Fellow shortly before his death.

Geoffrey Mendenhall, vice president research and development for Harris Corp.'s Broadcast Communications Division, knew Bench for about 30 years.

"In the 1970s he was chief engineer at KCFM(FM), St. Louis and I was a design engineer for Harris at the time," he said. "We worked together on a new FM exciter and we really valued his input and perspective. He helped us make sure the MS-15 performance and specs were what broadcast engineers wanted."

The relationship between Mendenhall and Bench also went deeper.

"He was a kind and personable fellow," said Mendenhall. "He was a good mentor with a lot of us at Harris and I kept in touch with him over the years."



Ed Bench is shown in his shop at KCFM in St. Louis with SCA receivers he designed. The photo was by Dave Hershberger in the mid-1970s.

Graduation, Army Air Forces Technical School, Yale, 1945

TV and radio

Ed Bench's career began in 1942, when he was assigned to the Air Corps and soon became an aircraft radio operator. In 1944 he returned to school to further study radio and then cryptography, after which he married and settled in East St. Louis, Ill.

Beginning in 1948, he worked for various radio and TV stations in the area, making discoveries along the way.

"In 1951 he developed the first two-cavity antenna diplexer for TV," said John Masters, chief engineer for KXEN(AM) in St. Louis, who knew Bench well. "Ed also solved the problem of Klystron tubes not lasting more than 1,000 hours by designing a proper beam current circuit."

In 1959 Bench became interested in FM Special Carrier Authorization (SCA) transmission, refining and designing circuits while chief engineer at KCFM.

Masters said Bench went to Washington in March of 1960 to attend an NAB convention, and he obtained the specifications for the newly approved FCC stereophonic FM system. He soon built one, learning about envelope delay and phase linearity, refining the generator by adding variable phase shifters and frequency sensitive phase delays.

Bench presented his documentation to the commission in December of that year and received type approval for the "KCFM Colorsonic Stereo Generator CSG-1." At midnight on June 1, 1961, KCFM made history by simultaneously signing on in stereo with two other FM stations in the nation. Manufacturers took note.

SBE honor

In addition to his radio achievements, Bench was a humanitarian. He worked with Jo Kathman, executive director of Radio Information Service for the Blind and Print Handicapped (RIS) at Our Lady of the Snows Shrine in Belleville, Ill., to design and manufacture sub-channel Pacesetter SCA receivers. He went on to help them remodel their studios. He was a member of the board of directors for many years.

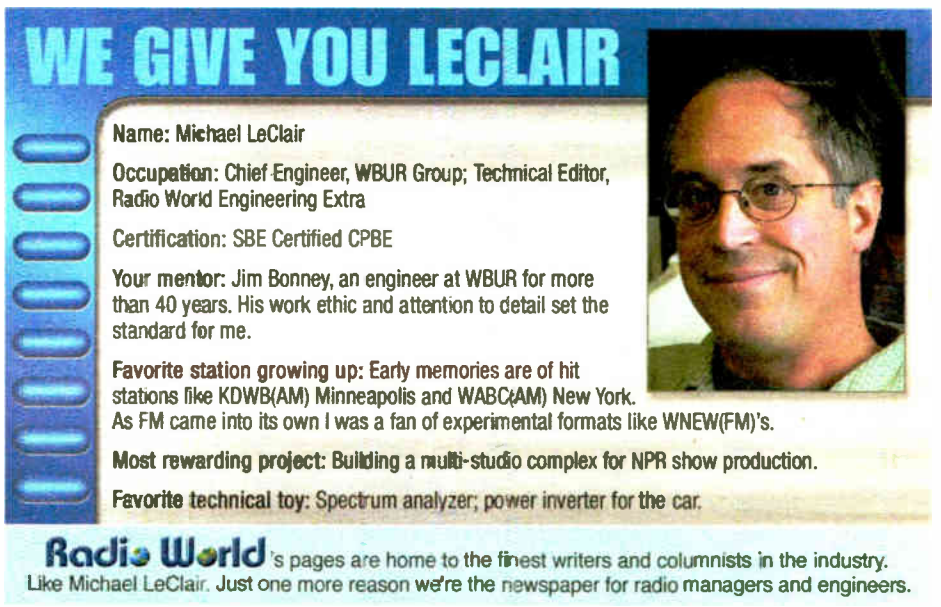
He also was a co-founder of SAVE, a non-profit organization that helps special education students.

Ed Bench received recognition during his career but a final honor came in October 2004 in Marlborough, Mass., when he was named an SBE Fellow.

"I attended a meeting of Chapter 55 on Dec. 2 to present the award to him in person, but by that time he was unable to attend because of his poor health," said John Poray, executive director of the Society of Broadcast Engineers.

A footnote came from the priest who officiated at Bench's final mass. Ed Bench visited the priest several months prior and didn't feel the church sound system was working properly. He insisted on fixing it.

Bench built an early stereo FM system, which signed on at KCFM in 1961.



SUPPLY SIDE

BE Prepares 50 kW AM Transmitter

"Supply Side" is a series of articles about radio broadcast suppliers you don't know, or facts you don't know about companies you do. This Q&A is with Richard J. Hinkle, recently promoted to vice president of engineering of Broadcast Electronics. We asked about the company's 50 kW AM transmitter, which was undergoing field tests when we spoke and was slated for delivery early in 2005.

Why an AM transmitter, and why at this power level?

This is a product area that BE until now has not supported. We're up to 10 kW, but not high power. We developed this technology based on the idea that we needed a high-power solution, and also because HD Radio is coming.

We've developed a technology that allows 89 percent efficiency, which is key to playing in this market and to the end user, because efficiency is key — (controlling) recurring costs.

What sets this model apart?

To get in this market, we had to come out with a better mousetrap, really go above and beyond.

The first thing is the efficiency. It's almost 3 percent better than what's out there. Another is that it is much, much smaller and lighter — perhaps 1/3 the size and 1/4 the weight of anything available. It weighs less than 1,000 pounds. Other models weigh over 3,500. Ours is not only easier to move but easier to ship, more cost-effective. And it will go through a standard doorway. It's tall, but it lays down.

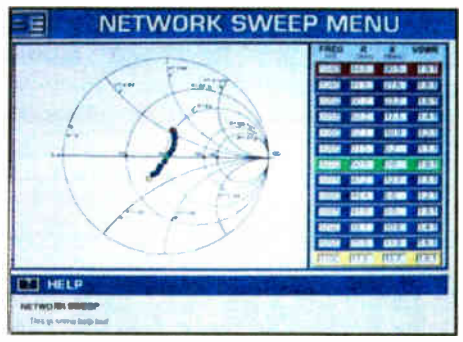
Typically you see very large iron power supplies used. We went to switch-mode power supplies, whose reliability has become very good and supply power factor correction of 0.99.

If the voltage and current are out of phase, your average utility bill will look lower than it really is. Internationally, this is a bigger issue than in the U.S.

Another thing that makes it unique is the user interface — a 15-inch XGA monitor, just like your computer, a flat screen with an enormous amount of diagram capacity and user interface. Also there are key features you don't see elsewhere. For instance you can sweep the antenna system and provide a network sweep via the GUI, or do a spectrum shot.

Are switching power supplies reliable?

If you look back in the history, 15 years ago maybe, switching power supplies weren't viewed as reliable as a transformer. Now they rival, and sometimes exceed, that.



Among the new transmitter's features is a network sweep via the GUI.

In AM, on the switching supplies, we operate at 400 volts. We took the most reliable part of the switching power supplies and use the front end of it.

You also promote the lower-power capability of the transmitter. Is this for AM at night?

Yes. Also because competing units sacrifice audio performance at lower power. This is also important if you lose modules. We can lose power as modules, without sacrificing audio performance.

Other vital info?

"What is 4M modulation?" We get questions about that. Is it PWM or is it like the DX? It's none of those. It's a patent-pending modulation we've applied for. The key is that all the PA modules are driven and combined in phase; we've eliminated the modulator.

We'll have a technical white paper ready for distribution shortly.

People also ask about the network sweep; is it under power? We do it at very lower power; otherwise we would be broadcasting power at other frequencies and we would get very large amounts of VSWR.

What does it cost?

The user price has been set at $150,000. Just like the footprint and weight, this is smaller than comparable models.

Info

Company: Broadcast Electronics Inc.

HQ: Quincy, Ill.

E-mail: bdcast@bdcast.com

Web: www.bdcast.com

HD Radio News

Traffic Data Ahead

Page 21

Radio World | Covering Radio's Digital Transition | February 16, 2005

NEWS ANALYSIS

NPR Moves Multi-Channel Forward

Network Seeks Manufacturers to Make Radios; It Will Provide Program Streams for Members

by Leslie Stimson

For some station executives, going digital only makes sense if there's an opportunity to create new programming to go along with the promise of better audio.

That's why this June, NPR plans to offer several program streams to member stations that plan to split their digital signals into multiple channels. By fall, the network hopes, receivers will be available to consumers to decode multi-channel digital radio.

Radio World has reported on the efforts of NPR and its partners Kenwood and Harris to test the concept of multi-channel digital. Now NPR is prepared to bring its Tomorrow Radio project to reality with plans for handling both the programming and hardware needs of member stations.

Anticipating a group purchase of receivers, the network is asking manufacturers to make HD Radios that can receive multiple digital signals. It is offering special, free, programming available to member stations to fill the channels with content.

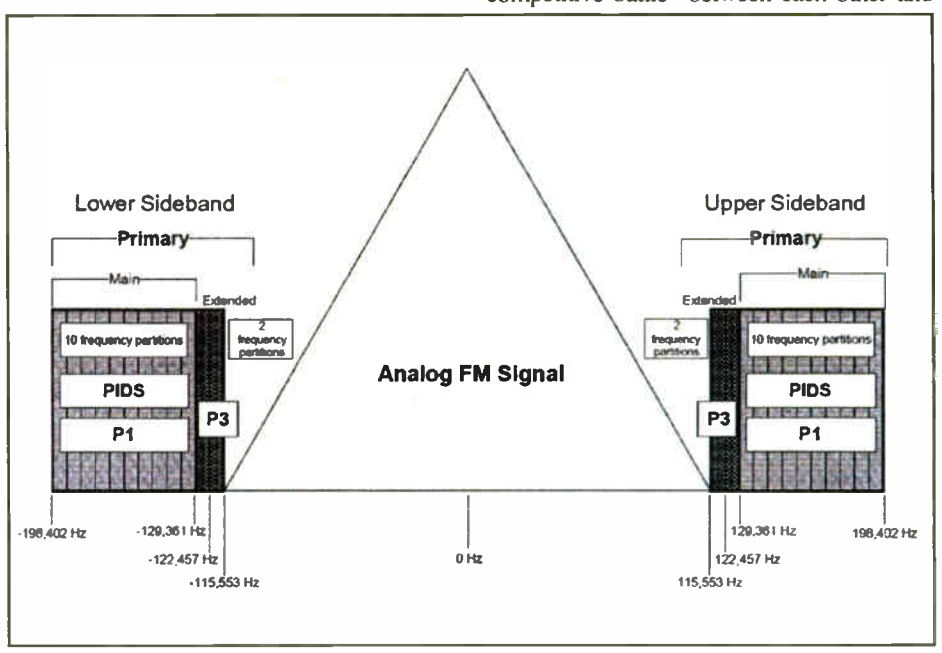
The target date is June for the first of a planned four program streams consisting of classical, jazz, news/talk and another music channel. Format streams developed for the supplemental channels are seen as the ones most likely to grow and be supported by the network for a long time, sources close to NPR said.

Many in radio long have argued that digital only makes sense if the industry can deliver improved content as part of the transition, giving consumers sufficient reason to buy HD Radios — just as subscribers to satellite radio do so for the new content.

Mike Bergman, Kenwood vice president of new digital technologies, said Tomorrow Radio "is the single most important feature to promote HD Radio because it gives the consumer another compelling reason to buy" aside from great audio quality with digital radio.

Photo by NPR's Emily Hellewell

From left: Scott Hanley, general manager of WDUQ(FM) Pittsburgh and an NPR board member; Ben Roe, NPR director of music; and Mike Starling, NPR vice president of engineering and operations.



RF channel spectral mapping diagram shows the primary main and extended hybrid modes for Ibiquity Digital's system.

Possible group buy

NPR released a Request for Information to licensed HD Radio receiver manufacturers at the recent CES convention in Las Vegas. Other HD Radio vendors were welcome to respond. A future group purchase could include 10,000 to 50,000 radios, said Mike Starling, NPR vice president of engineering and operations.

"It depends on what the manufacturers tell us about the price points, whether we can come to terms and actually execute a group buy. That's why it's an RFI as opposed to an RFP," or a Request for Proposal, he said.

NPR hopes to be able to craft a deal by the spring NAB show so it can place an order and have the units shipped in time for station fall fundraisers.

The radios would be used to seed the marketplace, probably as pledge premiums, and by station employees for station monitoring.

The RFI response deadline was Jan. 31. The network has brokered such group equipment buys in the past, he said.

Eventually, all stations would pay NPR for their radios, said John Kean, senior technologist at NPR.

While the multi-channel concept has garnered the most attention from the non-commercial world, commercial broadcasters are warming up to the potential of the supplemental digital channels. Several told Radio World they are looking at the concept.

At Ibiquity's press conference in Las Vegas, Entercom President/CEO David Field called the technology an "opportunity to create new radio stations to grow content."

Ibiquity Digital President/CEO Robert Struble said the extra channel capability of digital radio would "help these guys (representing different radio groups) light up a competitive battle" between each other and with satellite radio.

At the show, KCNV(FM) in Las Vegas became the 50th NPR member station to go HD Radio. It was featured in a supplemental audio demo at Ibiquity's booth.

Approximately 300 NPR member stations are in various stages of digital conversion, with funding for an additional 150 to 200 expected to be approved by the Corporation for Public Broadcasting this year, according to NPR executives.

See NPR, page 18 ▶

Radio World HD Radio™ Scoreboard

The HD Radio Scoreboard is compiled monthly by Radio World using information supplied by iBiquity Digital Corp. and other sources. The data shown reflect best information as of Jan. 14, 2005. This page is sponsored by Broadcast Electronics. HD Radio is a trademark of iBiquity Digital Corp.

HD RADIO IN: INDIANAPOLIS

Station	Freq.	Format	Licensee	On Air?
WICR(FM)	88.7	Clscl/Jazz	University of Indianapolis	Yes
WFYI(FM)	90.1	Nws/Tlk/Inf	Metropolitan Indianapolis Public Broadcasting	No
WGRL(FM)	93.9	80s Hits	Susquehanna Radio Corp.	Yes
WFBQ(FM)	94.7	AOR	Clear Channel Radio	Yes
WFMS(FM)	95.5	Country	Susquehanna Radio Corp.	Yes
WRDZ(FM)	98.3	Top 40	ABC/Disney	Yes
WRZX(FM)	103.3	Alternative	Clear Channel Radio	Yes
WGLD(FM)	104.5	Oldies	Susquehanna Radio Corp.	Yes
WIBC(AM)	1070	Nws/Tlk/Spt	Emmis Communications	Yes
WNDE(AM)	1260	Sports	Clear Channel Radio	Yes

HD RADIO AT: CLEAR CHANNEL AMs

Station	Freq.	Format	Market	On-Air?
KFAN(AM)	1130	Sprts/Talk	Minneapolis-St. Paul	Yes
KFI(AM)	640	Talk	Los Angeles	Yes
KFXN(AM)	690	Sprts/Talk	Minneapolis-St. Paul	Yes
KHOW(AM)	630	Talk	Denver-Boulder	Yes
KKZN(AM)	760	Talk/Sprts	Denver-Boulder	Yes
KOA(AM)	850	Nws/Tlk/Spt	Denver-Boulder	Yes
WCOS(AM)	1400	Sports	Columbia, SC	Yes
WGY(AM)	810	News/Talk	Albany-Schenectady-Troy, NY	Yes
WHAM(AM)	1180	News/Talk	Rochester, NY	Yes
WHO(AM)	1040	News/Talk	Des Moines, IA	Yes
WIZE(AM)	1340	Adlt Stndrd	Dayton, OH	Yes
WLAC(AM)	1510	Nws/Tlk/Spt	Nashville, TN	Yes
WNDE(AM)	1260	Sports	Indianapolis	Yes
WSAI(AM)	1530	Oldies	Cincinnati, OH	Yes
WTPG(AM)	1230	Sprts/Talk	Columbus, OH	Yes

The Bottom Line

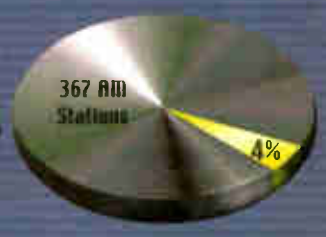
Total Licensed	On the Air
544	226

Last Month

Total Licensed	On the Air
477	180

Market Penetration United States

HD Radio Among Clear Channel AMs



Licensed by iBiquity and on the air

Licensed by iBiquity and not on the air

Surround Sound Gear Introduced at CES

by Leslie Stimson

LAS VEGAS Surround sound was the focus of several announcements at the recent CES convention.

Neural Audio Corp., which is adapting its 5.1 surround sound technology for HD Radio for use by broadcast stations, is courting automobile receiver manufacturers as well. Neural introduced its Spatial Environment Engine surround sound technology at CES.

SEE is a consumer version of the Neural development system designed to facilitate multichannel tests for receiver manufacturers that supply automakers. SEEDS delivers a two-dimensional stereo image using two to 256 speakers in the vehicle.

Neural's SEE achieves multichannel audio through a spatial downmixing and rendering process.

On the broadcast side, 5.1 content is downmixed to stereo via a Neural/Harris 5225 Mix-Edit Appliance, allowing digital broadcasters to transmit 5.1 encoded surround sound.

For a consumer radio, the stereo downmix may be delivered to 5.1 or as many loudspeakers as desired, Neural says.

"We've been concentrating on the encoding, optimizing the codec performance. Now we're introducing the decode side of the chain," said Mark Seigle, Neural vice president of business development.

"From day one, we've said you have to look at the whole broadcast chain to make this happen."

Neural says it now has several broadcast users of its technology. In radio, it lists XM, NPR, Clear Channel and Infinity; for TV, NBC, Fox and Viacom.

Neural Audio technology was a part of the first terrestrial digital broadcast of 5.1 surround sound for NPR's 2004 "Toast of the Nation" New Year's Eve Event, on which Radio World reported and was the only publication in attendance.

Seigle said the event showed that "real-world broadcast scenarios — different venues, different mixers, different content — all could survive quite nicely."

"There's going to be an educational process with mixers," he said "There are a lot of recommendations we can make so the audio survives (the surround sound process) better, such as what mind of microphones a broadcaster is using at a venue and where are those placed."

From day one, we've said you have to look at the whole broadcast chain to make this happen.

— Mark Seigle, Neural Audio

Neural surround technology also was used on a live local broadcast of a concert on KUVO(FM) in Denver in September, HD Radio's first 5.1 live event.

Seigle said Neural is planning its next surround event, and hopes a commercial broadcaster is interested in using its technology in this way as well. Some broadcasters, such as Infinity's KBKS(FM), Seattle, are airing some items in surround sound; XM is using it for one channel. At least two non-commercial stations are recording and airing some material in surround.

Through its relationship with Harris, Neural finds some radio groups are more interested in surround sound than others, depending on where they are in their HD Radio rollout. The company heard good responses from OEM receiver manufacturers at CES, said Seigle.

XM uses Neural for one channel of surround sound content. Neural had several demo cars with various receivers showcasing surround content at CES. Listeners could hear excerpts of the "Toast of the Nation" broadcast or the XM channel.

Sirius Satellite Radio is using SRS Circle Surround for one channel, an employee confirmed.

Neural gets Ibiquity nod

Ibiquity Digital Corp. gave Neural's surround sound technology the okay at CES, saying the system is compatible with HD Radio. The companies said Neural is the first spatial audio codec available for HD Radio use.

Ibiquity previously approved the SRS Circle Surround technology as compatible with its digital radio technology. Other companies, such as Coding Technologies/Orban and Telos/Fraunhofer, are interested in HD Radio applications as well.

As a result, members of the standards-setting body for radio are discussing how the technology relates to the digital transition.

Mike Lyons, vice president of aftermarket business development for Ibiquity, said the company is pleased that several surround systems are working with HD Radio in mind; he said Ibiquity encourages its broadcast and consumer electronics partners to realize "how powerful surround sound technology can be for FM radio."

Observers attending the show told Radio World privately, however, that surround sound for digital radio faces challenges, noting that some systems such as SRS and Dolby, are established in the marketplace with receiver and automobile manufacturers, and other technologies are competing for position, including Neural, Fraunhofer/Telos and Coding Technologies/Orban.

Also at CES, two OEMs announced their first U.S. receivers that would include SRS Circle Surround Automotive technology. Panasonic, which has HD Radio products on the market, is including the technology in three mobile CD receivers and one in-dash DVD receivers. Panasonic expects to ship to retailers this month.

SRS says its Circle Surround Automotive creates an in-vehicle surround sound experience from any audio material over a system of four or more speakers. It delivers surround sound from any audio source, including mono or stereo broadcasts, HD Radio, satellite radio, standard CD and compressed music from a portable media player.

The technology can create the perception of a center speaker if one is not installed, according to SRS, Panasonic and Fujistu Ten.

Fujistu Ten is employing the SRS Circle Surround Automotive in an Eclipse brand aftermarket CD/DVD navigation receiver. Eclipse is also launching two standalone CD/MS receivers with MP3 and WMA decoding that include surround sound technology.

Automakers and manufacturers of OEM or aftermarket electronics license SRS Labs' automotive technology. Companies using SRS in products include Eclipse, Honda, Johnson Controls, Kenwood, Panasonic, Toyota and Volkswagen.

Also at CES, Fraunhofer and Thomson joined with Agere Systems to introduce MP3 surround sound technology for the consumer and automotive markets. The partners say the technology will enable 5.1 channels surround-quality sound for Web-based music distribution, broadcasting systems, PC-related audiovisual or gaming applications, consumer electronics and automotive systems.

The partners demoed the technology at CES. For an evaluation encoder and player, go to:*www.mp3surround-format.com.*

NPR

▶ Continued from page 16

NPR hopes the FCC approves the multichannel concept for HD Radio early this year. That hope still held despite the resignation of Chairman Michael Powell.

In perceptual test results of Ibiquity's HDC codec at various bit rates, submitted to the commission in the fall, NPR said, "The new testing indicates that 48 kbps is perceived by most listeners as providing equal sound quality to the maximum rate of 96 kbps."

Optimum bit rate allocation varies according to format, so NPR hoped the agency would allow stations to determine their own bit rate allocation for multicasting.

The codec tests showed it was possible to achieve two near-CD quality channels, plus up to four additional voice-grade channels with minimal, if any, interference to existing analog radios, Starling said. Twelve codecs from nine vendors were tested.

In the initial tests last year, the main channel was 64 kbps and the supplemental channel was 32 kbps.

NPR referenced its "Report on Perceptual Tests of Low- and Very Low-Bit Rate Codecs," filed with the FCC — the results of testing that the network commissioned, along with the International Association of Audio Information Services and Ibiquity.

Participants wanted to see if the extended hybrid digital spectrum was suitable for radio reading service transmission. The testing measured subjective qualitative differences among the latest digital codecs that may be used for radio reading services.

The network stated, "Improved quality was achieved with readily available codecs compared to existing analog SCA technologies, both within a single extended hybrid partition and within two of the four available partitions. Based on these results, we believe radio reading services, and other specialized audience services, will be a practical service option via extended hybrid mode."

Reading services viable

"This would allow listeners who rely on these services to purchase commonly available mass-market receivers, ultimately freeing these services from reliance on specially manufactured SCA receivers, which historically have offered inferior quality service," it stated.

(For hybrid analog/digital broadcasting, the Ibiquity HD Radio system adds a number of OFDM carriers above and below the host analog signal. Groups of carriers are formed into frequency partitions about 6904 Hz each in width. Ten of the outer partitions form the main group, providing a 96 kbps digital stream for the primary audio channel [and optionally, supplemental audio]. Additional sets of partitions are allocated symmetrically within the pair of main partitions, called the extended hybrid mode. These interior partitions provide ancillary data streams at about 12.5 kbps each. Radio World will report further on these tests in a subsequent issue.)

Based on results in the tests, NPR asked the FCC for expedited authorization for public stations to begin digital multicasting to foster the development of diverse, new public programming services; eliminate the costs of retroactive upgrades; and afford stations the opportunity to streamline operations.

The network hopes the commission approves the multicasting initiative in the first half of the year.

Best-Selling Portable Codec

Comrex Matrix Audio Codec with GSM Module

Grab all the sound you can at even your most obscure remotes! The versatile and best-selling Matrix 15 kHz POTS codec allows for easy conversion to ISDN operation using Layer III or G.722, or GSM wireless with optional slide-in modules. Besides real-time transmission, the Matrix includes a store and forward feature so that 15 kHz audio cuts can be sent in "non-real" time. Portable and rackmount versions available.

FEATURES:
- 15 kHz full duplex audio on a single, standard telephone line
- 2 microphone inputs (one is mic/line switchable)
- Headphone output
- Line level output on XLR
- -10 dBu tape input allows connection to external audio devices

COMREX

MATRIX	Portable POTS codec	List	$3,700.00
MATRIXG5MD	GSM module domestic	List	$850.00
MATRIXISDN	ISDN module	List	$850.00

LowestPrice@bswusa.com
OR CALL: 1-800-426-8434

Low-Cost Professional Wireless

Shure Performance Gear UHF Wireless

Shure's new Performance Gear Wireless brings innovative automatic setup features for worry-free performance and gives you Shure's patented Audio Reference Companding for crystal-clear sound. The PGX24-SM58 features the popular SM58 cardioid mic cartridge with its vocal-tailored 50 Hz-15 kHz frequency response and durable construction. The handheld transmitter runs on two AA batteries and has a -10 dB pad. The package is completed with the diversity receiver, with XLR and 1/4" outputs, channel display LED and more. Also available are handheld systems with PG58 and Beta58 microphones. Call or go online for bodyback/lav systems.

PGX24-SM58	List	$558.00
PGX24-PG58	List	$530.00
PGX24-BETA58	List	$638.00

SHURE
LowestPrice@bswusa.com
OR CALL: 1-800-426-8434

Audio I/O Anywhere

JK Audio ComPack Universal Interface

Pick up this comprehensive road tool to get audio in and out of analog phone lines, PBX systems and even cell phones. The JK Audio ComPack is perfect for remote broadcasts, IFB feeds, or interviews over any phone connection. ComPack also functions as a simple telecom interface for your beltpack intercom system – connect the 3-pin male XLR to your beltpack intercom group for a full duplex, always-on connection to any phone line.

FEATURES:
- XLR mic/line in and line out
- 1/4" headphone output
- Standard RJ11 telephone interface
- PBX interface with handset type select switch
- 2.5 mm cellphone jack (cable provided)
- 3.5 mm line input
- Battery test button with indicator

JK Audio

COMPACK List $545.00 LowestPrice only $499!

JK Audio THAT-2 Telephone Audio Tap

Connect the JK Audio THAT-2 between your telephone and handset for quick access to audio in and out of the telephone. THAT-2 offers both RCA and XLR I/O, and a handset selector switch.

JK Audio

THAT-2 LowestPrice only $215!

Conex FlipJack Cellphone Interface

CONEX

The Conex FlipJack is an affordable 2-channel cellphone interface. Featuring 2 XLR inputs (mic and mic/line) and one headphone out, it uses your phone's 2.5 mm hands-free port. Includes cable.

FLIPJACK List $289.00 LowestPrice only $255!

BSW's Grab&Go Field Recording Package!

The perfect package for capturing interviews and news reports in the field!

NEW!!

This Package Includes:

marantz SENNHEISER SONY

Marantz PMD660 Flash Recorder

Record dozens of hours of MP3 audio on a single Compact Flash card (or as high-quality uncompressed WAV files) and easily transfer to your computer via USB port. You can even edit in the unit itself – use simple cut-and-paste editing or take advantage of non-linear, non-destructive playlist editing. Up to 99 virtual tracks let you compare edits, set up multiple sound bites or provide interview segments of varying durations. Features: onboard stereo mics for on-the-spot recording; two balanced XLR inputs and stereo line inputs; up to four hours power on AA batteries.

Sennheiser MD46 Interview Mic

This cardioid dynamic mic features a rugged, all-metal body, is very insensitive to pop and wind noise, and has extended frequency response and a comfortable feel/balance for easy use.

Sony MDR-7502 Headphone

The Sony MDR-7502 is a lightweight, tight, sealed-ear design that provides excellent isolation and a frequency response of 60 Hz-16 kHz.

Cable and Case Complete the Package!

BSW even includes a 5 ft. XLR mic cable and quality Marantz carrying bag to protect your recorder. Get in on this great deal today!

LowestPrice@bswusa.com Package Only $799!

You Save $249.48 AND get FREE SHIPPING when you order on the web
Order Item Number: PMD660PKG

Engineer's Helpful Hint #12:

Before sending the new intern out on the line to get an interview, make sure the batteries are charged and the mic cable is firmly attached.

BSW's Reporters' Handheld Mics!

Electro-Voice RE50B

The Electro-Voice dynamic RE50B is a superior reporter's mic. It features a built-in shockmount and an integral blast filter for lower handling and wind noise. Omnidirectional pattern.

RE50B List $264.00 LowestPrice only $150!

Electro-Voice 635A

Electro-Voice's popular dynamic interview mic features an omni-directional pickup pattern, voice-tailored response and rugged metal construction at a price that will make you smile. Includes stand clamp.

635A List $172.00 LowestPrice only $99!

Accessories:
314E Windscreen $18.00

Sennheiser MD46

Finally, a quality reporter's mic designed for use in noisy arenas such as stadiums. The cardioid MD46 features a rugged, all-metal body; is very insensitive to pop and wind noise; has extended frequency response and a comfortable feel/balance for easy use.

MD46 List $199.95 LowestPrice only $169.95!

Accessories:

MZW1	windscreen	$12.00
MZQ800	mic clip	$11.00

SENNHEISER

Shure VP64A

The affordable Shure VP64A dynamic omnidirectional interview mic sounds great and is extremely rugged. Its neodymium magnet provides increased output and improved clarity. Includes windscreen and stand clamp. The VP64AL has a longer (9-5/8") handle.

VP64A	List	$125.17	$79.00
VP64AL	List	$146.39	$93.00

SHURE

LowestPrice from $79!

MiniDisc Kit To Go

HHb MDP500 Portable MiniDisc Recorder

HHb's rugged Portadisc MDP500 MiniDisc recorder delivers rugged, high-quality digital recording on the go.

FEATURES:
- 2 Balanced XLR mic/line inputs
- Phantom power/limiting/ganging
- USB interface for file transfer
- RCA line outputs and headphone jack
- Coax and optical S/PDIF input/output
- Memory buffer for glitch-free recording
- Six second pre-record feature

Housed in a tough water and dust-proof Pelican case, the HHb Reporter's Kit (model #MDP500R/KIT) adds a Sennheiser MD46 interviewer's microphone with cable, universal charger/AC adaptor, two battery caddies, a USB cable and six HHb 80-minute MiniDiscs.

MDP500	MD recorder	List $1,599.00
MDP500R-KIT	MD kit with mic, case, cable	List $1,769.00

LowestPrice@bswusa.com
OR CALL: 1-800-426-8434

Lowest Prices on everything at: www.bswusa.com

Same Day Shipping
BSW stocks a huge warehouse of products. If we have it in stock, we'll ship it the same day. Just arrive by 7:00 PM Eastern Time.

Free Shipping on Web orders over $189
For a limited time, all web orders over $189 get FREE ground service delivery to the contiguous 48 states. Excludes heavy or oversized items.

BSW

Knowledgeable Staff
Our sales professionals have real-world broadcast and audio experience to offer expert help with your equipment purchase.

LowestPrice@bswusa.com
For the best prices on all of your gear visit us on the web at www.bswusa.com or email us for a quote at LowestPrice@bswusa.com

1-800-426-8434

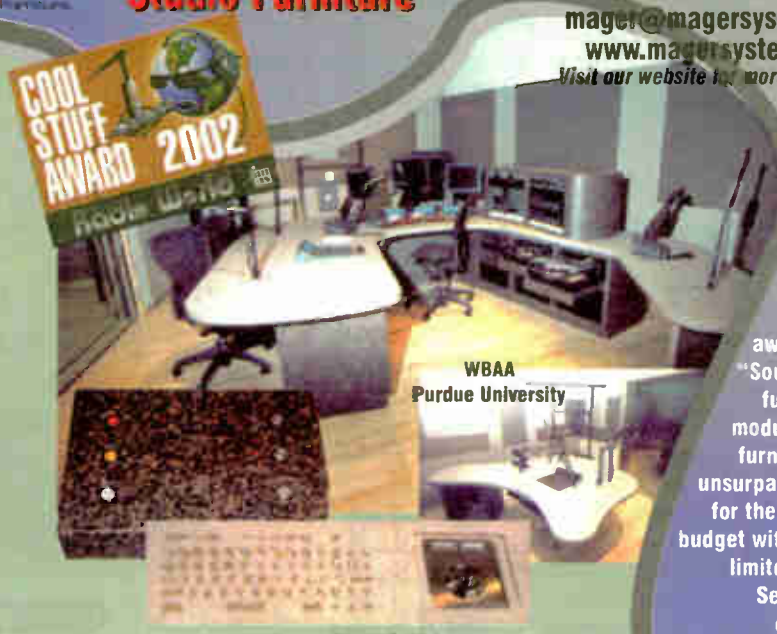
Products & Services

SHOWCASE

MAGER SYSTEMS INC.

Custom Studio Furniture

TEL: 623-780-0045
FAX: 623-780-9860
mager@magersystems.com
www.magersystems.com
Visit our website for more information



Since 1979 Mager Systems, Inc. has been custom designing and fabricating ***award winning*** furniture for the broadcast industry nationwide. We are still the innovators and leaders in ***solid surface tops*** and applications which comes with a ***10-year warranty***. Our complete ***one-stop-shop*** includes installation, ***turnkey prewiring***, switches and components,conference rooms, reception desks, and office furniture. Our blending of art form with cutting edge techniques, and a clear understanding of each client's application allows us to produce your ***showplace*** tailored to your budget.

MSI introduces our new award winning "Sound Choice" furniture. Our modular in stock furniture boasts unsurpassed quality for the economical budget with a 10-year limited warranty. See details on our website.

Touch Sensitive Switches & Keyboards

SCMS INC.

YOU KNOW WE KNOW RADIO!

29 Years of Service 1976-2005

- ✓Competitive Prices
- ✓Extensive Rental Fleet (RF Codecs Test Equipment, Audio)
- ✓Experienced Staff
- ✓Used Trade-Ins Welcomed
- ✓New and Rebuilt RF and Audio
- ✓Custom Studio Design and Furniture
- ✓Representing Over 600 Quality Manufacturers
- ✓Turnkey Installations Available

You Know We Know Radio

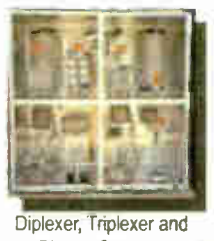
800-438-6040 • www.scmsinc.com • Fax 704-889-4540

AM Antenna Solutions

LBA Tunipole™
Folded Unipole Systems

RF Components

Vacuum Capacitors



Diplexer, Triplexer and Phasor Systems

COMET Sold Here!

LBA Technology, Inc. is your proven supplier of innovative, digital-ready AM antenna systems. Our products include tuning units, phasing systems, multiplexers, AM/wireless isolation systems and components for every power level. We help hundreds of broadcasters in the USA and worldwide to --

Reach further – sound better!

LBA Technology, Inc.

3400 Tupper Drive, Greenville, NC 27834
800-522-4464 / 252-757-0279 / Fax 252-752-8155 / Email Lbatech@Lbagroup.com / www.Lbagroup.com

LBA Since 1963

Affordable, Reliable & Flexible???

ABSOLUTELY!!

Check out the *PACEMAKER IIK*

(PC Board revision taking place: new devices, greater slew rate, better signal to noise ratio)

And don't forget the **Mini Mix 8A**

AUTOGRAM 800-327-6901 www.autogramcorp.com

Do Unattended Live Remotes

DR-IO Dial Up Controller & Remote Broadcast Interface

- The DR-10 is a Dial-Up remote control with telephone audio input and output for remote broadcasting.
- If your automation works with satellite networks, you can use the DR-10's relay outputs to fire commercials, liners, etc. Save $$ with no staff needed at the studio!
- Use the DPDT relays to insert the phone audio directly into the program path when necessary, especially for emergencies or to bypass your automation system.
- When used with our Silencer Option, the DR-10 is the ***ONLY*** product available that completely removes DTMF control tones from the audio path for clean remotes.

Get the DR-IO & start saving money now!
www.circuitwerkes.com

CircuitWerkes, Inc. - 352-335-6555

Digital and Analog Switching /Distribution Transmitter Audio Solutions ...

The AES-302 Digital Audio Switcher/DA/D to A

The CDS-302 Automatic Composite Audio Switcher/DA

The CDS-300 Composite Audio Switcher/DA

We are proud to introduce the next generation of composite base band and digital audio switchers from bdi. These new designs provide interface, switching and distribution solutions for your transmitter site. Use these quality products for confidence monitoring and switching functions made necessary by today's competitive environment. Elliminate embarrasing off the air outages caused by path losses. Visit our web site or call us for complete information about these versatile transmitter audio solutions which will provide complete confidence in your signal integrity and reliability.

Broadcast Devices, Inc.
Tel. (914) 737-5032 Fax. (914) 736-6916
www.Broadcast-Devices.com

bdi

Efficient Effective Affordable

RADIO WORLD'S
Products and Services Showcase
provides a perfect medium for
marketing your products and services.

For more information, contact
Simone Fewell at
703-998-7600, ext. 154
to request a media kit.

Radio World

Traffic Data Is New Digital Arena

Clear Channel, Audiovox Debut Service Using RDS; Launch in 48 Markets

by Leslie Stimson

LAS VEGAS Clear Channel Radio and Audiovox, working with Siemens VDO and Tele Atlas, are offering a real-time traffic data service in 48 markets. The network employs the Radio Data Systems Traffic Message Channel.

An Audiovox promotional photo of an AM/FM/DVD/CD/MP3 player with navigation display.

RDS TMC is used in more than 10 countries in Europe, as well as Japan, but not the United States, according to Jeff Littlejohn, executive vice president of distribution development and leader of the project for Clear Channel Radio.

"We're the first broadcaster to launch it. We're providing the data through Clear Channel radio stations," he said. Clear Channel believes it's the first broadcaster to deliver RDS-TMC in this country. It considers the announcement an extension of its commitment to digital radio services. He said the service is an outgrowth of a group formed earlier by Clear Channel to explore revenue opportunities for its RDS technology.

Monthly fee

The announcement brings Clear Channel and terrestrial radio into another competitive niche with satellite vendors XM and Sirius, both of which offer traffic data. The satellite companies and Clear Channel all tout the immediacy of such data for listeners accustomed to having to wait for scheduled radio traffic reports.

Sirius and XM downplayed the notion of expected competition from Clear Channel and Audiovox. A Sirius spokesman told Radio World, "We thought of it first. We think navigation (as a product category) will explode."

The consumer would need an Audiovox traffic receiver, a traffic subscription and a navigation system. The base navigation system typically consists of a "navigation computer" in or near the dash that holds changeable navigation CDs or DVDs, a display and a remote control.

The "Real Time Traffic" service keeps an Audiovox customer tuned to a "Traffic Message Channel." Traffic information is shown in real time as an overlay on a moving map display. Icons tell the user about accidents and suggest alternate routes. The real-time nature of the information allows users to adjust their routes immediately, Littlejohn said.

Clear Channel is collecting traffic information gathered via its reporters, road cameras, helicopters and airplanes, and formatting that data for RDS TMC, which it airs, along with call letter display data, over its FM subcarriers to be received by the traffic receivers. The broadcaster sells this information and RDS capacity to Audiovox; it could work with other navigation hardware and receiver manufacturers in the future on similar deals.

"We're kind of a one-stop-shop for Audiovox and other receiver manufacturers," Littlejohn said. "We generated the service and are selling it to manufacturers, who can resell it to their customers."

The Audiovox product was set to ship to retailers in January. Prices range from $59.90 for one year of service and $95.90 for two years. Executives said the traffic receiver would retail for $99, although Audiovox wasn't charging retailers for the traffic receiver for the month of January.

Available navigation displays vary depending on the size and type of car. Depending on the hardware configuration, the price range is roughly $1,200 to $1,900, said an Audiovox spokesman.

A rear-view mirror display option will be available for the new traffic service.

A replacement rear-view mirror includes a navigation input.

Siemens VDO, an OEM automotive supplier, and Audiovox make navigation hardware. Tele Atlas is providing the digital map data and location content. Rich Pearlman, vice president of navigation sales for Tele Atlas, characterized the use of RDS TMC as "significant" for the North American market.

48 markets

"This is the first implementation of this standard in North America. It allows systems providers like Siemens VDO and Audiovox to bring hardware and (navigation) systems they already have in place and use in other markets and bring it to North America, and do it rapidly," said Pearlman.

Audiovox also sells receivers and other products to the satellite radio suppliers. Asked why the company chose to partner with Clear Channel and use the RDS-TMC standard, rather than the traffic systems of its satellite radio partners, Audiovox officials said they could get their product to market faster and reach more markets using the broadcaster's existing infrastructure.

The monthly service is available in the top 48 markets, where Clear Channel turned on the service Jan. 4. It does not own stations in Puerto Rico or Kansas City. The partners plan to expand to 90 markets by the end of the year. The satellite companies reach the top 20 markets with traffic data, although both plan to expand their services.

Icons

Hannes Luettringhaus, product manager for Siemens VDO, demonstrated the system at CES. It uses icons to tell the user if there's an accident and suggests alternate routes. The user can vary how the incident information is presented — for example, by distance from the car or the destination.

"You've given (drivers) a reason to use it," Malone said. "It will be the first thing they turn on, right after their radio."

Audiovox estimated the potential sales of the product at 130 million units, the driving-age population in the 48 markets.

Tom Malone, Audiovox senior vice president of marketing, said of the OEM and aftermarket navigation niches, "It's a good category, but not a great category. It doesn't drive a lot of sales yet."

You've given (drivers) a reason to use it. It will be the first thing they turn on, right after their radio.

— Tom Malone, Audiovox

Malone said navigation is a tough sell to consumers because they don't see the daily relevance of the product. The partners hope that by incorporating the real-time traffic data, which is refreshed every two minutes, the product will be more applicable to the public.

Terms of Clear Channel Radio's relationship with Siemens VDO and Audiovox were not disclosed, although partners told Radio World they would share revenue from systems sold.

The service has performed well during tests, Littlejohn said. The company had been working on the project for about six months.

GUEST COMMENTARY

Reams, Debating Surround

Neural Exec Says Stations Need an Upgrade Path That Works With Existing Equipment and Content

Robert Reams, co-founder and chief technical officer of Neural Audio, responds here to an article by David Frerichs of Coding Technologies in the Dec. 1, 2004 issue.

This is one is a series of commentaries from companies adapting surround sound technology to radio.

First of all, I want to thank Mr. Frerichs for the time he has put into the promotion of 5.1. It is obvious that 5.1 is becoming an addition to the broadcaster's cache of technologies.

There is still some confusion regarding Neural technologies. I want to briefly address such misconceptions (again) regarding Neural Audio's spatial coding system for broadcast.

That being said, let's address some of Mr. Frerich's comments:

"Any successful surround sound technology for HD Radio needs to have the following features: backward compatibility with existing radios (good for both single-program and multi-program stations) and scalability from 'pseudo surround' to true surround impact on radio stations. It must also be built with industry collaboration."

There is nothing to disagree with here. Neural's watermark approach achieves fully forward and backward compatibility and *is* scalable, when appropriate, to completely transparent recovery of the original content. In addition, Neural believes that "compatibility" includes analog and tandem coded paths.

As far as industry collaboration, Neural has been in public collaboration (on the broadcast side) with XM, Harris, NPR, Infinity, Clear Channel, Ibiquity and *Coding Technologies* for several years. Noted engineers and Tonmeisters have contributed heavily in this process. Power users such as Mike Pappas of KUVO, Jan Andrews of NPR and David Casey, formerly with Infinity Seattle and now with Neural, and a long list of contributors supply an endless stream of precious information from the field on how to improve this system.

"HDC Surround can achieve a single-stream 5.1 surround sound broadcast in a single HD Radio Main Audio Program."

Yes it can. It cannot, however, function (with side information intact) within a real-world radio station infrastructure. The radio station will have to completely retool.

"The demo at the NAB Radio Show used an 80 kbps stereo core with 16 kbps of surround for a true surround experience."

David, surely by now you understand the value of data to the broadcaster. Removing that much data from content that will never benefit from it is not a good value proposition for the broadcaster.

Robert Reams

"... HDC Surround systems can be deployed into today's digital radio stations without requiring a complete overhaul. The last thing stations want to do is throw out all their existing equipment just to upgrade to 5.1 audio."

There are two problems here.

The first problem is that Mr. Frerichs proposes that HDC Surround doesn't require a complete overhaul. This is simply not true. How do you move the 5.1 around the plant? How do you edit it? What about analog mixers and stereo editors? How about stereo STLs? How about the server and automation system?

The second problem has to do with "upgrading to 5.1 audio." Legacy stereo content is going to be with us in the foreseeable future. It's not about upgrading, it's about interoperability. Analog, digital, lossy, linear, stereo and 5.1 must co-exist within a unified operating system for the time being.

Don't get me wrong, I think the newer technologies are fantastic, I just don't think that analog, stereo and linear formats are going to suddenly evaporate. They must be contended with.

"This reality has been the primary driver of pseudo-surround technologies like matrix audio and watermark audio. While admittedly easier to deploy, their results are not the best and cannot scale up to provide a true surround experience."

I challenge Mr. Frerichs to define the magical threshold where surround ceases to be "pseudo" and becomes "true." While he's at it he can change the word "easier" to "possible."

Someday, broadcast stations, as we know them, may make the transition to all digital facilities employing a world standard format. Until then the Neural system is the only technology offering seamless, reliable and complete interoperability while meeting the consumer's expectation of what is considered discrete 5.1 surround sound.

"Due to the stereo-mixdown nature of HDC Surround, stations can be HDC Surround-enabled through additions to the existing stereo chain, not a replacement of the entire system."

I believe that Mr. Frerichs is referring to the radio station *post*-exciter. He *can't* mean that downmixing by itself is an adequate method of getting 5.1 through the "entire system." There is no explanation of how the side information is reliably transported through existing "pipes" which could be lossy, analog or just not correctly formatted.

This is why Neural rethought this approach years ago. Side information approaches yield good performance until the side information is *gone*. Watermark embedment, however, survives under the same scenarios because the spatial information is contained in the *audio waveform*. As NPR proved, the audio will fail before the watermark does.

"In the end, stations and equipment manufacturers need to decide whether they want the quick fix of a solution limited to matrix and watermark, or a long-lasting solution like HDC Surround which can also leverage the digital nature of HD Radio for maximum benefit."

Referring to an *enabling technology* that is ready *now* as "limiting" while calling an *unproductised technology* "long lasting" is great marketing, but it's not going to get the broadcaster on the air with 5.1. I do, however, agree that digital radio and 5.1 surround, together, makes sense.

In closing, I would challenge Mr. Frerichs to take a walk through a real-world radio station and observe its innermost workings. I entreat him to understand the flow of content from the many imperfect sources through the studios and audio mixing console in various stages of upgrade and into the servers and automation where it is played out through processing that may represent the very history of the station.

I think he will see that technology as applied to the radio station is that of continuous evolution. With the exception of formats, there is no sudden and gigantic change, there is but transition accomplished in thousands of tiny incremental but complementary stages. It is within this environment that we must invent and apply our technologies; to do otherwise is to fail the broadcast personnel who toil endlessly, daily, nightly to achieve the best possible value for their station without even a second of "dead air."

Reams is co-founder and chief technology officer for Neural Audio. Reach him via e-mail to robert@neuralaudio.com.

RW welcomes other points of view to radioworld@imaspub.com.

Powell

▶ Continued from page 1

published accounts that she intends to leave the agency soon.

While other names outside the agency were bandied about in press accounts and by sources as possible successors to Powell, nearly all industry experts felt that a Martin or Abernathy appointment, at least for an interim period of time, would be less disruptive to the agency, and ultimately, to the industries they regulate.

Uncertainty

"If there's a lag time in getting a new chair confirmed, which could happen, then I think it's possible some items could be delayed," said Frank Jazzo of Fletcher, Heald and Hildreth.

During Powell's tenure as chairman, the indecency debate put his name in the headlines, especially after Janet Jackson bared her breast during a Super Bowl halftime show.

When Powell came to the FCC eight years ago as a commissioner, he spoke often of his support for the First Amendment, and said he didn't think it was government's place to regulate program content.

In terms of just the sheer volume of inspections and violation notices, it's really stepped up.

— Milford Smith, Greater Media

But under pressure from citizen groups and Congress, which introduced several bills to raise broadcast indecency fines, the Powell FCC increased the amount of fines and their frequency. Several radio broadcasters last year reached settlement with the FCC, paying record-setting amounts.

Because of the crackdown, many broadcasters pulled questionable programs, installed profanity delay equipment and instituted "zero tolerance" policies on indecency.

Several sources don't believe this regulatory climate will change soon.

"I think it's going to continue. The political pressures are completely outside of Powell's control and he was reacting to political pressures on indecency," said Womble Carlyle's John Garziglia.

Another communications attorney, who did not wish to be named, said, "I really think Powell despises the government regulating indecency, but he was pushed to the brink by Copps and Adelstein, and ultimately by Congress, and he said, 'Okay, I'll do my job.' And then he took all the heat for it."

See POWELL, page 22 ▶

Powell

▶ Continued from page 22

Democratic Commissioners Michael Copps and Jonathan Adelstein were also divided against their Republican colleagues in crafting new media ownership rules.

The issue broke down along party lines with the Republican majority favoring loosening the rules.

Ownership rules quandary

A federal appeals court sent most of the rules back to the FCC for better justification. One notable rule that changed was the definition of what constitutes a radio market. The court allowed the commission to enact a change to Arbitron Radio Metros rather than the contour overlap method. At last report the agency was still working on a definition for unrated markets.

Experts differ over whether trying to redo all the media ownership rules at once was wise.

"The fact that it was controversial, and affirmed only in part and reversed in large part by the Third Circuit (Appeals Court), are immaterial. The fact is he undertook what no commission ever attempted to do: harmonize multiple ownership across all media," said attorney John Wells King of Garvey Schubert Barer.

Garziglia said that while Powell's goal of trying to wrap all the ownership rules into one neat package was laudable, and the chairman was trying to accomplish what he was directed to by the courts, unfortunately, "He couldn't get it all in the box. Therefore, we're going to be wrestling with ownership issues for many years to come."

So many factors affecting ownership, he said, are in play — such as the courts, the review of the Telecom Act and what the FCC itself does — that "Nobody can predict with any degree of certainty what the ownership rules are going to look like two years down the road."

Another hallmark of Powell's tenure was that the FCC increased enforcement of its technical rules with more fines issued for violations concerning RFR emissions, lack of EAS equipment and tower lighting.

"If you routinely go through the public notices, and compare it with a few years back, in terms of just the sheer volume of inspections and violation notices, it's really stepped up," said Greater Media Vice President of Radio Engineering Milford Smith.

News of Powell's impending departure saddened at least one agency employee, who credited the 41-year-old with increasing the professionalism of the FCC. "It's a different place," said this source.

Under Powell, the commission recruited more technical employees; it hired 63 more engineers and invested $3 million in lab facilities since 2001.

Powell was seen as a gadget guy who was sincerely interested in the technologies he regulated. For example, during a press tour of the commission's new anechoic chamber in Columbia, Md., last summer, Powell hung around after he dedicated the new lab to speak to reporters about experiments being conducted at the facility involving such technologies as WiFi, Ultra wideband and BPL.

Photo by Leslie Stimson

Powell chats with Commissioner Adelstein before a recent public meeting.

At the CES show in January, at what was likely his last appearance at a trade show as chairman, Powell listed for CEA President/CEO Gary Shapiro the goodies he had bought for himself and his family over the holidays: a TiVo for his children, so they would stop using his; and a pair of Bose noise-canceling headphones for himself. He joked these were to wear on planes so lobbyists would stop bothering him.

Powell was credited as being a "big picture" kind of chairman, one who saw radio in a world in which other technologies competed for information and entertainment mechanisms such as satellite radio, Internet streaming and iPods.

Jazzo said Powell's legacy as chairman includes efforts to promote competition, particularly as he increased

See POWELL, page 25 ▶

Dave Scott Retires From Scott Studios

TM Century Veteran Closes Another Chapter; Automation Firm Now in dMarc's Hands

by Paul McLane

Dave Scott has retired from the automation companies he founded.

In October, Scott had sold his three companies — Scott Studios Corp., Computer Concepts Corp. and Scott Concepts Corp. — to dMarc Broadcasting. At that time, the new owners had said Scott planned to retire in three years.

Dave Scott

Ryan Steelberg, president of dMarc, told Radio World in January that integration of the firms had gone more quickly than expected. Scott now retires from full-time operation and management duties; he will remain as a consultant and "product architect."

The announcement marks the end of another chapter in Scott's storied 46-year radio career, which, before he entered automation, was already notable for work in programming and other fields.

Cravings

Scott, 61, said radio is in his blood, and it doesn't sound like he'll be sitting on a porch somewhere.

"I'm not sure how I'll satisfy my radio cravings. It will be a while before I even have time to figure that out," he wrote in an e-mail. "I'll probably see you in the aisle at the NAB Show in April, just not as an equipment exhibitor." Scott departs the company under a non-compete agreement.

From his official biography:

"Dave Scott has been an announcer, chief engineer, program director and part-owner of stations in both small and large markets. He has submitted over 80 technical broadcast improvements that were accepted by the FCC. For 17 years, Mr. Scott was CEO of a radio programming firm, TM Century, and was an announcer on program formats aired on over 400 affiliate stations.

"Mr. Scott's programming inventions include GoldDisc digital CD oldies libraries, HitDisc weekly CD compilations, SuperCarts music libraries, contests, comedy services, production and jingle packages used by thousands of radio stations."

Asked by Radio World to reflect on the achievements of Scott Studios, Dave Scott ticked off a list of accomplishments.

"Back when digital systems only ran satellite formats, we were first to make music on hard drive work," he wrote in an e-mail, "first with a right-brain, DJ-friendly GUI screen (in the DOS geek era of left-brain software); first at merging music and spot logs with finesse; first with pre-dubbed startup music libraries; first with cart walls of music sorted by title, artist, year, length, tempo, category and with alpha touch-screens to jump to particular songs in a second; first with hot keys for instant play of jingles; first with Internet transfers of recordings to distant cities; and first with 'hear it like it is' voice tracking with song heads and tails in headphones."

He also cited the creation of a talented staff with low turnover.

"Without being cheapest or losing money on deals to buy numbers, we gained 4,600 U.S. stations on our system," he said. He described the staff as mostly former DJs, engineers and managers with a passion for good radio. "I built the company to run well even if I got killed in an accident; (and) I know dMarc will do a great job."

Company plans

Ahead for the company under dMarc, Ryan Steelberg said customers can expect the firm to add new products shortly; further emphasize its initiative to help clients comply with Sarbanes-Oxley requirements; and add support to the Maestro side of its offerings.

He said the company had made a "significant investment" to "get the Maestro line going (again) quickly." That line had been added by Scott through its earlier acquisition of Computer Concepts. "It's a good product and we're very committed to it," Steelberg said of Maestro.

He indicated dMarc would pursue network- and broad-based solutions for clients, based on dMarc's background in distributing centralized computing systems and IT.

In the wake of Dave Scott's departure, Steelberg said, Dennis Christensen will head up the Scott Systems and SS32 product lines; Dave Alexander is general manager for Maestro. Lisa Ackerly is the company controller. All three were Scott veterans.

Recently added is Daryl Webster as vice president of customer support; he had worked at Prophet Systems. He reports to dMarc Vice President of Media and Operations Scott Bogdan.

Meet the Steelbergs

Chad Steelberg is CEO; Ryan Steelberg is in charge of sales, marketing and business matters. The brothers are the principals, operators and owners; the company also has investments from two large private equity groups, Oryx Capital and King Street Capital, a $4 billion fund; and Steelberg said it also took in a small investment from Ad Pepper Media, a public media group based in Germany.

"Through this partnership we look to re-establish the SS32 and Maestro lines throughout Europe, Latin America and Asia," he said.

dMarc is headquartered in Newport Beach, Calif., with service facilities in additional locations. The brothers have been working together since 1994, when they launched online advertising management and distribution company AdForce. It later went public, and also won a Smithsonian award for the best technology in information services in 2000.

"We have created and operated several technology and media businesses together," Ryan Steelberg said of himself and his brother. "We have raised over $90 million in private equity, raised over $60 million in an IPO and generated over $1.6 billion in shareholder value. We came into radio in 2002 focusing on data-casting and digital solutions. Moving into and expanding on automation was part of that plan."

Photo by Paul McLane

The Steelbergs — Ryan, at left, and Chad, right — pose for photos with Dave Scott at last fall's NAB Radio Show.

The company they purchased was itself an agglomeration of earlier lines. Scott incorporated what had been Scott Studios, Computer Concepts and assets of Electric Works and CBSI/Wicks' Digital Universe. It has operations in Dallas and Lenexa, Kan., which dMarc says are unaffected by its purchase.

The automation company describes itself as the largest U.S. studio automation and digital systems provider, "with over 4,600 broadcast clients ... more in use than the number two and three vendors combined." Last fall, Scott told Radio World the new owners had $29 million in investment money available "to buy other radio companies to dovetail with Scott."

Powell

▶ Continued from page 23

broadband services, and introduced new technology, such as broadband over power lines.

"Powell pushed competition as a substitute for regulation," said Jazzo.

This contrasts with the style of predecessors Bill Kennard and Reed Hundt, both of whom are Democrats. Kennard focused on liquor ads, particularly early in his tenure, and the creation of low-power FM, while Hundt zeroed in on kids' TV issues. Hundt's FCC was also charged with implementing the mechanics of the '96 Telecom Act, translating what Congress wrote into policy.

"It doesn't seem like there should be any reason for a lengthy delay. That's our hope."

Ibiquity Digital President/CEO Robert Struble was like-minded, and remained hopeful the FCC would address outstanding issues for HD Radio by mid-year.

Struble said Powell's greatest accomplishment was the initial IBOC authorization of 2002.

"That Report and Order really enabled market development."

Timing

Powell was appointed to the commission by President Bill Clinton in 1997 and named chairman by President George W. Bush four years ago. After denying rumors he would leave for more than a year, Powell announced his intentions the day after Bush's second inauguration.

We believe the transition to digital is picking up momentum and that it is still a question, not of 'if' the commission will approve multicasting, but 'when.'

— Mike Riksen, NPR

Several sources were optimistic the change at the top wouldn't affect the FCC's timetable for authorizing the remaining HD Radio items such as supplemental audio and AM nighttime.

"It's probably understandable that the chairman's announcement might create a temporary distraction from the commission's normal business, but we believe the transition to digital is picking up momentum and that it is still a question, not of 'if' the commission will approve multicasting, but 'when,'" said Mike Riksen, NPR vice president of government relations.

In a statement to his colleagues Powell said: "Having completed a bold and aggressive agenda, it is time for me to pursue other opportunities and let someone else take the reins of the agency. ... The seeds of our policies are taking firm root in the marketplace and are starting to blossom. The use of cell phones, digital televisions, personal video recorders and digital music players is exploding. These devices are increasingly connected anytime, anywhere by a wide variety of broadband networks enabling a host of competitive services and new applications."

Reactions to the news varied.

NAB President/CEO Eddie Fritts stated:

"While we have shared occasional policy differences, I have nothing but the utmost respect for the intellect, passion and good humor that he brings to the job. Michael will succeed in whatever endeavors are ahead."

Powell's deregulatory focus, especially his handling of media ownership rules and the indecency crackdown, garnered him critics, especially from citizen groups.

Gigi Sohn, president of Public Knowledge, stated: "Michael Powell ... was among the smartest and most pro-technology chairs the agency has ever had. However, as in the case of the hyper-regulatory 'broadcast flag,' he sometimes allowed politics to get in the way of his pro-tech and deregulatory philosophy. To the extent that we expect the next chair to share Mr. Powell's philosophy, we hope that he or she will apply that philosophy consistently, even at the risk of angering large, powerful media companies."

Senate Commerce Committee Chairman Ted Stevens, R-Alaska, expressed regret that Powell would not be at the helm of the FCC as his committee begins the review of the '96 Telecom Act.

Ferree

Media Bureau Chief Ken Ferree also intends to leave the agency in March.

Powell appointed Ferree as Media Bureau Chief in a reorganization in 2001 when the Cable Bureau and the former Mass Media Bureau were combined. Former Mass Media Bureau Chief Roy Stewart became head of the Office of Broadcast License Policy within the bureau.

Ferree had been head of the Cable Bureau. Ferree's exit is effective March 4.

Where No Radio Has Gone Before

A Look Back at Surround's Development While Radio Was Avoiding the Technology

by Skip Pizzi

Last issue we began a review of surround sound's history, under the premise that understanding past processes is useful in predicting future outcomes. Today we'll consider the helical road that surround sound technology has taken to arrive at today's status, and how radio has been left out of the picture to date.

Remember that what we now call surround sound began life as quadraphonic sound, with its first incarnations appearing in the music industry, as described in the previous column. (For those really keeping historical score, the first "quad" music actually appeared in the soundtrack of the movie "Fantasia," released by Disney in 1940, but this so-called Fantasound system used synchronized projectors — one for image, the other for sound — with three audio tracks sent to five speakers, three in front, two in the rear. It was never really commercialized beyond this single movie's application.)

The death of quad

When we last left our heroes, they were valiantly engaged in a format war among three different quadraphonic release formats: SQ, QS and CD-4. The elegance of the 4-2-4 matrix approach shared by SQ and QS was a great advantage, but CD-4's discrete quad technology was more impressive, at least under optimum conditions. This stimulated the matrix camp toward improved performance.

Next steps from these purveyors included smarter decoders such as Sansui's Variomatrix for QS, and the Tate (or Fosgate) matrix for SQ, which sensed dominant signals in the program and reacted adaptively. These techniques, later generically referred to as "steering," improved the effective separation between channels in matrixed signals during playback.

Even though these enhanced matrix decoders still didn't match the separation of CD-4, the latter's extreme demands on the vinyl medium and its less forgiving nature overall ultimately outweighed its potentially greater performance, and matrixed systems took the lead. UD-4, a "successor" to CD-4 developed by Denon and released briefly in Japan, never appeared in the United States.

The alliances formed by each record label choosing a quad format also played an important role in the format battle, with RCA being the only major label supporting CD-4 (remember it was developed by the associated JVC). While a few smaller labels supported the QS format, Columbia Records' support of its affiliated CBS Labs' SQ system, along with that of several other labels, allowed it to predominate.

Nevertheless, by the late 1970s consumer interest in quad overall had waned to the point that the form stagnated, and when the industry moved into digital technology with the launch of the CD format in the early 1980s, stereo was the only mode supported.

The post-mortem for quad cited numerous reasons for its demise. Most plausible were consumer confusion, lack of critical mass from the existence of multiple formats and the relative lack of quad content. Even the most supportive labels produced quad remix versions of only their most successful records in their catalogs, and released new quad recordings from just the most high-profile of their artists. At the height of the quad era, the vast majority of records were still produced and released only in stereo.

Another reason occasionally referenced for quad's failure is its lack of any real traction in the radio business (remember FM *stereo* was itself still fairly new to many stations and listeners), and the fact that no broadcast technology specifically supporting quadraphonic reception was ever deployed.

Of course, matrixed quad could be passed through a stereo FM broadcast chain, and relatively successfully decoded by listeners equipped with the proper matrix decoder in their home listening systems; but there was never more than lukewarm support for this in the consumer electronics industry. Aside from a few "quad receivers" briefly marketed by a couple of manufacturers, listeners who wanted quad reception from matrixed content generally had to "roll their own" systems, using the fairly unwieldy arrangement of feeding a stereo tuner's outputs to an outboard matrix decoder and then on to four channels of amplification and speakers.

The supersonic carriers on CD-4 records prevented passing their quad content through the ~15 kHz-limited FM system. Moreover, DJs disliked the format because of the audible sweep tone that its 30 kHz subcarriers produced as turntables came up to speed. These carriers also made CD-4 discs difficult to cue — almost impossible on songs that started quietly — because they were generally "on" throughout the disc even though they had no modulation during silence.

These issues, coupled with the overall dearth of quad LP releases, failed to stimulate radio broadcasters to air much quadrophonic content, which indeed may have assisted in escorting the form to an early exit.

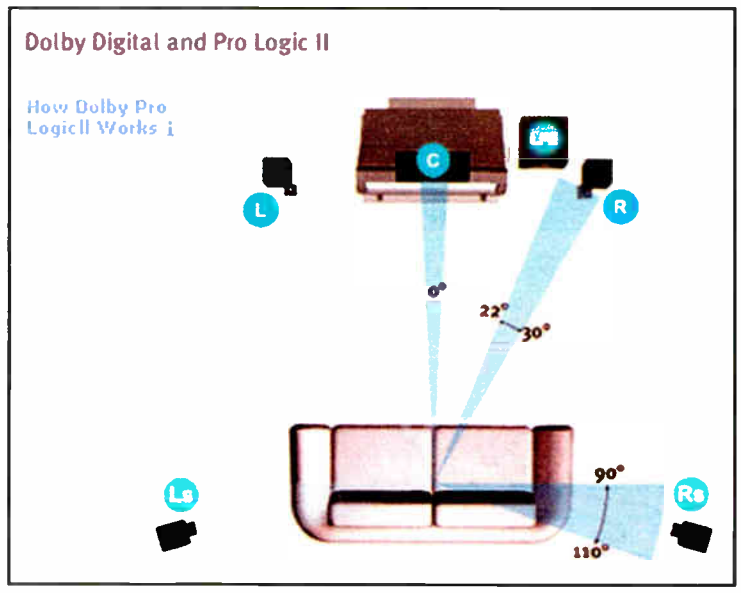
Shifting the space

As we all know, however, matrixed quad resurfaced successfully in the cinematic environment.

In fact, for the next 20 years or so, the technology developed within the movie and TV-audio industries, not the music or radio environments. Quad became surround, and has only recently begun to reappear in the music and radio worlds.

This movement began in earnest as Dolby Labs licensed the same Scheiber matrix used by quad formats, adding its own twists for application to sound-for-picture in movie-theater sound systems, which began to appear in the mid-1970s. Instead of quad's four-cornered box, Dolby reshaped the four channels as left, center, right and surround (L, C, R & S), where L, C and R speakers were all set as "front" sources placed behind the cinema screen, and the S channel was reproduced by multiple speakers distributed around the rear and sides of the theater, producing a diffuse effect from what was actually a single audio signal.

Dialog generally was assigned to the C channel to keep it centered to the picture, while music and sound effects were generally assigned to L and R (plus C when appropriate), with only ambience and reverb — and the occasional sound effect — assigned to S.



The typical home theater surround sound setup uses six speakers. For matrixed surround content, Ls and Rs are fed by the same audio channel, and LFE is derived by the decoder. In 5.1 surround, each speaker is fed by a discrete channel in the content. (Courtesy Dolby Labs)

Dolby accommodated the relatively low level of audio in the S channel by band-limiting the high end of the S channel and adding Dolby-B noise reduction to it. (Remember that this was still deep in the analog era, and film sound generally was carried on optical stereo tracks printed in the same photographic process as the picture onto release prints.)

The results were welcomed warmly by the cinema industry and theater goers alike, and Dolby Surround, as the format was called, soon became the norm for major motion picture sound in theaters and 35 mm release prints. It also didn't hurt that one of the first pictures released in Dolby Surround was "Star Wars," and that film's surprise runaway success, including its notable soundtrack and SFX, helped in the early establishment of the format.

Meanwhile, Dolby also developed a discrete six-channel magnetic audio format for theater sound, but this was limited to occasional blockbuster releases on 70 mm prints (which included a magnetic tape stripe coating alongside the film's optical image area). This arrangement added a second surround channel (i.e., left surround and right surround channels, each still intended for reproduction via multiple speakers, but now wired as two separate sets on opposing sides of the theater's side and back walls), and a dedicated "boom" channel for low-frequency effects (LFE, sent solely to subwoofers). Thus the channel lineup in this format was L, C, R, LS, RS and LFE.

This was the genesis of what we today call "5.1 surround," which has since become standard in digital audio for video formats and is gradually working its way into the audio-only environment via such formats as DVD-A and SACD. (The six-channel format was ultimately renamed "5.1" because the LFE channel required only the lowest octave — occupying about one tenth the bandwidth — of the other full-range channels. More on digital surround next time.)

The much higher cost of 70 mm release prints and projectors relegated the six-channel discrete format to few films and theaters, so the matrixed optical Dolby Surround format became the method of choice for film soundtrack sound of the day. Its backward compatibility to legacy optical-projection and mono- or stereo-sound systems in theaters only increased its speed of adoption by filmmakers.

TV adopts what radio ignores

The popularity of matrixed cinematic surround meant that nearly all major motion pictures released since the late 1970s included such a soundtrack. Thus when Beta and VHS videocassette formats added stereo capabilities with their respective "Hi-Fi" upgrades in the early 1980s, video rentals and sales of movies began to include stereo soundtracks, which in turn included matrixed surround information.

This was not really an intentional feature, but simply occurred because the release prints used to master videocassette releases happened to include this encoding already in their optical stereo soundtracks.

The consumer electronics industry took great advantage of this circumstance, however, and consumer surround decoders began to proliferate. So began the home theater revolution, with easy access to the same Dolby Surround soundtracks that were once the sole province of movie theaters. As matrixed quad had done earlier, Dolby soon updated its consumer decoder designs with adaptive steering under the name of Dolby Pro-Logic, which provided much-improved imaging. A derived subwoofer output also was provided for more elegant bass management in home surround systems.

All the while, radio remained unaffected by this activity, and to this day lingers staunchly as a mono or stereo medium. In fact, Dolby Labs has placed limits on the licenses for its matrixed surround decoders intended to inhibit their use with integrated FM receivers, including all car audio systems. (To wit, while Dolby Surround does appear in some factory-installed automotive sound systems, it generally is limited to use with local playback sources, and is defeated when the tuner is selected.)

And even as radio broadcasters have considered their own conversion to digital broadcasting, the audio systems involved have been designed for stereo or mono use. Whether this will change is an item of ongoing current discussion.

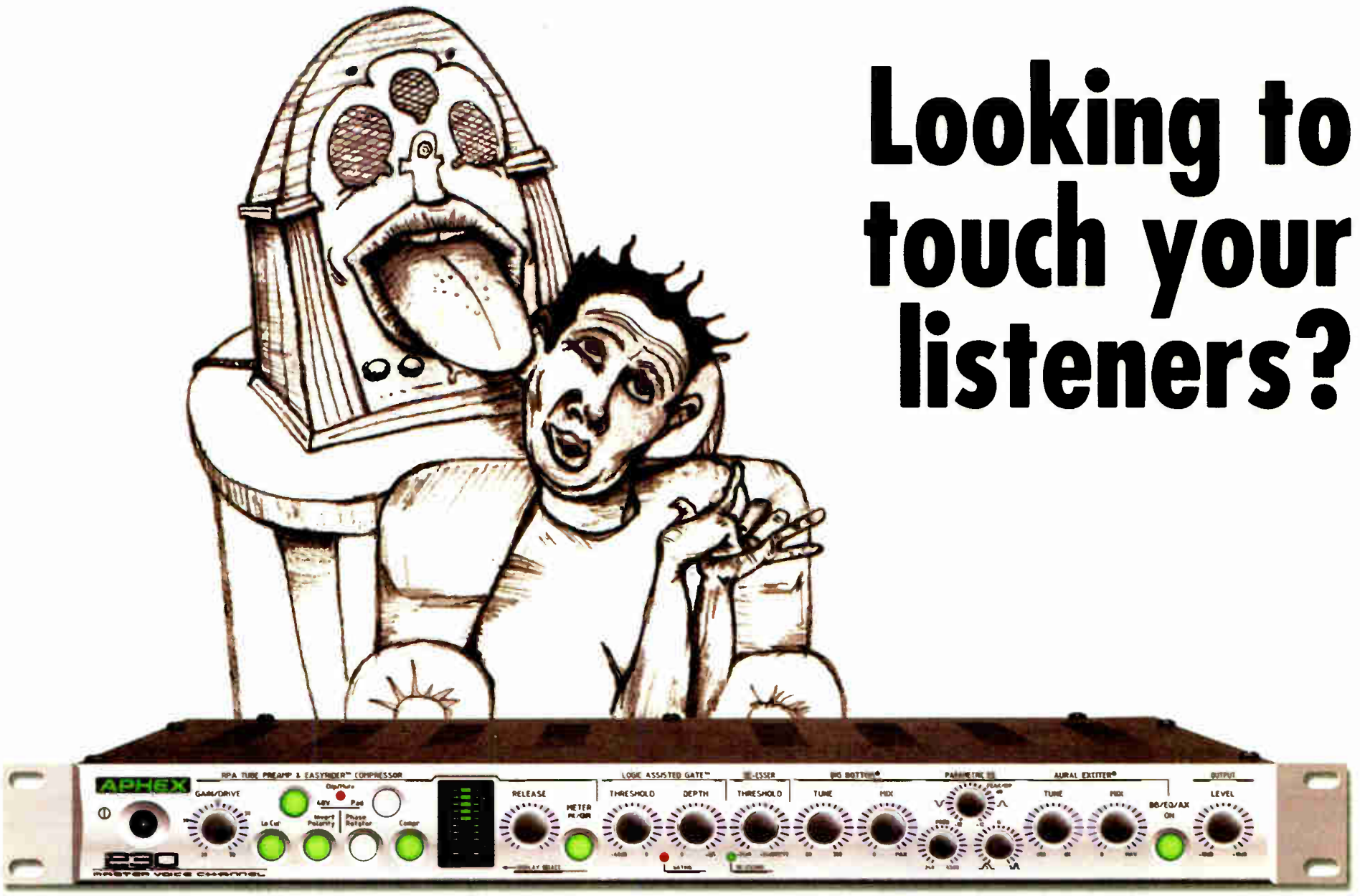
Next time we'll pick up the story of surround sound's development with the entrance of digital audio and data compression systems, and take things to the current day's consideration of a possible surround capability for radio at last.

Skip Pizzi is contributing editor of Radio World.

The Big Picture

Photo: Gary Hayes, BBC

by Skip Pizzi

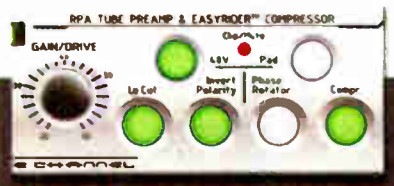


Looking to touch your listeners?

APHEX MODEL 230 MASTER VOICE CHANNEL

Introducing the Aphex Model 230 Master Voice Channel, the most powerful processor ever designed specifically for voice.

Voices will be bigger, more present, more intimate, more intelligible and more consistent. Its comprehensive complement of exclusive proprietary features brings these benefits to any voice – from a thundering bombast to a whispering waif – without changing its essential quality.



Every element of the Model 230 is superior to any other voice processor's similar function...

- The RPA™ tube preamplifier provides warmth, image and detail.
- The Easyrider® Compressor controls output levels without pumping or breathing.
- The Logic-Assisted™ Gate won't false trigger or cut off words.
- The Split Band De-esser effectively cuts sibilance without dulling.
- The Big Bottom® and Aural Exciter® add resonance, depth, presence and clarity.
- The parametric EQ takes care of any frequency anomalies with surgical precision.
- Post-processing insert point, -10dBV and +4dBu analog outputs, 24/ 96 digital outputs on AES3, S/PDIF and Optical, word clock I/O, and a cough switch with soft mute allow the Model 230 to be easily interfaced into any system.

So if you *are* looking to touch your listeners, you should be looking at the Aphex Model 230.

www.aphex.com

Genuine APHEX

MILESTONES

The CBS Audimax and Volumax

One in a Series of Occasional Looks Back at Important Devices and Practices in Radio Broadcasting

by Charles S. Fitch

In a previous article we spoke of the elimination of the transmitter watch engineer. One important task this person faced was continually to adjust audio levels into the transmitter to avoid over- and under-modulation.

To allow the newly minted "combo man" to focus on creative efforts and to keep average modulation as high as possible, automatic audio level control devices — limiters and compressors — became standard equipment in stations starting in the 1950s, replacing the watchman's hand.

None of these boxes was more successful during that period than the CBS Laboratories Volumax limiter and the Audimax, a platform-type smart AGC.

CBS Labs was the technical research and development arm of the Columbia Broadcasting System. Headed by lead scientist Dr. Peter Goldmark for most of its existence, the lab was expected to keep CBS technically ahead of its competitors. The company hoped that the sale of some of that advanced technology, such as the Volumax and Audimax, would make the effort profitable as well.

The first units were designed with tubes; but few were sold, as they cost nearly as much as a contemporary Ford or Chevy automobile.

Level-headed

These were updated by the successful, more cost-effective 400 series. Using early solid-state silicon transistors and a balanced amplification scheme, these boxes achieved level control by changing the bias on an intermediate stage's transistor bases, essentially varying the amp gain.

Well designed and built, they were easy to service, with each subsection on its own PCB. Input and output were transformer-coupled. The overall gain was sufficient to make up for all but the loss of the worst telco audio circuits.

The Achilles heels of these units were the 600-ohm, T-configuration wirewound variable attenuators on the input and output. They were noisy from day one. Replacements are nearly impossible to find today.

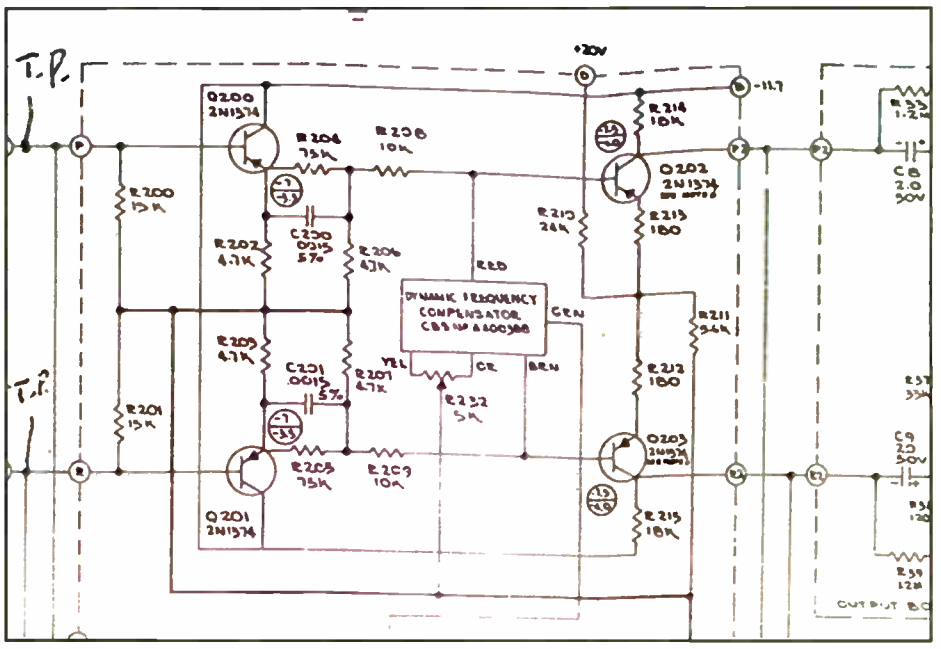
The AM Volumax had a nifty but primitive asymmetrical diode clipper scheme to achieve higher positive modulation.

The FM Volumax was probably the first limiter to level the pre-emphasized portion of the upper end audio above about 2 kHz in a separate sidechain gain controller. The result was a more natural audio leveling that was not bottomed or "plunged" by a random high-end audio component like a record pop (remember records?).

A little lazy, the FM Volumax attenuated any peaks that got by via soft clippers made of complimental zeners on the line-level output.

The 400 series gave way to the functionally similar, yet smaller, single-rack-unit 4000 series. For this compactness, the T pads and input transformer were eliminated.

A mono Audimax is shown with a companion Orban 319. Note the gentle warning to passerby on the Orban.



Every Volumax and Audimax had at least one 'mystery module.' This section of FM Volumax schematic shows a Dynamic Frequency Compensator, part of the high-frequency control sidechain.

Mystery inside

It's hard to kill the CBS 400s. WTIC(AM)'s Volumax was probably the most famous. It carried that station in Hartford, Conn., through at least 10 ratings books as No. 1 against intense competition. Still reliable after refurbishment, it now controls the audio at HRRZ in Juticalpa, Olancho, Honduras.

The Volumax and Audimax are remembered as well for their mysterious sealed circuit modules. In the industrial manufacturing universe, patents and trademarks protect published processes, techniques and devices. As further protection, a firm is allowed to have secret processes and circuits such as the exact formula for Coca-Cola and the sealing glue used in Raychem shrink warp.

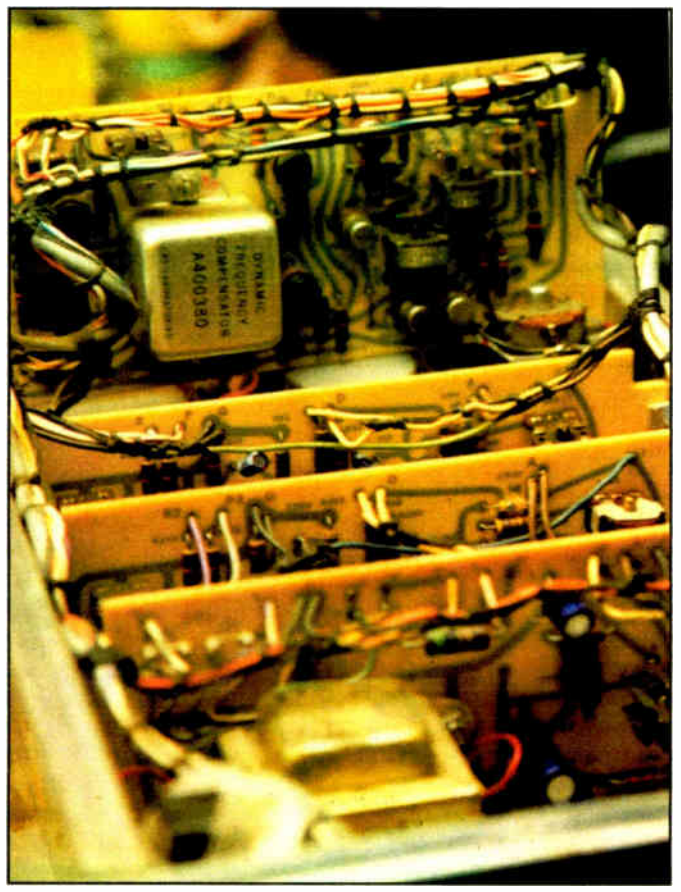
CBS Labs chose to encapsulate certain parts of its circuitry in potting compound inside small metal enclosures — probably not an original gambit, but it started a fashion in the electronics industry still seen in some Orban products, among others.

Tame by today's loudness standards, the Audimax had an effective control window of about 20 dB, with a gated resting position near the mid gain point. The Volumax was a 4-to-1 limiter.

Designed to work as a pair, dynamically these boxes functioned well together, raising the uniform audio and modulation standard of broadcast performance — at least until the Optimod.

Tell us your memories of the Volumax and Audimax. E-mail us at radioworld@imaspub.com.

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



Interior card cluster of an FM Volumax with the control card pulled to expose the mystery module.

MARKET PLACE

Bird Expands Site Analyzer Series

Bird Technologies Group is touting the 6 GHz diagnostic range of its new SA-6000EX.

This is one in its EX Series of Site Analyzer antenna and cabling diagnostic tools. The diagnostic range of the field unit is 25 MHz to 6 GHz. "This unprecedented bandwidth capability dramatically increases the number of diagnostic applications that can be supported by a single field unit," it stated.

The unit also has a 300-trace memory, better frequency resolution, source VSWR of 1.12 to 1, VSWR range of 1 to 99.99 and a greater low temperature operating range.

For information, call the company in Ohio at (440) 519-2062 or visit www.bird-electronic.com.

Have Internet Radio Receivers Arrived?

by James Careless

Before the dot-com bomb exploded at the turn of the century, Radio World and other trade publications spent a lot of space investigating "Internet radio receivers." These were freestanding units capable of tuning and reproducing streamed audio without the intervention of a computer or Web browser.

Back then, the product deemed Most Likely to Succeed was the Kerbango Internet Radio. But Kerbango was purchased by 3Com in 2000. The dot-com bomb subsequently exploded, and a cash-poor 3Com killed Kerbango and many other projects in an effort to regain fiscal stability.

In contrast, the standalone Sonicbox Internet Radio did make it to consumers. Essentially a wireless unit that relayed a computer's output to a stereo tuner or headsets, the Sonicbox's iM Network technology was released commercially in a Sonicbox-branded unit and a line of Philips' boomboxes.

The catch was that the Sonicbox technology relied on a specific Web site to provide a dedicated stream of stations, rather than surfing the Web directly for streaming audio. Unfortunately, as one Sonicbox owner explained in a review on Amazon.com, "Alert ? the Web site that this hardware needs is DEAD." The caveat is an important one: neither *www.sonicbox.com* nor *www.imnetworks.com* is still active.

The Noxon Audio

Enter the WiFi era

Clearly, the standalone Internet radio receiver is no longer the model being pursued by those looking to tune in webcasts via their stereo.

However, the concept of transporting streaming audio from the desktop to stereo receivers has not vanished. It has simply evolved, thanks to the advent of WiFi (IEEE 802.11b/g) wireless networks.

As anyone with a wireless home network knows, WiFi makes it possible to connect numerous computers and peripherals together using short-range wireless; allowing them to share files, printers and even Internet access.

It is obvious that WiFi similarly could be used to connect a stereo receiver to streaming audio by broadcasting an audio stream from an Internet-connected PC directly to the receiver.

Add a WiFi card and audio codecs to a standalone box, and it can connect the receiver directly to the Web without the need for a PC. If an audio reproduction unit and speakers were added to this same standalone box it would become — that once-ideal — an Internet radio receiver.

Relaying streaming audio

But based on the examples now coming to market, makers of "WiFi receivers" are not adding audio reproduction circuits and speakers to their units.

Instead, they are sticking to the concept of relaying streaming audio from the Web to a conventional stereo receiver (or just a pair of amplified speakers), while allowing the user to tune for their favorite stations via the WiFi receiver's front end.

For example, the Noxon Audio unit from TerraTec is a stylish metal-cased box with LCD display that "can receive thousands of Internet radio stations from all over the world — in all available languages and genres," according to the company Web site.

One catch: the Noxon Audio relies on "the V-Tuner Premium Service (that) provides you with a list of all available stations." This approach has the same flaw as the Sonicbox concept: if the V-Tuner system should cease to be supported by its manufacturer, the Noxon Audio could end up using an outdated list of Web radio stations.

Over time, it would be unable to access the latest and greatest in Web audio. Still, the Noxon Audio could still access MP3 and WAV music files on the user's hard drive.

The Slim Devices' Squeezebox is another WiFi receiver that can transport a computer's music library to a home stereo, or access the Web via WiFi. Unlike Sonicbox and Noxon Audio, the Squeezebox relies on established (by Internet standards) streaming Web sites, such as Live365.com, for its streaming content.

For consumers, this approach provides some assurance that their Squeezebox will continue to work no matter what happens to Slim Devices in years to come.

Meanwhile, Philips is continuing its commitment to Internet radio, although the WiFi receivers shown on its Streamium Web site no longer trumpet their use of iM Networks technology.

Unlike the competition, Philips apparently has grasped the potential of streaming: its site includes an LCD Streamium TV capable of receiving streamed video; the MC6000i Streamium Wi-Fi wireless Home Entertainment System with speakers included; capable of 5.1 surroundsound for home theater use; and the MC-i250 Streamium Wi-Fi wireless Micro Hi-Fi System, essentially a portable mini-stereo setup.

Beyond the desktop

Strictly speaking, wireless units capable of receiving and reproducing streamed audio are widely available.

In broader terms, however, Internet radio has yet to move beyond the desktop. The reason is that the nature and scope of streaming media has expanded considerably over the last few years. For instance, the Squeezebox decodes both sound and text messages; it is not just an Internet radio receiver, but a real-time newsticker service.

What this change means to Internet radio broadcasters remains to be seen. The originality and risk that helped spark the webcasting medium were stifled by concerns about performance rights and copyright payments. Could the addition of text help revitalize this sector?

Or has the torch that Internet broadcasters once carried been passed to so-called podcasters, producers recording radio shows that are automatically downloaded by owners of iPod and similar MP3 players?

We shall see how webcasting develops. In the meantime, it is now possible to pipe streamed audio to a home stereo system without a PC. In and of itself, this is a real achievement.

James Careless is a frequent contributor to Radio World.

MARKET PLACE

Burk Extends Sales Specials

Remote control supplier Burk Technology said it would extend three product sales promotions until the end of March.

Broadcasters receive $500 back when they purchase a new Burk Technology transmitter remote control system and trade in a Moseley MRC-1, MRC-2, or MRC-1600.

When TV operators purchase three GSC3000 I/O 16 units, Burk will send a fourth free.

And customers in Canada can trade in a VRC1000 or VRC2000 remote control and get U.S. $400 back when they buy a new Burk Technology GSC3000 or VRC2500 transmitter remote control system.

For information call the company in Massachusetts at (978) 486-0086 or see the Special Offers link at www.burk.com.

Who's Buying What features recent sales and installations of technology of interest to Radio World readers. Information is from suppliers and users. Send news and photos to radioworld@imaspub.com.

Greater Media installed **Axis** network cameras and video servers in a security application in Boston. The broadcaster moved into a new 40,000-square-foot building and sought to upgrade its analog video security system while reducing reliance on a security guard. The facility houses 200 employees including many who work night shifts. It is also using the system to monitor two transmitter sites remotely.

Greater Media installed Axis network cameras and video servers in a security application in Boston.

The network video system enables monitoring of the facility and equipment from a remote location via the Internet. The system converts video streams from existing analog cameras into network video. **Milestone Systems** XProtect software provides surveillance applications. Greater Media's system incorporates **Cisco Systems** routers and switches. ...

Pulsecom said it has shipped approximately 2,000 PCAU units, with more than half of them delivered in the last year. The Pulsecom/APT Program Channel Access Unit is used for broadband audio and secure link applications; it was developed by Pulsecom and **Audio Processing Technology Ltd.** and typically is purchased by a telco provider for use by broadcasters.

"A mono circuit requires a PCAU at both ends, a stereo circuit requires two units at each end — one for the left channel, one for the right," the company's Dave Corp told Radio World. "So if we assume 50 percent of the links are mono, the 2,022 units would equate to around 675 links." ...

Klotz Digital said the first of its AEON radio on-air consoles is in service at **SLB Radio Productions** in Pittsburgh.

The facility originates a public radio program aimed at families, especially to children. "The Saturday Light Brigade" originated in 1978.

At SLB the 12-fader mixer is being used by broadcast professionals, children learning to broadcast and college students working on broadcast software and hardware evaluation at Carnegie Mellon University. The console went on air during the opening weekend at the new Children's Museum of Pittsburgh. ...

Harris said it entered into a "multimillion dollar business relationship" with **Cox Radio** for the provision of digital transmitters through 2008.

Cox has 78 stations in 18 markets. The supplier said Cox has committed to Harris for its HD Radio transmission needs over the next four years. Cox began HD Radio service with WEDR(FM) in Miami and has several stations on the air. Markets where Cox stations will convert this year include Houston, Birmingham, San Antonio, Louisville, Orlando, Tampa, Bridgeport and Stamford/Norwalk. Sterling Davis is vice president of engineering for Cox Radio. ...

Radio Prague, which broadcasts in the Czech Republic from studios in the capital, installed a **Studer** Vista 7 digital mixing console.

The digital console has been installed in a music production studio, Studio A, in Karlin, which will be used as a reference studio for small and medium-sized orchestras and bands. ...

Clear Channel expanded facilities in Charlotte, N.C., and **Wheatstone** says it won the console and routing business.

The supplier said it was awarded the job for 801 Wood Ridge Center Drive. The contract is for WEND, WRFX, WLYT, WWMG and WKKT and includes a custom audio network with two Bridge digital routers, seven studio-sized satellite routers, pre-wiring and six Generation 4 control surfaces.

Separately, the company's **Audioarts** division reported a sale of a D-16 digital console to the **Salem Group** for use in Houston. ...

Omnia Audio reported processor sales to **WBEV(AM)** in Beaver Dam, Wis.; **WPEN(AM)** in Philadelphia; **WXLA(AM)** in Lansing, Mich; and **MUST(FM)** and **Preference** in Belgium.

Sister company **Telos Systems** shipped ProFiler PC loggers to **WKRE(AM)** in Charlotte, N.C.; **KWEY(AM/FM)** in Weatherford, Okla., and **KFOG(FM)** in San Francisco; the company also provided Zephyr Xport codecs to **KBAY(FM)** in San Jose, Calif.; **WVAF(FM)** in Charleston, W.Va.; **Sirius Satellite Radio**; and **West Virginia Radio**. ...

SLB Radio Productions now originates its public radio program from the theatre of the Children's Museum of Pittsburgh, using a Klotz console. Lawrence M. Berger, left, is shown with interviewees and visitors.

Broadcast Electronics reported the purchase by **WFAE(FM)** in Charlotte, N.C., of an HD Radio package including XPi 10 exporter, which the broadcaster can use for generating HD Radio at the studio in preparation for Tomorrow Radio services.

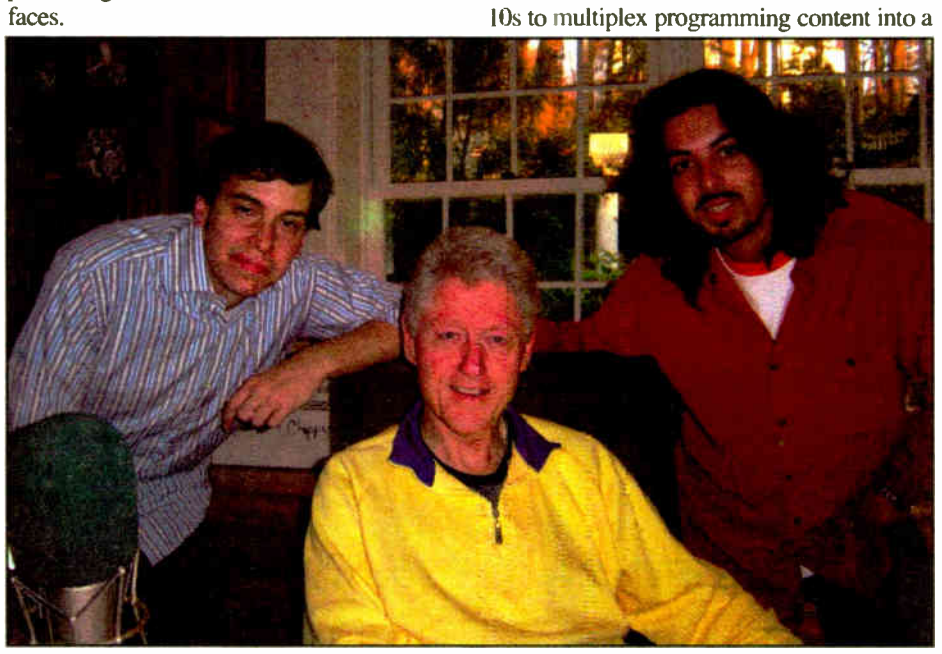
The NPR affiliate is using CPB money and will acquire two BE FMi HD Radio transmitters with FXi 60 digital FM exciters for conversion of the station at 90.7 in Charlotte and repeater station WFHE at 90.3, in Hickory.

The station's DOE is Jobie Sprinkle. The exporter, he said, will be used to get the second audio stream and PAD data to the transmitter sites. The broadcaster will use XPi 10s to multiplex programming content into a single transport from the studio and over STL to the transmitter site.

The station also plans to upgrade its AudioVault system for compatibility with ContentDepot, BE said. ...

Separately, BE said Emmis Communications station **WIBC(AM)** in Indianapolis went on the air with an HD Radio signal generator, bringing to nine the number of Indianapolis stations broadcasting

See WHO'S BUYING, page 31 ▶



Recording engineers Jeff Hinton and Fernando Ascani of hsr/ny used Neumann and Sennheiser mics to record a voiceover with former President Clinton.

Zinnia Tower Project Nears Completion in Tucson

It has taken seven years, but the Zinnia tower project in Tucson will be done soon.

Journal Broadcast Group VP of Radio Engineering Andy Laird told Radio World that the crews would be "stacking steel" for KZPT(FM)'s new, taller tower in mid-January, 10 feet north of its old one, and the project should be done in March.

The station airs at 104.1 MHz. It is building a guyed **Pirod** tower with a special pole from **Jampro**, to accommodate its existing Jampro two-bay, half-wave antenna. The structure will also serve as an STL distribution point for Journal's other stations in the market.

The 3 kW Class A KZPT is in the northwest part of the city, between mountain ranges. It wants to increase its height above average terrain to 100 meters; the new tower will be 729 feet to accomplish that, about 220 feet taller than it was. "The impact on its signal is huge," Laird told Radio World.

The project is notable for several reasons, he said: the years it took to solve zoning, FAA and other permit matters; the easements for guy line sets required after the surrounding land had been sold; the fact that the local power company built power lines *under* two sets of the old tower's guy lines (the station ultimately paid to have them buried); and the decision by a local school district to place a building 50 feet from the existing tower.

"We had to move the school, too," Laird said.

The mounting pole is designed to allow coax to run through it and be pulled via pulley from the top, without disturbing tenant antennas.

The general contractor for the project is Warmus and Associates. The station chief is Allen Sherrill.

Who's Buying

▶ Continued from page 30

in HD Radio. All are using BE equipment.

WIBC(AM) went HD Radio in December. FM stations WENS, WNOU and WYXB were on the docket to convert by April. A BE Radio Data Dimensions System will be used to schedule, store and manage song title, artist and other text services for display on HD radios. Dave Hood is chief engineer for FM for Emmis Indianapolis. ...

KUVO(FM) used **Sennheiser** MKH800s for its 5.1 microphone setup in its feed to NPR's "Toast of the Nation" broadcast on New Year's Eve.

"The rear channels are going through a **Neumann** KU100 'Fritz' stereo head because it's simple and effective," the station's Mike Pappas said. A Neumann M150 small-diaphragm tube mic was to be used to capture the LFE channel information. He said the station uses this mic rather than artificially deriving low-frequency information from the five main channels through processing for the surround format's dedicated ".1" sub-bass channel. ...

hsr/ny recording engineers Fernando Ascani and Jeff Hinton used **Neumann** U87 and **Sennheiser** MD421 microphones to record a voiceover with former President Bill Clinton. The project, part of a film to be shown at the Clinton Presidential Center in Arkansas, was done at Clinton's desk at his home in Westchester County, N.Y. They were hired by Mozark Productions. ...

PocketREC said **Radio Free Europe/Radio Liberty** would deploy its portable digital audio products, starting at Radio Free Afghanistan. They will be used for newsgathering.

RFE/RL will integrate PocketREC Server Applications, including the Rich Media Router, which integrates into the RFE/RL digital automation system and provides automated ingest and distribution of the uploaded content.

The PocketREC Server is optimized for wireless transfer protocols and media to include GSM/GPRS, CDMA, 3G, WLAN and satellite data connections, the supplier stated.

Josef Hallermeier of PocketREC said, "No matter where a RFE/RL journalist is on this planet when they decide to record and send an audio clip, video clip or image, it becomes available in all parts of the global RFE/RL content management system instantly." ...

dMarc Broadcasting said **Radio One** agreed to standardize its 69 broadcast stations on its SS32 and Maestro digital automation systems. John Soller is regional director of engineering for Radio One. ...

Dielectric Communications said it supplied engineering and custom manufacturing to Corus Entertainment heritage station **CKOI(FM)**. The station took steps to resume broadcasts at its licensed power of 307,000 watts from downtown Montreal. It is one of five super-power stations in Canada.

"Without the modifications provided by Dielectric, CKOI FM would have been forced to reduce power to 122,800 watts permanently or move the antenna from the top of the CIBC building to the outskirts of town, thereby losing both its tremendous range and market," the supplier stated.

The project involved a redesign of the antenna to meet NIR antenna and feedline standards. Antenna spacing and other elements were modified to reduce downward non-ionizing radiation. Dieletric said there was no evidence to show the site was causing harmful effects but that the client wanted to be proactive.

Jack Hoeppner is national director of engineering at Corus. Gord Henke, president of **D.E.M. Allen & Associates**, consulted.

Separately, Dielectric supplied a customized combined antenna system to **WNYW(TV)** and **WNBC(TV)** — Channels 5 and 4 in New York — atop the Empire State Building. The system includes main and backup antennas and a signal combining system; it became fully operational in December.

"The main antenna has been installed on the ESB's well-known spire and the backup antenna has been installed on the building's 'mooring mast,'" the supplier said, referring to the structure that designers once thought could be used for debarking passengers from airships.

Radio Prague in the Czech Republic installed its second Studer Vista 7 digital mixing console.

FIRST PERSON

Radio Shines in Worst Weather

by Ken R.

The snow started around 4 p.m. and my news director glanced out the window and then looked and me with that "uh oh, we're really in for it" sort of look. Everyone in radio in the upper Midwest or Northeast knows that look.

We didn't know it but we were watching the first few moments of what would later be remembered as Ohio's "Blizzard of '78."

By the next morning we had received two feet of the heavy, wet stuff, with another couple of feet promised before sundown. I managed to get my car started in the garage but couldn't make it out of the driveway. Temperature: 12 degrees. Wind chill: Don't ask.

Courtesy of the Center for Archival Collections, Bowling Green State University

A severe blizzard struck Ohio and other states in January of 1978. Several feet of snow and brutal cold and wind led to power outages; one UPI broadcast account called it the worst storm ever in Ohio and blamed it for 35 deaths there. A student at Bowling Green State University searches for his buried car.

Situation: getting worse

A quick call to the station elicited the information that one of our engineers had a snowmobile, which was promptly dispatched to pick me up 10 miles from the station. I had never been on a snowmobile in my life and it was a wild ride. We got on the expressway and passed dozens of stranded cars and trucks in the starry darkness. While I was dressed as warmly as possible, my face was raw and tears were frozen in my eyes by the time we arrived at the station at 6 a.m.

Let's see. Morning man stranded in southern Michigan. Our traffic reporter called in sick. Morning newsman stuck in his driveway 20 miles away. Our afternoon newsman, who lived within walking distance, was pressed into service; the overnight jock and I were the only other ones who could make it in.

I certainly had on-air experience behind me, but by this time was an off-air operations manager. It looked to be a long morning. As it turns out, it would be a long two days.

Our overnight jock was playing less and less music as his airtime gradually was given over to an endless list of school closings and cancellations. Then it dawned on us that most food stores would be unable to open. Only a few gas stations could operate. Power outages were being reported and a few downed phone lines only added to the confusion. Fortunately our transmitter was in good shape and our five phone lines were all working. The furnace at the station, mercifully, was operational.

The three of us held an emergency planning meeting. The overnight man agreed to stay at the station to answer phones "for a while." The afternoon newsman would fill in on the air until 10 a.m. and I would anchor, only because no one else was available.

Music out, talk in

We ended up ditching our music programming entirely and running a marathon talk and news operation for the next two days.

The overnight guy and myself each did six-hour shifts, catching sleep when we could. I have memories of eating candy bars and drinking pop out of the machines in the hall and washing my hair in the men's room sink. We took the most amazing phone calls on the air — from people needing help, people offering help, stranded kids wanting to let their parents know they were all right, the Toledo power company, the phone company and other local officials. Anyone who could get through was put on the air live, with no seven-second delay. There were no crank callers.

We ran most of our scheduled commercials but dropped from the logs those promoting movies, events that were cancelled and spots for food stores that we knew would not open for another three days. Several of our advertisers wanted to replace their taped spots with phone-ins; we let them. A local home and garden store wanted our listeners to know they had fireplace logs, rock salt, lanterns and other supplies.

When we mentioned on-air that we were running low on food, the owner of a drive-in restaurant a mile from us drove over in a Jeep and brought a care package of hamburgers, coffee and salads. We put him on the air for a minute or two to thank him because he wouldn't take any money. Food never tasted better.

A sense of community

I was amazed at how everyone in the area seemed to pull together.

Anyone who had extra blankets made them available. Milk was shared among neighbors. We hooked up people who owned four-wheel drive vehicles with others who needed to make emergency runs to the hospital. At one point a woman called to thank us because one of our listeners brought her some supplies. I have no idea why, but I managed to keep cassette airchecks running for several hours of this insanity. These samples are verbatim:

"I'm wondering if you can send someone to 335 Luckey Road. My grandma lives there and she needs oxygen. Maybe someone can take her to the St. Charles (hospital)."

"This is Lawrence George, the Oregon City fire and police dispatcher. We're being deluged with non-emergency calls about road conditions and people wanting to know what stores are open. We don't for the most part have this information and these calls are keeping emergency calls from coming through."

"We live out here on Route 25 north of Bowling Green and we've been without electricity for over 50 hours and there are 10-12-foot snowdrifts across the road outside my window. We don't have any heat so we closed off everything in the house that we could. We have been having a hard time getting through to Toledo Edison on the phone."

"This is Dan Braceway out at the Gio Company. Lots of things are happening... we could use some donated gas. We're trying to get some church busses or Boy Scout busses...anything that could make it on cleared streets...to get to some hospitals to get some doctors and nurses taken home. If people will call me with gas or busses or four-wheel drives, we can utilize them. Give me a call and we'll dispatch you. Things have been going great and, to be honest with you, I think we saved some lives today."

Calm after the storm

Eventually others were able to make it to the station to pitch in. It was a rather festive atmosphere, considering the seriousness of the conditions.

In those days our announcers were accustomed to wearing ties while on the air; those gleefully were dispensed with. Our format clocks sat unheeded. Newscasts occurred spontaneously. No one shaved, and hygiene was perhaps not what it would have normally been.

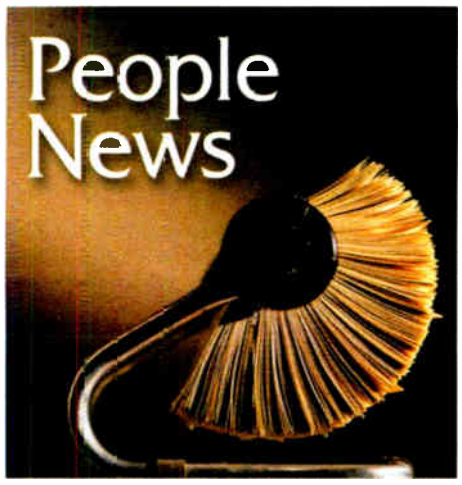
We shared food in the studio, another station no-no under normal conditions. Staffers who were a part of our makeshift programming didn't ask about overtime pay. We were all a bit giddy from lack of sleep and long shifts.

Eventually, city crews were able to clear the main roads, although it would be another four days before they reached all of the neighborhoods. Stores reopened and most services were restored. When we began to play a little music again it was almost a letdown. Someone gave me a ride home; I took my first shower in several days and fell blissfully asleep.

Things gradually returned to normal and, oddly, became less fun. But I knew that radio was meant for moments like I had just experienced. Playing the tapes of those days brought back a lot of emotional memories for me.

The postscript to all this is that in my early radio days I actually expected management to acknowledge our selfless contribution with a bonus, a vacation or at least a "thank you." Silly me.

Ken R. is a former broadcaster who now devotes his days to writing instead of talking.



Tell us about your job change or new hire. We're particularly interested in hearing news about radio engineers and managers. Send news and photos via e-mail to radioworld@imaspub.com or mail to Radio World People News, P.O. Box 1214, Falls Church, VA 22041

McCarthy Radio Enterprises Principal and President **Michael G. McCarthy** was hired by **Newsweb Corp.** to the position of director of engineering, radio group. He oversees technical operations of Chicago Newsweb radio stations.


John Buffaloe

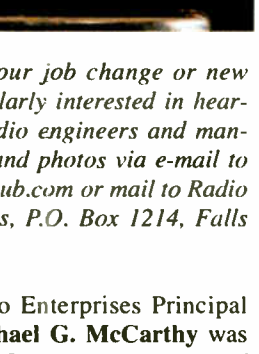
John Buffaloe, engineering manager for Jefferson-Pilot in San Diego, left the company for New Orleans, where he will be director of engineering for **Clear Channel's** New Orleans radio cluster.

Gary L. McArthur was named VP, finance and treasurer of for **Harris Corp.** He had been VP, corporate development for the company, and succeeds David S. Wasserman, who is retiring from Harris at the end of February after 17 years.

Karl Schoning

German-based Klotz Digital promoted **Karl Schoning** to president of its renamed U.S. subsidiary **Klotz Digital Audio Systems**. He had been director of engineering for the company.

OMT Technologies in Winnipeg, Canada promoted **Rick Landry** to the position of tech support manager. He joined the company in 2004 as a technical support technician.


Clyde W. Moore

Clyde W. Moore retired as president and CEO of IREC. He held various positions within IREC and Crown Broadcast since 1951.

New York sports station WFAN(AM) named **Eric Spitz** program director. He had been VP of operations and programming for **Westwood One's** Metro/Shadow Traffic Networks, after serving as assistant program director for WFAN from 1992 to 2002.

Tony Jarvis was appointed senior VP, research for **Infinity Broadcasting**. He joined the company from MediaCom, where he was senior VP, Director Strategic Insights Group since 2000. ... Infinity named **Keith Cornwell** VP and general manager of its music stations in Charlotte, N.C., WNKS(FM) and WKQC(FM). He continues to serve as the director of sales for the seven Charlotte Infinity radio stations.

Cox Radio promoted **Chris Osgood** to general sales manager of News/Talk 750 WSB(AM) in Atlanta. He had been local sales manager for WSB. ... Cox Radio Interactive promoted **Craig Hahn** to VP, sales development. He had been director of sales development.

Sirius Satellite Radio promoted **Steve Cohen** to VP, sports programming. He joined Sirius in 2004 as director of NFL programming, and was instrumental in the development and launch of Sirius NFL Radio.

Maiko Kimura was named marketing coordinator for **Harman Pro North America**. Prior to joining the company, she was an affiliate manager for DTI Services in Los Angeles. ... **Sushil S. John** was appointed to the position of country head-India for the **Harman Pro Group**. He most recently served with EVI Audio India Pvt., where he had been the director of operations and was responsible for building the company's network of channel patterns in India.


Maiko Kimura

ABC Radio Networks promoted **James M. Robinson** to president. He most recently served as general manager of the company's WRQX(FM) and WJZW(FM) in Washington.


James M. Robinson

Greater Media Inc. CEO **Peter Smyth** was elected vice chairman of the Radio Advertising Bureau Board of Directors. He has served on the RAB Board for the last five years.

See PEOPLE, page 34 ▶

People

▶ Continued from page 33

Larry Julius was promoted to market manager for **Clear Channel Radio**'s Bangor, Maine radio cluster. He joined the company three years ago as director of sales in Maine. ... **Curt Peterson** was appointed director of sales for the company's St. Louis radio cluster. He most recently served as director of sales for Cumulus Broadcasting's radio cluster in Nashville.

Also at Clear channel, **Kelly Slater** was appointed market manager for the company's radio stations in the Augusta and Rockland, Maine markets. She had been general sales manager of Clear Channel Radio's Bangor, Maine properties. ... Clear Channel Radio promoted programming executive **Alan Sledge** to VP, Clear Channel Country. Sledge served for four years as regional vice president, Southwest and director of programming operations for Clear Channel Radio's Phoenix cluster. He continues in these roles.

Don Parker, **NextMedia Group**'s vice president of programming, announced he will be leaving the company to pursue personal projects and specialized consulting. He plans to remain with the company until a replacement is found.

FCC General Counsel **John Rogovin** and **Barbara J. Douglas**, director of the Office of Workplace Diversity, left the commission. Rogovin served as general counsel since 2003, and left to become partner at Wilmer, Cutler, Pickering, Hale and Dorr. Douglas held her position since 2002, and is "pursuing a long-term goal of creating mentoring and networking opportunities for women of color in the legal profession," said FCC Chairman Michael Powell.

Maxie C. Jackson III joined **WETA** as program director. He comes to the company after six years as acting general manager for public radio station WEAA(FM) at Morgan State University in Baltimore.

Excelsior Radio Networks named **Liz Laud** as executive vice president of affiliate sales and marketing. She had previously been senior director of affiliate sales at Jones Radio Network, overseeing BDS and RadioVoodoo, and vice president of affiliate sales and programming at Westwood One Radio Networks.

Former Infinity Broadcasting President **Dan Mason** joined **First Broadcasting** as a senior advisor.

Eric Chavez was appointed to general manager and general sales manager of **Entravision Communications**' television and radio properties serving the Yuma-El Centro, Calif. market. He had been in sales at the company's Univision KPMR(TV) and Telefutura KTSB(LP), serving the Santa Barbara, Calif. market.

New Radio Group promoted **Chris Lippert** to general manager for its Ottawa stations, WCMY(AM) and WRKX(FM). He has been with the stations since 1996, and most recently held the position of sales manager.

'Engineers Week' Aims to Promote Technical Education

Feb. 20-26 is National Engineers Week.

The organizers include engineering, education and cultural societies, corporations and government agencies. The event was founded in the United States in 1951 by the National Society of Professional Engineers.

ENGINEERS WEEK®
FEBRUARY 20-26, 2005

The week is "dedicated to raising public awareness of engineers' positive contributions to quality of life." The organizers hope to promote recognition of the importance of a technical education and a high level of math, science and technology literacy, and encourage young people to pursue engineering careers "in order to provide a diverse and vigorous engineering workforce."

Information: *www.eweek.org*.

CBI Tests Blog Technology, Launches Two

A college broadcasters' organization has completed early testing of blogs.

Blog, a buzzword amongst the Web savvy, comes from the combination of the words "Web" and "log" and refers to an online journal.

The first College Broadcasters Inc. blog is a general one concerning radio, TV and Internet media. As it enters the second test phase of launching the blog, CBI is exploring RSS feeds, which enable content sharing.

Those interested in contributing are invited to post comments or send a request to participate to CBI Chair Will Robedee at *chair@collegebroadcasters.org*. The general blog can be viewed at *www.collegebroadcasters.org/currents.shtml*.

Further along is an FCC blog, developed by CBI member Michael Black. It looks at daily FCC applications and actions, focusing on those pertinent to student stations. It's at *www.collegebroadcasters.org/fccday.shtml*.

CBI says it hopes eventually to use the technology to roll out other enhancements to its Web pages.

USER REPORT

Stations Tackle Season With Comrex

Georgia Broadcasters Use Matrix With GSM Module for Live Coverage of High School Football

by Sandy Griffin, CBRE
Chief Engineer
Jacobs Media

GAINESVILLE, Ga. The Jacobs Media broadcast group lies 50 miles northeast of Atlanta, and consists of three radio stations: WDUN(AM), WGGA(AM) and WMJE(FM).

As the local high school football season approached, we determined that a new method of broadcasting sports was needed. All we had at the time were the tried-and-true RPU units. These have worked well for us over the years, but do have limitations because of our terrain.

Prior to this year we also had been using a Celljack, which worked okay with an analog bag phone. As you can imagine, though, the technicians at Cingular would frown anytime I brought a bag phone in, as GSM is its preferred transmission method.

Play ball

Last but not least was the problem of being able to hear a directional AM at night, which can sometimes be a challenge. Thus the call went out to **Comrex** and others for a solution to our problem.

The solution turned out to be the Comrex Matrix with the GSM module. We purchased ours with the ISDN module as well. Both modules can be changed easily at the base of the unit. The unit also comes standard with POTS ability. Another feature that came with the GSM module was the DC adapter. This turned out to be a nice add-on, allowing us to do more remotes easily.

At the same time, we purchased the studio unit, which also had the ISDN and with a firmware revision was able to receive GSM. Additionally, one of the nice things about the studio unit was that it would still talk to our older Comrex HotLine units.

As the season began and use of the Matrix increased, our talent became more impressed with its ease in use. I was able to write out only one page of instructions, which simply stated that they follow the on-screen instructions on the Matrix. With these in hand, even our less-experienced talent were able to set up with relative ease.

For football we used two sports headsets and a wireless mic. Some jocks also would add in a crowd mic for effect. Unfortunately, we did have to add several extra pieces of equipment, as the Matrix only comes with two XLR inputs. One can be switched from line to mic. So we had to carry an extra mic mixer. And the remote unit only has one headphone output, which also required an extra headphone mixer.

The Comrex Matrix with GSM module rests at lower left on the bumper of WDUN(AM)'s remote broadcast truck.

At the studio, the rack-mount Matrix had to receive both POTS and GSM signals from the field. The only difficulty with doing so is the unit cannot auto-switch between the two formats. Comrex devised a relatively easy alternative that allows you to send a momentary contact closure from the portable unit in the field to the rack-mount back in the studio. The closures plug directly into the rear of the unit. This problem was pretty easy to get around because I would already have decided before the game if it would be GSM or telephone.

Overall the Matrix worked great. The jocks enjoy the compact portability, and management enjoys that an extra cell phone account is not needed. Simply call your GSM supplier and ask them to attach unlimited Internet onto your current GSM phone account. Remove the SIM card from the phone and place into the Matrix.

The few improvements I would suggest to Comrex would be at least one more headphone jack on the portable. On the rack-mount unit, add a factory-installed switch to go from GSM to POTS. Also a headphone jack on the rear would be nice for troubleshooting.

For more information, including pricing, contact Comrex in Massachusetts at (800) 237-1776 or at www.comrex.com.

For football we used two sports headsets and a wireless mic. Some jocks also would add in a crowd mic for effect.

Chapter Two

One balmy Cleveland evening, the Telos and Omnia gang were relaxing when someone asked a blue-sky question: "What do you think the radio station of the future will be like?"

The ideas flew. "Computers will send digital audio right to the mixing bus," said one engineer. "Information, too." "No more sound cards, distribution amps or cable bundles," said another. "No more expensive routing switchers, either. Everything will be simply networked," said a third, "and all the audio devices will talk to each other using low-cost stuff from the computer world." "They'll probably be broadcasting in surround sound by then," piped one. "Consoles will be fully integrated with phone and codec gear, and will be much more flexible!" offered another.

Waitjustaminutehere!" came a voice from the corner. "We could do all of that today! We could use Ethernet, and it would be quick to set up and easy to use. You could network dozens of studios, or whole buildings with it. And it would cost a lot less than any other all-digital system. I'll bet broadcasters would love it!"

The engineers got very excited and decided to turn their ideas into reality. Tirelessly, they toiled. Immense quantities of pizza, Chee-tos and magical elixirs were consumed. Finally, they were ready... but how would the world react?

Good news! The system they brought to NAB was a success! Broadcasters swooned. The press were impressed. Early adopters adopted it.

Meet Axia, the newest division of Telos. Axia is all about making radio studios better.

Another happy ending! Or is it just the beginning?

Stay tuned for more...

AXIA
AxiaAudio.com

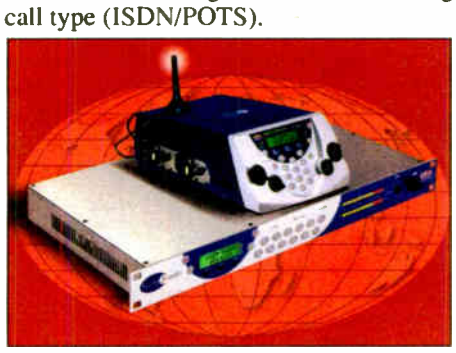
Telos
AUDIO | NETWORKS
TelosSystems.com

Omnia
OmniaAudio.com

TECH UPDATES

ATA Scoop E-Z Offers Two-Channel Mixer

ATA Audio's Scoop E-Z can be used with POTS, ISDN, wireless and Inmarsat connections. It includes a two-channel audio mixer with phantom power, a selectable compressor/limiter and auto-answer and configuration of incoming call type (ISDN/POTS).



The unit weighs less than 4 pounds and is now available for use with GSM networks by inserting a SIM card into the unit. The Scoop Studio is a 1RU version of the Scoop E-Z without battery backup and mixer functions.

For more information, including pricing, contact ATA Audio in New Jersey at (973) 659-0555 or visit www.ataaudio.com.

Nagra Ares-PII+ Has One-Touch Recording

The Nagra Ares-PII+ handheld audio recorder/player provides radio journalists with fingertip control of functions, offering solid-state recording of linear PCM mono or stereo audio onto PCMCIA memory cards, a USB interface and phantom power.

Additionally, it features an integrated loudspeaker and, as options, internal editor and MPEG compression for extended recording.

The Ares-PII+ allows one-button recording. Highlights include automatic level control; a vortex filter; a remote start/stop function; automatic voice-activated recording; lockable menus and keyboard; and menu templates.

It delivers sampling at 16-48 kHz and bitrates of 64-384 kbps, with a maximum recording time of 132 minutes on a 256 MB card in stereo at 48 kHz, 256 kbps.

There is a large backlit display. Power comes from five standard LR6 batteries or from rechargeable cells, offering more than 10 hours operation.

Mic/line input is via a 12-pin DIN connector. The recorder will work with the company's mono or stereo electret microphones or with standard dynamic microphones. Phantom 48-volt powering enables the use of commercially available condenser microphones.

The FAT 16/32 file system allows users to remove individual takes at any time and add markers to recordings during both record and playback.

The Nagra Ares-PII+ will take ATA PCMCIA cards, Strata Flash cards, Compact Flash cards and also Microdrives; the latter require card adapters.

For more information, contact Nagra USA in Tennessee at (615) 726-5191 or visit www.nagraaudio.com.

Marantz Releases Hand-Held PMD660

D&M Professional debuted the Marantz PMD660 portable solid-state field recorder. The company says the unit uses CompactFlash media cards to record digital audio. Uncompressed WAV files can be recorded at 44.1 or 48 kHz, and MP3 files can be recorded in mono at 64 kbps, or in stereo at 128 kbps. A standard 1 GB CF card can hold more than an hour of uncompressed stereo audio, more than 17 hours of stereo MP3 and nearly 36 hours of monaural MP3.

The PMD660 operates for up to four hours on four AA batteries. Audio features include two stereo condenser mics, two XLR microphone connections with 48-volt phantom power and stereo line I/O. The company says the unit's lack of moving parts makes it more reliable than cassette, DAT or other tape or disc formats.

Included in the firmware are two editing modes. Copy Segment editing uses cut-and-paste-style editing to create a new sound file, which can be up/downloaded via the USB port. Virtual Track editing mode allows the user to create an internal edit list enabling non-linear playback of file segments, without using card memory to create a new file. Ninety-nine virtual tracks can be created to compare edits, set up multiple sound bytes or to provide interview segments of differing durations.

The optional RC600 wired remote control provides Record/Pause control, track marking and peak metering from the microphone position.

For more information, including pricing, contact D&M Professional in Illinois at (866) 405-2154 or visit www.d-mpro.com.

Products & Services

SHOWCASE

TECH UPDATES

Edirol Portable R-4 Offers Simultaneous Four-Channel Recording

Edirol's R-4 four-channel portable WAV recorder and editor enables the user to record up to four channels at once, and features a 40 GB hard disk drive for extended recording. Additionally, waveforms can be edited on the recorder.

R-4 can record up to 17 hours of stereo audio at maximum sound quality (24-bit/96 kHz), or up to 58 hours at CD quality. The user can choose 16-bit or 24-bit quantization and a sampling rate of 44.1 kHz, 48 kHz or 96 kHz. Data is saved as WAV files.

The four XLR/phone combination jacks come with switchable phantom power and give the user a choice of mono, stereo, stereo X2 or four-channel recording. Digital input/output also is provided through coaxial S/PDIF. The company describes the four-channel recording by saying it enables the use of mics to capture the ambience of a performance hall, while using line input to record the performance itself.

The R-4's limiter is built into the analog stage, and helps deliver a recording touted as free of clipped noise and sudden input surges. The omnidirectional, back electret condenser mics offer transient characteristics and vibration resistance.

When the Record button is pressed, the current material is appended to a buffer that contains recorded material from a few seconds earlier. The company says this helps prevent missed recording opportunities or sound bytes at the beginning of a recording.

Effects include three-band parametric EQ, which allows sharp equalizing with high/low shelving and mid-peaking; six-point frequency band equalizing, which is suitable for recording; a noise gate, which minimizes noise during silences and cuts low-frequency noise; an enhancer that defines sound and is suitable for dialogue; and a compressor/de-esser that cuts hissing and makes the sound level uniform.

For more information, including pricing, contact Edirol in Washington state at (360) 594-4273 or visit www.edirol.com.

Tieline Says GSM Module Enables In-Field Reporting

Tieline released a GSM module for the Commander and i-Mix G3 codecs, which takes advantage of the GSM Circuit Switched Data protocol enabling up to 7.5 kHz audio to be transferred over standard GSM networks in the United States, and up to 15 kHz audio over High-Speed Circuit Switched Networks in Europe, Asia and Canada.

The company's GSM-enabled codec provides an auxiliary data stream over GSM that allows studio engineers to control the audio input levels of remote talent. Remote channel on/off button control also can be activated, which allows the studio to have control of the remote talent's microphone over a wireless link with no distance limitations.

A mounted Nokia GSM module chipset is offered in the module that can be slotted into the side of the Commander or i-Mix G3. The user can dial from the GSM-enabled codec to a standard POTS landline-enabled Tieline codec to establish the high-bandwidth link. Mono GSM capability has been added to the G3 codec's 15 kHz stereo-over-POTS and 20 kHz stereo-over-ISDN capabilities.

The company points to RTL Brussels as an example of the GSM module's use for newsgathering. A reporter packs a Tieline codec with a battery and GSM mobile into a backpack and heads into afternoon traffic with a police scanner looking for traffic stoppers such as breakdowns, accidents or construction.

Upon arrival at the scene, the reporter activates the battery pack housed in the backpack that powers the codec and dials the studio using the Vodaphone HSCSD 15 kHz GSM network service to a Tieline POTS codec in the studio. The reporter then delivers a live report of the traffic conditions, including interviews with police or drivers.

For more information, including pricing, contact Tieline in Indiana at (317) 845-8000 or visit www.tieline.com.

TECH UPDATES

HHB Offers MDP500 MiniDisc Recorder for ENG

HHB says its Portadisc MDP500 portable MiniDisc recorder is for ENG use in field-recording applications. The unit features a steel chassis with transport keys and function buttons protected by a rubber molding. The case houses an MD drive, and the company says there is a range of powering options. The large illuminated LCD display has a wide viewing angle and the menu system offers five user set-ups.

Features include balanced XLR mic inputs with switchable 48 V phantom power, limiters and bass roll-off, analog line outputs, coaxial and optical digital I/Os and parallel remote control. A USB interface enables transfer of audio to and from Windows-based PC systems.

The Portadisc MDP500 uses the ATRAC 4.5 recording algorithm and features a 40-second memory buffer and a pre-record buffer, which records six seconds of audio before the user presses the record switch. A sample rate converter makes recording from digital sources possible.

Nineteen-segment metering is provided with a switchable peak hold, as well as a margin indicator accurate in 1 dB steps to -60dB. In addition to headphone monitoring, an internal speaker enables non-critical monitoring while, in the event of microphone or cable failure, a mic provides back up.

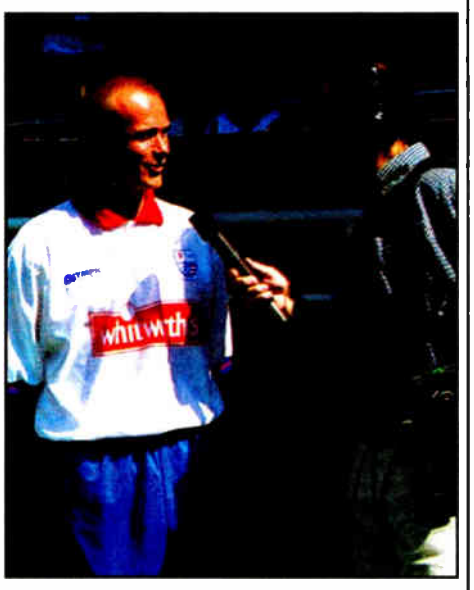
On-board editing allows the user to go to a particular point in a track, combine two tracks into one or divide one track into two, move and erase tracks and number tracks manually or automatically.

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

Courier Adds USB Connection For ISDN-Based Downloads

Sonifex says its Courier newsgathering and in-field recorder is lightweight, comes with a carry-on bag and accessory pouch and is suitable for radio broadcasting and journalism. The unit has controls on the front and top panels, with the most frequently used controls on the front.

The company says Courier features large keys with "feel-in-the-dark" operation and accidental switch-off prevention. A confidence monitor confirms a safe recording, and a backlit LCD display gives information on recording levels, battery and disc time remaining. Also included are dual mic/line inputs that can be set as balanced or unbalanced, record input gain controls, a high-pass filter and a limiter.



Sonifex Sales Manager Eamonn Heffernan, right, uses the Courier to interview a player at the Rushden and Diamonds Football Club in the United Kingdom.

Using Flash cards or PCMCIA media, the Courier records standard broadcast WAV format files, either linearly or MPEG Layer 2 compressed. "Record Styles" and parameters such as sample rate, file format and compression used can be defined so reports are compatible with the majority of editing and broadcast playout systems. Once the Record Style is selected and recording finished, the Flash cards used by the system can be plugged in to the PC for editing and direct playout.

Editing can be carried out on the Courier using the scrub-wheel and graphical display to add sections from multiple recordings to create new cuts. Both non-destructive and destructive editing are supported.

Courier uses rechargeable camcorder batteries, which provide up to four hours of record time. An audible bleep reminds the user to change the battery source. An internal rechargeable battery will give over one minute of hot-swap time, during which the main battery can be changed. The company says field reporters will appreciate the cigar-lighter adapter for emergencies and breaking stories.

A USB connection has been added to the unit for downloads to the PC. The USB port works in addition to the RS-232 serial port and the optional ISDN connection. The USB B connector supports USB 1.1, which enables downloads of ISDN-based recordings at 64 kbps to the PC more efficiently than real-time speed. The USB connection allows the Flash card used for recording to be permanently stored in the Courier without the need for removal.

Software is supplied to enable a connection with Windows Explorer in MS Windows 98/2000/XP. Once the Courier is connected via USB, the Courier hard disk looks like another hard disk on the connected PC system, from which audio files can be transferred, copied and deleted.

To file reports from a remote location, Courier can be connected to a modem or to a mobile phone where data is sent down the phone line. Live reports are carried out with the optional ISDN version or with the CO-TBU telephone balance unit. Sonifex says ISDN is the most-used option on Courier, with the BBC and All India Radio using the machines as portable codecs and recorders, making calls back to a codec, or another Courier, back in the studio.

For more information, including pricing, contact Independent Audio in Maine at (207) 773-2424 or visit www.independentaudio.com.

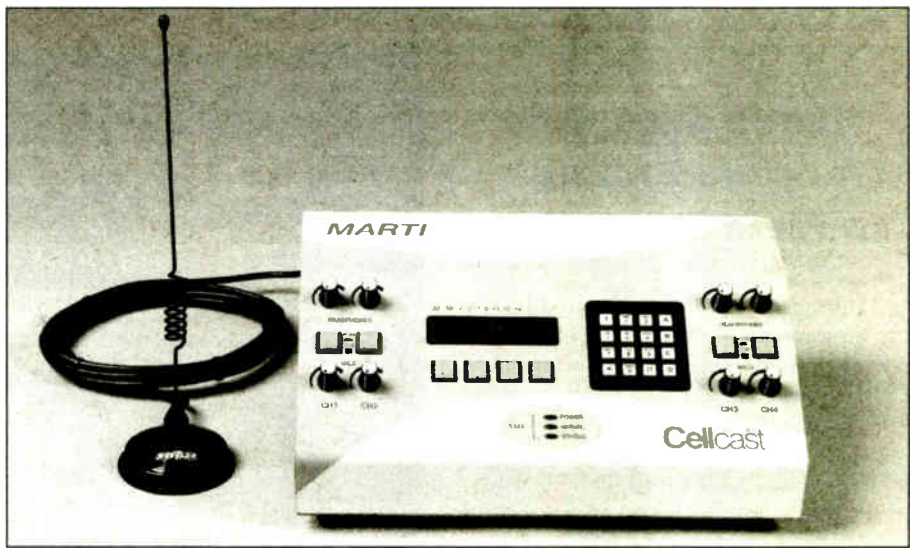
Marti's Digital Cellcast Operates on GSM Networks

Marti Electronics says its Digital Cellcast combination digital mixer and cellular remote unit is now more useful to news gatherers, with its upgrade for use on GSM mobile phone networks.

Digital Cellcast is a lightweight unit weighing approximately five pounds; it can be carried in the field and set up for remote newsgathering. It operates on TDMA and now GSM networks used by mobile phone carriers AT&T, T-Mobile and Cingular, as well as several regional and local carriers. The company says broadcasters use Cellcast to report on sporting events or to gather news in locations that do not have direct line of sight to the studio for an RF link, or in areas without landline access.

The remote unit includes a magnetic antenna and four-channel mixer. Its four microphones and four headphones are individually controlled for interviewing several sources in the field. It has line in/line out and switchable cue or program inputs. Digital Cellcast operates on 110 or 220 VAC, and comes with a separate battery pack and a 12 V DC adapter for use in remote locations without electrical service.

For more information, including pricing, contact Marti Electronics in Illinois at (217) 224-9600 or visit www.martielectronics.com.



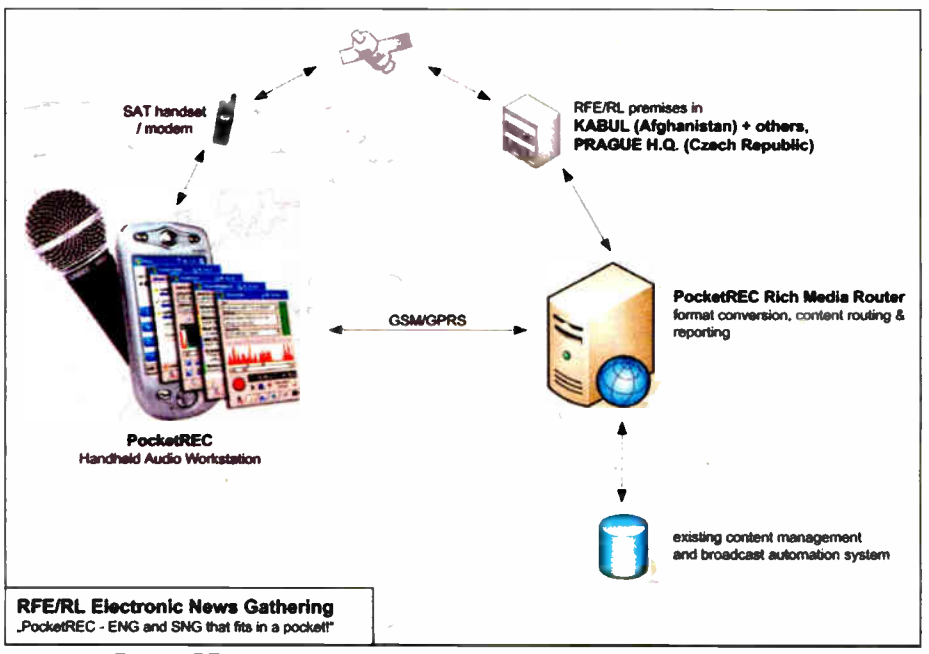
PocketREC Has Managing, Transmission Functions

PocketREC says its PocketREC portable digital audio workstation is suitable for news journalists, and enables broadcasters to merge newsgathering components such as a MiniDisc recorder, notebook, camera and mobile phone into a standard Pocket PC lightweight phone device. News stories are recorded up to 16-bit 48 kHz uncompressed, selectable.

Features of the workstation include PocketREC, for creating content; PocketManager, for managing content including metadata, storyboards, audio and images, and attaching it to the story; PocketCut for audio editing; and PocketTrans for sending broadcast production files back to the parent organization using directly wired or wireless communication, providing optional encryption with selectable levels of encryption strength.

The company says coupling the PocketREC with its Rich Media Router creates an automated broadcast data ingest solution that enables the user to record and bring the most recent news on-air efficiently.

For more information, including pricing, contact PocketREC in Virginia at (703) 281-1073 or visit www.pocketrec.com.



PocketREC describes its system as 'engineering and satellite news gathering that fits into a pocket.' It recently announced that RFE/RL is implementing the system, as shown.

BROADCAST Equipment Exchange

"Broadcast Equipment Exchange" accepts no responsibility for the condition of the equipment listed or for the specifics of transactions made between buyers and sellers.

ACOUSTICS

Want to Sell

ANTENNAS/TOWERS /CABLES

Want to Sell

ERI 10-bay FM antenna tuned to 95.3, $2500. Bob May, KDKD, Box 448, Clinton MO 64735. 660-885-6141.

2-Bay FM antenna, $2800/BO. Carl Haynes, Dominant Comm Corp, POB 31235, Jackson MS 39286. 601-573-2445.

ERI SHP-20-AC 10-bay roto-tiller antenna tuned to 104.9 mHz. Recently removed from service for upgrade, $5000/BO. Bruce Campbell, Dove Media LLP, 630 Nora Miller Rd, Abilene TX 79602. 325-677-3900.

Want to Buy

Tower, 600-800 foot & 3-1/8" or 4" line. Carl Haynes, Dominant Comm Corp, POB 31235, Jackson MS 39286. 601-573-2445.

COMPLETE FACILITIES

CONSOLES

Want to Sell

Yamaha 16 channel mixer in good condition, $750. Bob May, KDKD, Box 448, Clinton MO 64735. 660-885-6141.

Dynamax MXD digital series broadcast audio console, new never installed, 8 mix channels, 2 analog modules, 5 digital modules, slide pots, digital metering, $4500/BO. Michael Glaser, MRG Associates, Nesconset NY. 631-236-7121.

Dynamax MXE analog series broadcast audio console. New never installed. 12 mix channels, 2 mic/10 line, slide pots, analog metering, $4500/BO. Michael Glaser, MRG Associates, Nesconset NY. 631-236-7121.

Want to Buy

LPB Signature III. Want 8, 10 or 12 pot stereo model in good condition. Bill Barry, WAMB, 1617 Lebanon Rd, Nashville TN 37210. 615-889-1960.

LIMITERS/AUDIO PROCESSING

Want to Sell

Orban 2000 Digital Audio Processor, $2200. Bob May, KDKD, Box 448, Clinton MO 64735. 660-885-6141.

Orban 4000A, currently in use until mid-February, factory recalibrated in 1998, available March 1, 2005, $1750 +shpg. Herm Elenbaas, KURL, POB 31038, Billings MT 59107. 406-245-3121 or Bruce Faulkner at 406-861-1047.

Harris Digit exciter purchased in 2001 as back-up. Rarely used, new condition with stereo generator package, has everything like new. Optimod 8100A with 2 Texar Prisms, no cards, BO/all. Tony Bono, WLLJ, 980 N Michigan Ave Ste 1880, Chicago IL 60611. 312-925-4059 or 312-204-9900 ext 108.

Orban Optimod 9100 dual mono AM processor. Feed main & backup xmtr at the same time. $1800/BO +shpg. Andrew Skotdal, KRKO, 425-304-1381 or Andrew.skotdal@krko.com.

Want to Buy

Teletronix LA-2A's, UREI LA-3A's & LA-4's, Fairchild 660's & 670's, any Pultec EQ's & any other old tube compressor/limiters, call after 3PM CST, 972-271-7625.

CRL SMP- 950 AM stereo limiter in good condition. Bill Barry, WAMB, 1617 Lebanon Rd, Nashville TN 37210. 615-889-1960.

MICROPHONES

Want to Buy

RCA 77-DX's & 44-BX's, any other RCA ribbon mics, on-air lights, call after 3PM CST, 972-271-7625.

MISCELLANEOUS

Want to Sell

Aphex Compellor 323A mono audio processor, $400. Bill Hansen, KCNO, POB 580, Alturas CA 96101. 530-233-3570.

Tieline Patriot, 2 units, clean, never used on remotes, $1800 each. Bill Hansen, KCNO, POB 580, Alturas CA 96101. 530-233-3570.

Huge record collection, approx 500 records (LP). The oldest I've seen is 1967, all types. Come from a radio station in South Carolina, BO. Matt Fulmer, WKDY, 340 Garner Rd, Spartanburg SC 29303. 864-621-6230.

Lighthouse Digital TDM Audio Router, 32x32 analog audio TDM router with navigator control and configuration software. RPU system is expandable. Free to good home, you pay shipping. John Belch, WYEP, 2313 East Carson St, Pittsburgh PA 15203. 412-381-9131.

RECORDERS

Want to Sell

Tascam DA-30 MK II pro DAT r/p in mint condition, $500. Jay Swafford, WTVF, 173 Foxrun, Springfield TN 37172. 615-384-4121.

REMOTE & MICROWAVE

Want to Sell

Dolby/Marti 2 channel digital DSTL. $12,500 when new. $8000 or best offer. Call Jaycee Marshall, 817-219-1178.

120 Watt Vocom STL amplifier. 8.8 watts input. "N" female I/O connectors. Includes rack ears. $1500. Call John at 217-220-1195.

CDQ-Prima 120 + NTI interface, very good condition. ISDN quality for your studio or network, $2000/BO. Andrew Skotdal, KRKO, 425-304-1381 or Andrew.skotdal@krko.com.

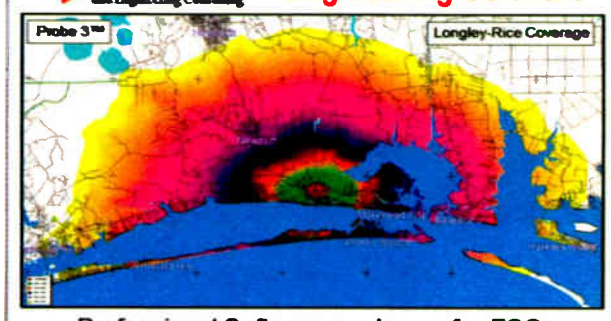
Comrex Nexus ISDN remote unit, $1250/BO in very good condition. Andrew Skotdal, KRKO, 425-304-1381 or Andrew.skotdal@krko.com.

SATELLITE EQUIPMENT

Want to Sell

MPEG-2 Satellite Receivers, LNBs, C & Ku Band Equipment. 479-997-2230; www.daveswebshop.com.

STATIONS



Want to Sell

1K days. Alabama. Cheap! $10,000 down. Joint venture. 478-741-1710 or wrecktech@yahoo.com

Want to Buy

Translators, AM's or FM's in western U.S. Contact Dougs@ihradio.org or 530-584-5700 ext 11.

TAPES/CARTS /REELS/CD's

Want to Buy

Seeking San Francisco radio recording from the 1920's – 1980's. Stations like KSFO, KTAB, KFRC, KNBR, KNBC, etc. Anything pertaining to newscast, disc jockey shows, live band remotes, etc. The format can be 16" radio transcriptions, disc, r-r tape, cassette tape, CD, etc. I'll pay to have copies made. Write or call. Ron Tamm, 140 Linden Ln #127, Mill Valley CA 94941. 415-383-6216.

TRANSMITTERS

Consultants

Consulting Communications Engineers
EMC Test Lab
- FCC Applications and Field Engineering
- Frequency Searches and Coordination
- AM-FM-CATV-ITFS-LPTV
- EMC Test Lab-FCC and European (IEC)

OWL ENGINEERING, INC.
E-mail: info@owleng.com **651-784-7445** Fax (651) 784-7541
5844 Hamline Ave. N., Shoreview, MN 55126 "Member AFCCE"

EVANS ASSOCIATES
Consulting Communications Engineers

FCC Applications • Design • Field Engineering • Tower Detuning
Upgrade & Relocation Studies • AM Directional Array Tuning & Proof

EXPERTS IN:
TV • DTV Transition • FM • Directional Antennas • RF Exposure

210 S. Main St., Thiensville, WI 53092, (262) 242-6000, FAX (262) 242-6045
http://www.evansassoc.com Member AFCCE

COMMUNICATIONS TECHNOLOGIES, INC.
RADIO FREQUENCY/BROADCAST ENGINEERING CONSULTANTS
- AM, FM, TV coverage & Upgrades
- Broadcast transmission facility design
- FCC applications preparation - construction permit and license engineering

Clarence M. Beverage • Laura M. Mizrahi
P.O. Box 1130 Tel: (856)985-0077
Marlton, NJ 08053 Fax: (856)985-8124
www.commtechrf.com

GRAHAM BROCK, INC.
BROADCAST TECHNICAL CONSULTANTS
Full Service From Allocation to Operation AM/FM/TV/AUX Services; Field Work; Antenna and Facilities Design
Over 45 years engineering and consulting experience
912-638-8028
202-393-5133
www.grahambrock.com

FASTER...
MORE ACCURATE RADIO COVERAGE
- Real Time 3-D Displays
- Interference calculations
- Cost effective mapping
- Fully integrated databases
- Used by the FCC
- Latest standards built-in

RADIOSOFT
Visit us on the web at www.radiosoft.com
101 Demorest Sq., #E, Demorest GA - 706-778-6811

Serving Broadcasters Since 1948
Mullaney Engineering, Inc.
Member AFCCE
9049 Shady Grove Court
Gaithersburg, MD 20877
(301) 921-0115
Fax (301) 590-9757
mullaney@mullengr.com

dataworld®
Market Analysis
Engineering Software
Ethnic/Demographic Data
Custom Full-color Mapping
Sales Marketing Packages

www.dataworld.com info@dataworld.com
800-368-5754 fax: 301-656-5341

R. MORGAN BURROW, P.E. & ASSOCIATES, P.C.
ALLOCATION STUDIES
FIELD WORK A SPECIALITY
ELECTROACOUSTICS
OSHA measurements
304-258-7921 • Fax 304-258-7927

Doug Vernier
Telecommunication Consultants
Broadcast Engineering Consulting
AM/FM/TV/LPTV/DTV
Custom mapping service
Frequency searches
Propagation prediction
FCC application preparation
V-Soft COMMUNICATIONS
Software for your PC
(800) 743-3684
www.v-soft.com

Structural Analysis
ERI
Electronics Research, Inc.
7777 Gardner Road
Chandler, IN 47610
(812) 925-6000
www.ERIinc.com
REGISTERED PROFESSIONAL ENGINEERS
STRUCTURAL ANALYSIS
ERI Incorporated 1943
TOWER REINFORCING

Reach Broadcast Professionals!
For more information, including rates & deadlines, fax Simone Fewell at +1-703-671-7409.
Advertise today!
Radio World

DISTRIBUTOR DIRECTORY

The following distributors serving the broadcast industry would be glad to help you with any of your requirements.

CORNELL-DUBILIER MICA CAPACITORS
FROM STOCK

JENNINGS VACUUM CAPACITORS
FROM STOCK

JENNINGS VACUUM RELAYS

SURCOM ASSOCIATES
2215 Faraday Ave., Suite A
Carlsbad, California 92008
(760) 438-4420 Fax: (760) 438-4759
e-mail: link@surcom.com web: www.surcom.com

SPACE IS AVAILABLE!

Are You a Distributor?
ADVERTISE HERE!
Space is available.
Call 703-998-7600, ext. 154.

ACTION-GRAM

EQUIPMENT LISTINGS

Radio World's Broadcast Equipment Exchange provides a FREE listing service for radio stations *only*. All other end users will be charged. This FREE service does not apply to Employment Help Wanted ads or Stations For Sale ads. These are published on a paid basis only. Send your listings to us by filling out the form below. Please be aware that it takes one month for listings to appear. The listings run for two consecutive issues and must be resubmitted in order to run again. Thank you.

Please print and include all information:

Are you currently a subscriber to Radio World?
❑ Yes ❑ No

Signature ______________ Date ______

Contact Name ______________

Title ______________

Company/Station ______________

Address ______________

City/State ______________

Zip Code ______________

Telephone ______________

Brokers, dealers, manufacturers and other organizations who are not legitimate end users can participate in the Broadcast Equipment Exchange on a **paid** basis. Line ad listings & display advertising are available on a per word or per inch basis.

WTS ❑ WTB ❑ Category: ______________
Make: ______________ Model: ______________
Brief Description: ______________

Price: ______________

WTS ❑ WTB ❑ Category: ______________
Make: ______________ Model: ______________
Brief Description: ______________

Price: ______________

***Closing for listings is every other Friday for the next month's issue. All listings are run for 2 issues unless pressed for space or otherwise notified by listee.**

Broadcast Equipment Exchange
PO BOX 1214, Falls Church, VA 22041 • Tel: 703-998-7600 • Fax: 703-998-2966

TRANSMITTERS Cont.

Want to Sell

CCA 1K AM, $8500 and CCA 10K AM, $27,000. Both just off the air in perfect condition. New tubes, manuals and spares. Delivery and installation available. 517-393-1037.

McMARTIN BF-5K, 5kW FM. Factory rebuilt in perfect, like new condition, includes new tubes, tested & tuned on your frequency. Guaranteed, fully adjustable from 0 to 5.5 kW. Goodrich Enterprises Inc, 402-493-1886.

Energy-Onix ECO. Recently taken out of service. Good backup or for parts, $1500. Bob May, KDKD. Box 448, Clinton MO 64735. 660-885-6141.

Harris MW5B, tuned to 730AM. Currently in use until mid-February 2005. PA & modulator tubes about 1 year old. See photos & descriptions at: ftbs.us/mw5b.php. Call Herm Elenbaas, KURL, POB 31038, Billings MT 59102. 406-245-3121 or Bruce Faulkner at 406-861-1047.

Marti STL model STL10 xmtrs (2) plus (2) Marti STL receivers, model R10. Asking $1600 for each pair +shpg. All was working and in excellent condition when removed from service due to upgrade in 6/04. Lannis Yeary, WXLZ, POB 1299, Lebanon VA 24266. 276-889-1073 or email: wxlz1073@mounet.com.

QEI 695T 1KW with QEI type 675 exciter, $8250 +shpg. Working & in excellent condition when removed from service due to upgrade in 6/04. Lannis Yeary, WXLZ, POB 1299, Lebanon VA 24266. 276-889-1073 or email: wxlz1073@mounet.com.

Collins 830-D, 1 KW FM xmtr with exciter, good condition, $2500. Bill Barry, WAMB, 1617 Lebanon Rd, Nashville TN 37210. 615-889-1960.

Gates 250 watt xmtr. Good working condition. Worked up until upgrade. Sandy Haga, WHHV, POB 648, Hillsville VA 24343. 276-730-0706.

Rockwell/Collins 831D-2 FM xmtr, 2.5KW, includes original 310Z-2 exciter with brand new PLL oscillator card. Frequency agile. With spare tube, manuals and proofs, $2995. Ron Kocher, WFBO-LP, 45 Pine Hill Lane, Palm Coast FL 32164. 386-437-4304.

Superior FM-100 watt solid state xmtr, no exciter, near new, $1200. Carl Haynes, Dominant Comm Corp, POB 31235, Jackson MS 39286. 601-573-2445.

TUBES & COMPONENTS

Want to Sell

4CX250BC used tube in good condition, made 100% power when last used. Was kept as a stand-by, $75. A Martin, 27518 County Road 3, Merrifield MN 56465. 218-765-4321.

4CX250BC, new, $100. A Martin, 27518 County Road 3, Merrifield MN 56465. 218-765-4321.

Classified Advertising Rates Effective January 1, 2005

	1x	6x	13x	26x
1-9 col inch (per inch)	$110	105	100	95
10-19 col inch (per inch)	$95	85	75	65
Distributor Directory	$135	130	125	120
Professional Card	$105	100	95	90
Station/Studio Services	$200	170	145	124
Classified Line Ad	$2/word			
Blind Box Ad	$15 additional			

EMPLOYMENT

HELP WANTED

Great companies are always seeking great people and great people are always seeking new and better opportunities. Time for a change? Broadcast Electronics continues to expand and seeks experienced broadcast professionals for a number of anticipated positions, including:

- RF product specialists—Analog and HD Radio transmission and STL
- Market segment specialists—Analog and HD Radio end-to-end solutions
- Post-sale customer support engineers—RF and digital studio products
- Writers—technical and commercial

BE offers stability, competitive salary, full benefits and the chance to excel. To apply, or to obtain more information about these and other jobs at BE, please fax your resume to BE at (217) 224-9607 or e-mail opportunities@bdcast.com. Confidentiality of correspondence will be protected. BE is an equal opportunity employer.

POSITIONS WANTED

Friendly, eager to work, ISCET Certified, Commercial FCC License with radar, NABER Certified two way radio technician, amateur radio extra, seeks CE, asst CE, FT, PT, Contract, AM/FM, Cable, TV. Mitchell Rakoff, mitchellrakoff@yahoo.com or 718-969-5224 or write to: 110-64 Queens Blvd PMB# 494, Forest Hills NY 11375-6347.

RW Online

ADVERTISER INDEX

This listing is provided for the convenience of our readers.
Radio World assumes no liability for inaccuracy.

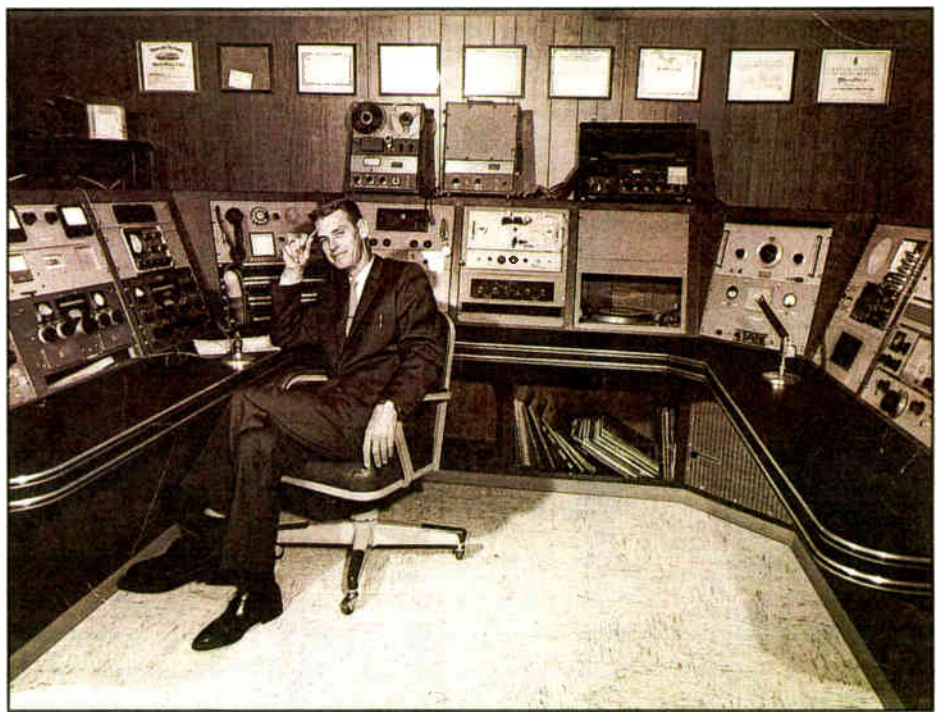
PAGE	ADVERTISER	WEB SITE URL
12	2wcom GmbH	www.2wcom.com
27	Aphex Systems	www.aphex.com
8	AudioScience	www.audioscience.com
20	Autogram Corporation	www.autogramcorp.com
16	Belar	www.belar.com
20	Broadcast Devices, Inc.	www.broadcast-devices.com
17	Broadcast Electronics	www.bdcast.com
23	Broadcast Electronics	www.bdcast.com
39	Broadcast Warehouse	www.broacastwarehouse.com
19	BSW	www.bswusa.com
4	Burk Technology	www.burk.com
20	Circuit Werkes	www.circuitwerkes.com
14	CKE/HVCA	www.rectifiers.com
7	Comrex	www.comrex.com
24-25	Comrex	www.comrex.com
1	Continental Electronics	www.contelec.com
38	Cortana	www.cortanacorporation.com
15	D&M Professional	www.d-mpro.com
3	Electronics Research Inc.	www.eriinc.com
34	Full Compass	www.fullcompass.com
38	Gorman-Redlich Mfg. Co.	www.gorman-redlich.com
29	Grace Broadcast Sales	www.gracebroadcast.com
38	Henry Engineering	www.henryeng.com
37	HHB/Sennheiser USA	www.hhbusa.com
10	Inovonics	www.inovon.com
20	LBA Technology	www.lbagroup.com
20	Mager Systems	www.magersystems.com
33	Moseley Associates	www.moseleysb.com
38	Mouser Electronics	www.mouser.com
13	Omnia, A Telos Company	www.telos-systems.com
5	Radio Systems	www.radiosystems.com
20	S.C.M.S.	www.scmsinc.com
31	Scott Studios	www.scott-studios.com
18	Sine Systems	www.sinesystems.com
35	Studio Technologies	www.studio-tech.com
9	Telos Systems	www.telos-systems.com
36	Telos Systems	www.telossystems.com
11	Tieline America	www.tieline.com
2	Wheatstone	www.wheatstone.com
47	Wheatstone	www.wheatstone.com
48	Wheatstone	www.wheatstone.com

READER'S FORUM

Image Inversion

I enjoyed Scott Fybush's article on Howard Enstrom ("Enstrom, Found in Translation," Nov. 3). But I couldn't help but notice the accompanying picture appears to be inverted left for right.

First I saw the Ampex 601 (or AG-600) with its play and rewind levers and the pinch roller on the wrong sides of the machine. Now I know Ampex had an early model with the pinch roller on the wrong side, but it was a lot larger and older than the one pictured.



Howard Enstrom, now shown right side right.

So I started squinting some more and noticed that the capital letters on the certificates on the wall appear to be on the right side of the words. You'd want to be left-handed to use that telephone panel — and spin the dial backwards, too. And Howard seems to have the peculiar habit of wearing his wristwatch on his *right* wrist.

Mike Shane
Omaha, Neb.

'No Need to Destroy' AM/FM

The current IBOC Ibiquity system does not meet FCC engineering standards for AM or FM. It causes more interference to existing service than the small benefit it might provide.

There have been successful high-definition digital broadcasting systems for years — DRM, Sirius, XM — and people who want them and have them are happy. There is no need to destroy the system of AM and FM.

Better, perhaps digital, detectors in radios could provide much of the same benefit. The reason these haven't appeared is the reluctance of most consumers to pay high prices for replacement radios with what they perceive as little benefit.

Many AM directional antenna systems can not be easily, effectively or cheaply "broadband-ed," as required for proper digital IBOC.

The Ibiquity claim that "it's all free for consumers" is a lie. Costs include destruction of and interference with the current broadcasting system, excessive expense, inconvenience and little benefit to the user.

Slow digital TV sales and adoption by consumers is a strong message. Radio is largely content-driven. Put something on the air that people want to hear, and they will listen — as long as they can pick it up on their current radios.

Clear Channel's Jeff Littlejohn's claim — that analog AM's fidelity is too good and needs to be cut in half by a brick-wall filter — reduces AM to near-telephone-quality audio. Guy Wire's statement in Radio World Engineering Extra (Oct. 27) that those who are against IBOC are stuck in the past, is untrue; most advocate even more advanced all-digital systems such as 5.1 and even 7.1 digital surround sound (not IBOC) that don't destroy AM or FM coverage, or abandon listeners, or cause inconvenience or interference.

Dolby 5.1 and 7.1 digital surround is here and could be broadcast on channels that are all-digital, not in the current band on top of AMs and FMs. Guy is right when he said 5.1 surround could be the "killer app." DRM is being adapted to 5.1 and even 7.1 all-digital surround sound; XM and Sirius are sure to follow. IBOC can hardly squeeze in two-channel stereo, and even then causes noise, interference, reduced coverage and fidelity loss.

The large broadcasting and recording trusts are terrified by their impending loss of control over what people can view and hear. They might not be able to monopolize digital delivery of all sound and video. They fear competition, restricted access by less-powerful potential competition, all while claiming to be for a free market. Unfortunately Teddy Roosevelt is no longer with us to protect our freedom and liberty.

Community broadcasting should be encouraged and provided a reasonable, inexpensive place in the AM, FM, digital and TV bands.

Richard Franklin
Super Sound Studios
WNAR(AM)

Radio World, February 16, 2005

GUEST COMMENTARY

Nine 'Bullets' About HD Radio

The Author Outlines What He Sees as Fallacies In IBOC and Offers His Support of Cam-D

by Ralph J. Carlson

This article is in response to a commentary in Radio World about the positive aspects of Ibiquity's IBOC ("Ray: AM IBOC *Does* Sound Good," Nov. 3), and Guy Wire's article in the Oct. 27 Radio World Engineering Extra, "Guy Breaks Down the Anti-HD Radio Arguments."

• HD Radio is not in-band, as it causes interference to adjacent channels with a hissing sound, thus causing reception to be degraded on those stations. The FCC should not tolerate this interference. We are required now to stay on our assigned frequency. If we stray from our band, FCC inspectors would fine us. Even a harmonic can get us in trouble. It should be no different with HD Radio.

This interference can be detected even at great distances in other cities. Of course, if all the 50 kW stations install HD Radio, it could wipe out thousands of lesser-powered stations across the United States. Canada already has voiced concerns about the interference to their stations.

• Clear Channel and Ibiquity are championing a 5 kHz bandwidth reduction. Their reasoning, though they deny it, is to give more room for HD Radio. Also, they claim that no radios are capable of wide-band above 5-6 kHz. This is incorrect, and there are radios capable of wide-band — GE Super Radios, Grundig and others. I was always under the impression that AM radio was to reach par with FM radio at 15 kHz. Additionally, the analog stations would not be able to broadcast in stereo. It will be years before IBOC even approaches 10 percent of the 800 million radios. Meanwhile, all the AM analog stations would be handicapped with inferior broadcast systems. Talk about a disaster.

• The conversion to HD Radio requires spending thousands of dollars on new equipment, etc. Even the required erection of new towers and purchasing of new transmitters will be beyond the means of thousands of stations to convert. That's not the end, though, as a license fee must be paid every year it is in use. A fee will be assessed on transmitters (HD). Estimated costs can range from $ 150,000 to $400,000 or more.

• The IBOC System cuts down skywave distance at night. There are listeners other than DXers that are tuning in to distant stations. In Salt Lake City, KSL(AM)'s 50,000-watt signal is heard all over the west. Many people listen at night. With IBOC the signal will be impaired, and what does get out will be jumbled and not listenable. On top of that, the hissing interference will affect adjacent channels 1140, 1150, 1170 and 1180.

• The digital processing delay from the microphone to your speaker can range up to eight seconds. A listener at a sporting event will see the action but the play-by-play will be delayed. However, IBOC has a plan; they will go back to analog during sporting events. This is progress?

• The IBOC signal does not work well with directional antennas. There are hundreds of directional antennas in the country that will be frustrated in this installation of HD Radio. Consulting engineers already are trying to solve this problem.

• HD Radio's signal gets interference from high-power electrical lines. Find an HD Radio station in your town and check it out.

• Coverage of the station's signal will be cut down and consequently not reach as far. Management will have to redo their coverage maps. On the fringes of coverage with HD Radio, the radio receiver will switch back to analog. It will be quite a trick to balance out volume levels while it pops back and forth between HD and analog.

• The IBOC system is proprietary, which means it is not an open-market system. The backers are the large chain broadcasters and manufacturers that will require an annual fee *forever*.

They say not to criticize another's work unless you have something better to offer. I believe that something better is the CAM-D Digital Radio Broadcasting System from Kahn Communications.

CAM-D is doing what it promised on KDYL(AM) 1060 in Salt Lake City. Tests on the spectrum analyzer show it has a clean digital signal. We are delighted to have this new digital modernization for AM Radio. Unlike the IBOC system, CAM-D will not interfere with adjacent channels. Interference from high-power electrical lines is eliminated almost completely. The signal remains strong when going through road underpasses.

CAM-D dramatically increases, and does not limit, skywave coverage. It is compatible with the more than 800 million radios in America, and more than passes NRSC standards with +/- 8 kHz bandwidth.

CAM-D will utilize the several data channels that alert the listening public about storms, road conditions and national defense. The installation cost to broadcasters is minimal compared to HD Radio, and it does not require purchasing new transmitters, tower antennas or processors. And there is no time delay from mic to speaker in your car, home or business.

CAM-D will work to improve the AM band, not take it backwards to 5 kHz. More wide-band digital radios are on the horizon that will make AM even better.

Some have posed the question why Leonard Kahn waited so long to come up with his new digital radio system. It was only when he saw what the Ibiquity system was going to do to degrade AM radio that he went to work on an alternative digital system.

Mr. Kahn is a genius — an adjunct professor of engineering at Polytechnic University of New York who holds nearly 100 patents and has worked under contract at Bell Labs and RCA Labs. All I ask is that stations look before they leap and refrain from installing something that will take the AM band backwards.

Ralph J. Carlson is president of Carlson Communications Intl. in Salt Lake City. Call him at (801) 268-8181 or Leonard Kahn at (212) 983-4765 for information.

Side Arms and Engineers

Thanks for your article on transmitter site security ("FBI Probes Tower Site Break-Ins," Nov. 17). This has always been a concern, but usually a low-level one because cases of actual break-in and damage have been rare. A recent surge in incidents, like your Houston story, brings to light the potential for problems and the need for "eternal vigilance."

I note with satisfaction that engineer Mike Pappas says, "It's sad that any of us have to worry about coming into contact with people who wish us harm." But as a practical engineer, capable of independent action and solving problems, he notes, "We were carrying side arms when we visited the tower site."

I remember that a few years ago, as we were working in the early hours at a large transmission site in a heavily populated area, local police came by to warn us that a notoriously dangerous and armed individual was on a rampage in the area. We took all possible external security measures and I added a layer of point defense by arming myself.

Working with others, I would be able to have access to the proper tool for defense and access to it in a stealthy nature — something an intruder would not expect and would not watch for, allowing a smooth transition, at the proper time, from being attacked to going on defense.

Self-defense — defense of life and property — is a basic need. Most of the time this need is out of sight and mind. But when needed, it is a "right now" incident that needs a "right now" solution, hence the side arm. It could be said that a proper engineering solution is to be prepared with the proper tools to deal with the problem.

But tools alone do not deal fully with problems. They require training, practice, familiarity, mindset and a few other human and technical factors; and that is the case to create an effective self-defense system or equip an individual. That is what was meant by "well regulated," a phrase we have heard about lately.

I cannot stress strongly enough that an individual should seek effective training, education, practice and understanding of the law, to go with the chosen tools. The tool alone will not function properly if the individual is lacking the mind-set to defend oneself.

Disastrous results ensue. They might be unintentional. But the user must understand the legal consequences.

Your warning against set-traps in the page 46 editorial of the same issue is well made. I could go into the many possible legal scenarios of a self-defense situation, but we do not have time. I am comfortable that Mike Pappas has all the bases covered. If not, take that refresher course at Front Sight, Thunder Ranch or any of the hundreds of large or small training groups.

Finally, the author says to "buddy up" when visiting potentially problem areas. Have someone you trust accompany you to watch your back or call for help.

Thanks for touching on the issue of armed self-defense. Even if it was only with one sentence, you have most likely stirred an understanding of agreement among many others.

Bob Culver
Laurel, Md.

Seeking Generator Output Solutions

We purchased propane-powered generators with automatic transfer switches for our studio and transmitter sites, along with UPS units for computers and other critical broadcast equipment, expecting that the UPSs would protect and maintain uninterrupted power during the half-minute or so between utility power failure and the generators getting online. This they do well, for short power outages.

Unfortunately, our UPS units do not accept the generator power, due to distortion of the sine-wave output of the generators, which is caused in part by the UPSs themselves, as they are non-linear loads. This means the UPSs continue to run on batteries even though the generators are powering non-UPS "protected" equipment, and will run only until their batteries run down.

The makers of the generators and UPSs have suggested loading the generators with as many "clean" (linear) loads as possible, isolation transformers or adjustable input UPSs; but we have yet to find a practical solution. We would like to hear from readers who have found a practical way to clean up generator output, so that UPSs are "happy" with it.

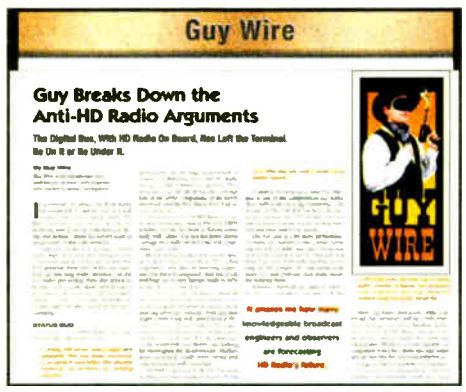
Please send suggestions via e-mail to *kneb@actcom.net*, or call (308) 632-7121.

Les Proctor
Chief Engineer
KNEB(AM/FM)
Scottsbluff, Neb.

◆READER'S FORUM◆

The Buggy Called The Whip Black

It's annoying when people like "Guy Wire" say things like "Put away your buggy whips, boys, and accept the reality of 5 kHz AM," as he did in the Oct. 27 Engineering Extra article, "Guy Breaks Down the Anti-HD Radio Arguments."


Guy Wire

Guy Breaks Down the Anti-HD Radio Arguments

The fact is that promoting 5 kHz audio is itself a reversion to circa pre-1936 performance. Now, who's selling buggy whips?

You can look it up in old radio manuals and radio engineering textbooks: Many console radios from the late 1930s included a bandwidth or fidelity switch that adjusted the receiver IF bandwidth. You could select Narrow/Sharp or Wide/Hi-Fidelity on many of these classic radios.

Granted, most network programs back then were probably not "high-fidelity," the major stations would have local programs with wide audio and many AM receivers were not that bad until perhaps the point that Stereo FM became significant force. The receiver manufactures stopped putting much effort into the AM section and concentrated on FM performance. The stereo equipment salesman's pitch was that FM sounds better, thus the radio had to sound significantly better on FM than it did on AM when demonstrated in the showroom — easy to do if the AM section of the tuner he is trying to sell you is without any treble.

I'll bet that most major AMs had wide audio (wider than 5 kHz) for local programs, DJ programs, etc. all the way through the 1940s, '50s, '60s, '70s, '80s and '90s.

Now the new HD sales pitch is the same, except that you "sell" IBOC by artificially increasing the quality contrast between it and analog reception. If all stations are limited to 5 kHz analog, you've got your sales demonstration ready to go. The only way the customer is going to hear good "AM" audio is now on the IBOC receiver.

Karl G. Wolfe
Portland, Ore.

No Personal Attacks, Please

I am concerned about all the personal attacks RW has published against Dr. Kahn. This type of journalism appears to be popular in some magazines, as seen in the following letter from the Dec. 14, 2004 issue of PC Magazine:

"Recently I have seen a lot of insults hurled toward one of your columnists, John Dvorak. It is sad that people would insult a columnist for express(ing) their views instead of discussing or debating what he actually wrote.

"It is an injustice for PC Magazine to print derogatory feedback. While it may only be reprinting what others have sent, the comments fit well in the 'bashing' category. It is not professional for a magazine to reprint such libel. Dvorak isn't perfect, but whether he's right or not, whether his views are popular or not, he is a visionary and his reputation is respected.

"If it is my goal to prove him wrong, it seems logical that I would debate him with facts, not insults. An insult used in debate invalidates the argument being offered. A professional does not resort to slander."

What is so objectionable in PC Magazine against John Dvorak is equally objectionable in RW against Dr. Kahn.

Steven Karty
Vienna, Va.

AM Bandwidth

I'm not a Radio World subscriber or a broadcast engineer, but I would like to throw in my two cents on the AM bandwidth issue.

In the November 1989 issue of the Journal of the Audio Engineering Society, Nevelle Thiele wrote a paper examining AM radio improvement. He stated that while limiting the bandwidth to 4.5 or 5 kHz would appear logical as the side bands of each transmission would be neatly contained, thus incapable of interfering with an adjacent channel, this practice is unnecessary.

The NRSC standardized on a 75 us preemphasis at a time when high-frequency boosting was common and unregulated. Most receivers were not wide-band and this is still true today. Neville's approach was to keep the NRSC's preemphasis up to about 4 kHz but allow it to fall off above 4 kHz. Narrow bandwidth receivers would benefit from the NRSC boost and wide-bandwidth receivers would work well with a Cauer filter to remove the whistle of first-adjacent interference. The "monkey chatter" caused by the most powerful part of the side bands of a first adjacent would no longer be a problem.

On the subject of HD Radio IBOC, FhG's spatial encoding which permits FM stations to transmit 5.1surround could be future insurance for free over-the-air FM radio. 5.1 is all the rage in pro audio and broadcasters should give this careful consideration.

However, I'm not so sure about HD Radio IBOC for AM. For those with new digital receivers, the audio improvement is amazing. But the 900 million or so existing analog receivers would suffer a raised noise floor during the transition to digital radio and this could hurt rather than help AM radio. The processing delay could also pose a significant problem for listeners at sporting events. Analog AM has unique propagation characteristics making it a regional service for even the most inexpensive receivers.

I still enjoy AM for news, talk and sports and I believe AM will continue to serve us well for many years to come.

Larry Ray
Springfield, Ill.

KFI's Tower Tragedy

The recent aviation accident that resulted in the destruction of the tower at KFI(AM) can only be described as a tragedy. Two lives were lost when a rented Cessna 182P hit the tower during a landing approach to the Fullerton Municipal Airport in California. The 57-year-old tower fell onto itself, with the top of the structure landing about 20 feet away from the base.

The KFI tower was a piece of broadcast history, dating to 1947. Reaching 760 feet above ground level, it was a significant local landmark, recalling an era when clear-channel AM stations were the kings of the broadcasting world. The tower was approximately one-half wavelength at KFI's operating frequency of 640 kHz and provided a signal that reached hundreds of miles. It is hard not to feel some awe at the longevity of such a tall tower, which was built just after the end of World War II when radio broadcasting was poised to explode in its reach and number of outlets.

As has happened at many historical AM sites, the once-quiet area surrounding the KFI tower had become a maze of commercial buildings and parking lots. Miraculously, only minor damage occurred to one nearby building, in spite of the complete collapse.

After the accident, we heard murmurs of a need to add further regulations restricting towers in an effort to reduce the chance of future accidents. Adding strobe lights or even re-siting towers that are too close to airports was suggested.

This is understandable, as no one wants to see such a needless loss of life repeated. But it should be remembered that this tower had been in this location for 57 years of safe coexistence with the nearby airport. It is also important to keep in mind that aircraft pilots are not simply members of the general public, ignorant of the hazards of aviation; they are highly trained in safety procedures. The KFI tower was marked clearly on aviation maps for pilot flight plans and used widely as a navigation aid.

Radio broadcasters already are under strict regulations regarding the maintenance and siting of towers near airports, including the need for special marking and lighting. These marking systems are expensive to install and require ongoing maintenance. Early reports suggested that the FAA-recommended safety requirements for station KFI were met at the time of the accident. In spite of this, and in full daylight, the tragedy occurred. The National Transportation Safety Board is investigating the accident and will report on the causes in a few months.

We are all lessened by this tragedy. But we must not overreact with needless regulation that may not, in the end, provide much additional safety.

— RW

Radio World
Vol. 29, No. 4 February 16, 2005

Telephone: (703) 998-7600 • Business Fax: (703) 998-2966 • Editorial Fax: (703) 820-3245
E-mail: radioworld@imaspub.com • Web site: www.rwonline.com

NEXT ISSUE OF RADIO WORLD MARCH 2, 2005

For address changes, send current and new address to RW a month in advance at P.O. Box 1214, Falls Church, VA 22041. Unsolicited manuscripts are welcomed for review: send to the attention of the appropriate editor.

Radio World (ISSN: 0274-8541) is published bi-weekly with additional issues in February, April, June, August, October and December by IMAS Publishing (USA), Inc., P.O. Box 1214, Falls Church, VA 22041. Phone: (703) 998-7600, Fax: (703) 998-2966. Periodicals postage rates are paid at Falls Church, VA 22046 and additional mailing offices. POSTMASTER: Send address changes to Radio World, P.O. Box 1214, Falls Church, VA 22041. REPRINTS: Reprints of all articles in this issue are available. Call or write Emmily Wilson, P.O. Box 1214, Falls Church, VA 22041; (703) 998-7600; Fax: (703) 998-2966,

The Wheatstone GENERATION-5 has the POWER and FEATURES Stations Demand the MOST

LOTS More!

Our Generation-5 provides your operators with a straightforward traditional control surface coupled with all the benefits of digital technology. It gives you the flexibility of system-wide source, mix and destination control (any signal any*where*), a powerful mix-minus section and a complete event store, name and recall system. One wire from this surface can control THOUSANDS of wires in your technical operations center.

And while the G-5 *feels* like an analog console, its DSP-based mixing engine keeps your digital sources digital while converting analog sources to switched digital, eliminating crosstalk and noise. It can furnish remote and telcom functionality on any input fader without fear of feedback—a real plus in back-to-back daily operations. Its built-in graphic displays keep operators on top of things with just a glance. And since the entire system is software based, you can accommodate any format with a press of a button.

Like all our Generation Series consoles, the G-5 has complete failsafe options available, such as automatic fail-over DSP and CPU cards and redundant power supplies. We can even provide scheduling software and studio mounted satellite cages that can be configured to mix independently from your main routing system.

At WHEATSTONE *we've built and sold over a thousand digital audio consoles.* The G-5 is a culmination of all that experience. *Benefit from our expertise — choose* ***WHEATSTONE!***

Wheatstone

600 Industrial Drive, New Bern, North Carolina 28562
252-638-7000 / www.wheatstone.com / sales@wheatstone.com

Behind Every GOOD CONSOLE There's an EVEN BETTER ROUTER

GENERATION 4

A Straightforward, Easy-to-Use Control Surface

There's no long learning curve required to immediately start using this traditional layout specifically envisioned for operators of all skill levels.

***BRIDGE TECHNOLOGY** enables the GEN-4 surface to operate far beyond the limits of its studio mainframe. Integration with the Bridge digital audio network router provides systemwide access to all station on-air and off-air audio resources via interlinked CAT-5 or fiberoptic cable. And of course, we all know **EXPERIENCE COUNTS**! With over eighty Wheatstone Generation control surfaces already operating in the field, you can be assured your installation will proceed smoothly and on time.*

the digital audio leaders

Wheatstone

www.wheatstone.com