

*****AUTO**3-DIGIT 857
S117298 D08 0610
TOM MILLER 225
ASST CHIEF ENGINEER
KTZR
2033 S AUGUSTA PL
TUCSON AZ 85710 7905

A Store-and-Replay Future?

Experts discuss consumer behavior and digital radio during an AES panel.

Page 24

Fritts, Frist And Friends

The year 2006 brought changes in Washington that will affect the radio industry.

Page 18

Radio World

\$2.50

The Newspaper for Radio Managers and Engineers

December 20, 2006



INSIDE

NEWS & HD RADIO

▼ Comments on ownership roll into the FCC.

Page 3

▼ The holidays bring special prices and more news on the receiver front.

Page 20

▼ How two stations in the nation's capital are programming their multicast channels.

Page 22

ENGINEERING

▼ A Christmas 'Goose' in Workbench.

Page 10

▼ Bob Royal's 60 years at WPTF(AM)

Page 12

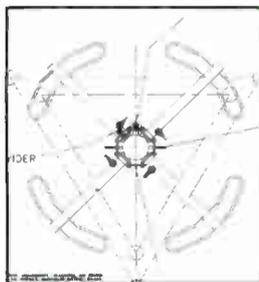


STUDIO SESSIONS

▼ Frank Beacham says the Acoustic Wave II gives good bass.

Page 26

BUYER'S GUIDE



▼ A year-end look at antennas, transmission support and other specialized gear for your RF plant.

In This Issue



Thank you for making Radio World the industry's top choice in trade publications for 30 years.

NEWS ANALYSIS

Will Sale Allow CCR To Prosper?

Analysts Pore Over The Numbers After Clear Channel Agrees To Buyout Deal

by Randy J. Stine

SAN ANTONIO With an acceptable offer on the table and the promise that senior management would remain in place, Clear Channel's board of directors accepted a buyout deal. Some analysts say this move signals renewed interest from private equity groups in the radio business.

"Clear Channel management executed a transaction that takes advantage of the gap between private and public values for media companies," said John Sanders, an analyst with Bond & Pecaro.

Analysts say the move to go private allows Clear Channel to streamline and refocus the company, which at one time had as many as 1,200 radio stations but will soon have far less.

"The Mays family replaced its public shareholder partners with private equity

See CCR, page 6 ▶

Entercom Cuts Its 'Carbon Footprint'

Broadcaster Seeks to Think Green And Save Money in the Process

by Randy J. Stine

BALA CYNWYD, Pa. Many broadcasters are trimming high electric bills by imposing system-wide energy conservation policies for studios, transmitter sites and offices to reduce electricity use. The

changes, in turn, also help the environment.

At least one broadcaster has taken extraordinary measures to reduce its so-called "carbon footprint" by adopting green policies, such as using alternative energy vehicles. See GREEN, page 8 ▶



A gas/electric hybrid Toyota Camry used by WMMM(FM) for station events.

BE A HERO THE EASY WAY -- LET US DO IT!

"CONTINENTAL ELECTRONICS IS A GREAT COMPANY AND HAS A GREAT PRODUCT IN THE 816-HD TRANSMITTER.

I'M AMAZED AT HOW SMOOTHLY THE 816-HD WAS INSTALLED AND THAT IT MADE FULL POWER - INSIDE THE MASK - WITH EASE!

TO DATE, THIS IS OUR HIGHEST-POWERED COMMON AMPLIFIER HD INSTALL AND THE ONLY ONE DOING MULTICASTING. THIS IS THE EASIEST HD INSTALLATION WE'VE DONE SO FAR."



- DAVE OBERGOENNER
DIRECTOR OF ENGINEERING,
ZIMMER/JAYHAWK BROADCASTING

Call 800.733.5011 or visit our Web site at www.contelec.com

◆ NEWS WATCH ◆

CBS Takes Jackson Fine to Federal Court

NEW YORK CBS is still fighting the FCC over the Janet Jackson breast incident in the 2004 Super Bowl half-time show. The network says the broadcast was unscripted and therefore CBS O&Os should not be fined a total of \$500,000 for indecency.

In a lawsuit filed before Thanksgiving, CBS told a federal court the FCC's "zero tolerance" policy has the potential to cut

off free speech.

In response, an FCC spokesman said, "CBS believes there should be no limits on what can be shown on television even during family viewing events like the Super Bowl; we continue to believe they are wrong."

PPM to Launch In Philly

NEW YORK In updating its 2007 rollout schedule for the Portable People Meter, Arbitron has switched the first market launch to Philadelphia, set for January.

Houston, the PPM demo market since 2005, would switch from diaries to the PPM after Arbitron obtains Media Rating Council accreditation for that market.

The Fall 2006 diary-based ratings report would be the "currency" in the market until the release of the March 2007 PPM ratings report. The January and February 2007 PPM radio ratings reports would be released as demonstration data.

Arbitron President/CEO Steve Morris said the Media Rating Council did not grant Arbitron accreditation at its Nov. 15 meeting but that the list of question areas has narrowed and the audience research firm would work with the MRC to address issues of concern.

News Roundup

RADIO SHACK dropped the price of its Accurian HD Radio to \$99.99 after a mail-in-rebate, for three days in late November. The tabletop radio normally retails for \$199 although the company is also offering a \$25 mail-in rebate for a limited time through Jan. 14, 2007.

KEVIN MARTIN was reconfirmed as FCC chairman. The Senate approved his nomination in November. Martin's first five-year term as commissioner expired June 30 and the president renominated him. NAB President/CEO David Rehr stated NAB supported Martin's renomination.

ARBITRON had planned to make non-coms eligible for reporting in local radio market surveys starting with the release of the Fall 2006 survey. But the research firm has delayed those plans; it prefers to start noncom, satellite and Internet radio reporting at the same time and said it is still figuring out how it wants to credit satellite radio entries.

SPECTRAREP and DHS-FEMA took part in emergency prep and alerting demos at an emergency managers' conference in Orlando. SpectraRep, owned by BIA Financial Network, is providing systems integration and project management for the Digital Emergency Alert System, a wireless data delivery system. It's a project of the Association of Public Television Stations and Federal Emergency Management Agency, part of the Department of Homeland Security.

THIS IS THE NEXT BIG THING:



WHEATNET™ — FUTURE PROOF!

WHEATNET LETS YOU ROUTE THOUSANDS of bi-directional signals at ONCE in just 60 microseconds—all secure, virus-proof and in just 2 rackspaces! WHEATNET leaps way ahead of conventional stacked router or IP-based designs, interconnecting up to 48 studios (each with its own independent mix engines and I/O resources) using just one CAT-5 wire per studio, plus providing systemwide X-Y control from one central location. You can even meter and monitor (in stereo) any signal systemwide.

REDUNDANCY? We've got that covered too: just add a second WHEATNET and CAT-5 link from each studio and have an AUTOMATIC standby interconnect for the ENTIRE system!

WHEATSTONE has a proven track record for digital networking; benefit from our experience!



48 CAT-5 PORTS with 128 audio channels (plus embedded control data) per port. THAT'S 6144 TRAFFIC CHANNELS IN JUST TWO RACK SPACES!



Wheatstone

GET THE POWER!

tel 252-638-7000 / sales@wheatstone.com

copyright © 2005 by Wheatstone Corporation

Index

NEWS	
Entercom Cuts Its 'Carbon Footprint'	1
Will Sale Allow CCR to Prosper?	1
NewsWatch	2
Media Ownership Filings Roll Into FCC	3
They Filled These Pages	4
Crafting New Media Ownership Rules	5
FEATURES	
Workbench: Not Such a Silly Goose	10
Bob Royal's 60 Years at WPTF(AM)	12
Turntables and Radio in the 1950s	14
TMS Takes a Different Track	16
Farewell Fritts, Frist and Friends	18
HD RADIO	
HD Radio Car Converters Revealed	20
HD Radio Scoreboard	21
WHUR, WAMU Unveil Multicast Channels	22
STUDIO SESSIONS	
A Store-and-Replay Future?	24
Acoustic Wave II Gives Good Bass	26
BUYER'S GUIDE	
DCBR Maintains Coverage, Transmits HD	29
ERI Lynx Serves Up Analog, Digital	32
Salem Uses Shively Lindenblad Antenna	33
Rolling Hills No Match for SynchroCast	34
Barix Provides Yukon With STL Link	39
OPINION	
Reader's Forum	45-46
Rethinking AM's Future	46

Media Ownership Filings Roll Into FCC

This is the third installment of comments filed to the FCC on the media ownership issue. Rules that affect radio to be reviewed by the commission are local radio ownership limits, radio-newspaper cross-ownership and the radio market definition.

We published excerpts of comments by NAB, broadcasters and others in previous issues. The following are additional new excerpts:

National Association of Black Owned Broadcasters, Washington:

The National Association of Black Owned Broadcasters Inc. and Rainbow/PUSH Coalition submit these comments as part of our ongoing effort to persuade the commission to take action, rather than merely provide lip-service, to the adoption of policies and rules that will promote ownership of broadcast facilities by minorities. ...

The commission ... should review NABOB and Rainbow/PUSH's request for reconsideration of the decision to eliminate review of market share information in radio assignment and transfer cases. The commission's decision to no longer consider market share information was one of the principal flaws in the commission's 2003 Order identified by the court.

In our Petition for Reconsideration, NABOB and Rainbow/PUSH showed that there is overwhelming evidence in the record justifying retaining the market share review procedure known as "flagging." The court's decision supports this conclusion.

The principal points raised in the Petition for Reconsideration are:

The commission should: adopt policies to promote minority ownership in this proceeding, not in a separate proceeding to be instituted at some unspecified date ... require divestiture of radio ownership clusters that exceed the local radio ownership rules and should not grandfather these clusters and retain its policy of "flagging" transactions which exceed the 50/70 threshold for market concentration. ...

If the commission does not eliminate its grandfathering policy, the commission should allow minority owned companies to own stations equal to the number of stations owned by the largest group owner in the market and allow station clusters to be sold to minority owned companies, regardless of the size of the minority owned company. ...

The commission should not count non-commercial stations in determining the number of stations in a local radio market [nor] relax its ownership rules to allow greater combinations of radio, television, and newspaper ownership.

Bonneville International Corp., Salt Lake City:

Today's media market includes more local television stations, hundreds of video channels offered by cable, DBS and IPTV providers, nearly double the number of local radio stations, the advent of satellite radio, and of course, the Internet and all its varied sources of news and information, making any cross-ownership restrictions involving newspapers truly an anachronism.

Notably, the impact of the Internet could not be more profound — the Internet of today has expanded viewpoint diversity in ways unimaginable just three

years ago (let alone in comparison with the market as it existed in 1975). For example, the terms "blog," "tagging," "RSS," "podcast" and "user-generated" did not appear in the "2002 Media Ownership Biennial Review Order."

Media has now evolved beyond point-to-multipoint distribution to an interactive medium that enables user choice and user-generated content and feedback. In today's media marketplace, newspaper/broadcast restrictions in the name of diversity cannot be justified.

Further, any restriction on newspaper/broadcast cross-ownership cannot survive constitutional review. The Supreme Court's decision upholding the newspaper rule more than 25 years ago was based on the factual premise that a scarcity of broadcast outlets existed and that newspaper owners were not treated dissimilarly than other owners of major mass communications media. These underpinnings no longer exist, and the constitutional restrictions can no longer be justified.

There is overwhelming evidence in the record justifying retaining the market share review procedure known as 'flagging.'

— NABOB and Rainbow/PUSH

In addition, the ban on newspaper/radio cross-ownership is particularly objectionable and must be eliminated. While the commission has expressed keen interest in promoting news and public affairs programming for radio stations, the rule precludes cross-ownership with newspapers — entities in prime position to deliver this type of programming.

The rule restricts local newspapers from extending their local news reporting onto the radio platform. Moreover, permitting newspaper/radio cross-ownership creates viable opportunities for minority-owned newspapers to acquire affordable broadcast properties.

Finally, Bonneville urges the commission to act quickly to eliminate any limits on newspaper/broadcast cross-ownership — even if that means acting on the newspaper rule before addressing the other media ownership limits. The newspaper rule is the only commission media ownership rule that has not been modified in any way over the course of the last 30 years, and it has now been a decade since the commission first suggested that the rule be modified in light of the media marketplace.

Nicholas Leggett, Reston, Va.: The media ownership rules could be changed to allow only one broadcast channel (radio or TV) for each broadcasting corporation in each metropolitan area. In addition, any broadcasting media organization having more than one channel in a city should be required to rent the excess channels to other media organizations at regulated rates. Thus, the larger organizations could still own excess channels while the interests of diversity were still being served.

Nicholas Leggett, Reston, Va.:

Alternatively, new technology can be employed to use a portion of the newly

available millimeter waves for local broadcasting. This technology would allow numerous local broadcasting channels to be set up in every community in the United States.

Each broadcasting station could use a "lighthouse protocol" where a rotating narrow beam is used to distribute digital program content to the memories of consumers' receivers. Each receiver would play back the program content to its user.

The electromagnetic spectrum in the millimeter wave range is so gigantic in

capacity that it can accommodate thousands of broadcast stations in a metropolitan area. With this technology, the current scarcity of broadcast channels is replaced by a plentiful supply of channels where every organization and individual who wants a channel can have one.

Spectrum auctions should not be used. Spectrum auctions strongly favor the richest and largest media communications organizations while blocking all other Americans from owning communications facilities. ...

The commission should seriously consider making the media ownership rules stricter than they currently are. Each media corporation (large or small) should only be allowed one channel (radio or television) in any metropolitan area.

In addition, provision must be made so that individuals and small neighborhood organizations can set up local broadcasting stations in their neighborhoods. These local broadcasting stations would also be subject to the one channel per owner rule.

If the conventional radio and TV broadcast media become highly consolidated, with only a few corporate views broadcast, do we want to keep conventional broadcasting at all? Or should their channels be reassigned to other services including wireless Internet services?

The best argument for retaining conventional broadcasting is its service to Americans of all economic strata and its potential for emergency information broadcasting. However, the ownership rules should be structured so that multiple media organizations have access to each city and local broadcast organizations (and individuals) have the opportunity to broadcast.

See OWNERSHIP, page 6

Get the Best Prices from all the Popular Brands!



Broadcast Depot

www.7bd.com

**YOUR #1
BROADCAST
PROVIDER**





















...and much more!

Contact Chuck Maines at Broadcast Depot to get your next quote, and see what you've been missing!
 Email: cmaines@7bd.com | www.7bd.com
 Toll-Free: 877-90-BDNOW (23669) | Fax: 765-983-3817

They Filled These Pages

Each year at holiday time, I pause to thank the many people whose writing and opinions you've read in these pages over the year. It's a big deal for me, because no other publication has this kind of involvement from such a broad range of the industry's technical and management leadership.

Last year a reader wrote me to complain (rudely) about this. I guess his sense of entitlement was challenged when I chose to use my column to say thanks to the people who help make RW happen. What a Scrooge.

I like the tradition because it demonstrates in a compact visual way the reach and influence of RW. It shows how widespread our resources are. And, simply, it allows me to thank the contributors and newsmakers who helped me do my job.

So without further yap, here are the people who wrote news stories and columns, sent letters and Workbench tips or allowed us to profile or spotlight them in 2006 in Radio World and Radio World Engineering Extra. Thanks also to the many additional folks, not named here, who were quoted, who helped behind the scenes and who supported us in other ways.

(I haven't forgotten my unnamed complainant. His name is on a lump of coal in my office.)

John Abdnour, Lee Abrams, Mike Adams, Dave Adams, Jonathan Adelstein, William Ainsworth, Randy Aldous, Cris Alexander, Amanda Alexander, Carl Amari, Maureen Anderson, John Andrews, Len Arminio, Max Armstrong, Jerry Arnold, Larry Arnold, Ben Ary, Allan Augustyn.

Don Backus, Joan Baker, Craig Baker, Bob Band, Steve Barker, Jim Barry, Mark Battersby, William Bauer, Fred Baumgartner, Linda Baun, Harold Bausemer, Frank Beacham, Gary Begin, Fred Bennett, Jeff Bennett, Jon Bennett, Larry Berger, Mike Bergman, Oliver Berliner, Bill Betlej, Dave Bialik, Harry Bingaman, John Bisset, Dennis Blais, Gary Blau, Barry Blesser, Marty Bloss, Cathy Blythe, Kris Bobo, Drew Bodker, Jeff Borden, Bill Bowin, Wes Boyd, Bill Boyer, Brian Brachel, Tim Braddock, John Bradford, Randy Bradley, Rick Brancadora, Oscar Brand, Joseph Brannan, Jim Bremer, Jackie Broo, Kelly Brooks, Bill Brooks, Warren Brown, Ed Bukont, Dave Bull, Burt Burdeen,

Read Burgan, Jerry Burling, Bob Burnham, Paul Byers, John Byrns.

Bill Cahill, Steve Callahan, Murry Camper, James Careless, Tom Carten, Alan Carter, Bruce Carter, Bob Cauthen, Lynne Chadwick, Felipe Chavez, Jack Cheese, Lynn Cheney, Nathan Chervek, Rob Chickering, Paul Christensen, Marguerite Clark, Curtis Cleland, Richard Clemons, Todd Coggins, Harry Cole, Peter Conlon, Brian Conniff, Robert Conrad, Dino Corbin, John Corbin, B.J. Crabb, Ed Craig, Jay Crawford, John Crigler, Bill Croghan, Robin Cross, Brian Cunningham, John Curtis.

Don Danko, Jim Davies, Steve Davis, Ben Dawson, David Day, Ed De La Hunt, Brian DeNicola, Tony DeNicola, Juan Diaz, Andrew Dickens, Dan Dickey, Luke Distelhorst, Paul Dobosz, Alan Douglas, Luis Dorado, Bob Drazba, Charles Dubé, Mike Duke, Mark Durenberger, Joe Dysart, Dave Dzurick.

Marty Eby, Bill Eisenhamer, Bill Eldridge, Andy Eliason, Don Elliot, Kim Andrew Elliott.

Richard Factor, Rick Feinblatt, Peter Ferrara, Dean Field, Peter Finch, Alan Fisher, Buc Fitch, Greg Fitzgerald, Tom Fitzmorris, Ty Ford, Dave Fortenberry, Ted Foster, Frank Foti, David Freedman, Clay Freinwald, George Frese, Scott Fybus.

Philip Galasso, Brent Gardner-Smith, Dave Garner, John Garziglia, Paul Gathard, John Gatski, Jeffrey Gee, Domenic Gentile, Steve George, Karina Gerardi, David Gerety, Samantha Gerlovin, Tom Gioia, Elmer Goetsch, Bert Goldman, George Goldring, Carlos Gomes, Robert Gossett, David Grace, Morgan Grammer, Frank Grassi, Dave Graveline, Bobby Gray, David Julian Gray, Hal Green, Mark Greenhouse, John Greenya, Paul Gregg, Terry Grieger, Steve Griesbach, Frank Grundstein, Blazo Guzina.

Steve Hafen, Lawrie Hallett, Harold Hallikainen, Donna Halper, Jack Hannold, Richard Harris, Bryan Hars, Tom Hartnett, Gordon Hastings, Maurice Hately, James Hatfield, Michael Hedges, Jeffrey Hedquist, Bob Henry, Lyle Henry, Jeffrey Hermes, Dave Hertel, Neil Hever, Mario Hieb, Ben Hill, Brian Hill, John Hingsbergen, Milton Holladay, David Hollyer, John Holt, Tim Holt, Rob Hopkins, Scott Horner, Larry Howard, Paul Howard-Thurst, Dan Hubbard, Robert

From the Editor



Paul J. McLane

Hubert, Jeff Hugabone, John Huntley.

Aaron Ishmael, Paul Jackson, Don Jeerings, Jorgen Jensen, Mark Jensen, Dane Johnson, Craig Johnston, Marc Jones, Tom Jones, Ralph Jones, Gabe Joseph.

Paul Kaminski, Chris Karb, Stacy Keach, John Kean, Gary Keener, Jim Keightley, Dave Kephart, Michael Kernen, Vern Killion, Tim Kimble, Peter King, Letitia King, Bill Kingman, Gary Kline, Hal Kneller, Buzz Knight, Shawn Knight, Alex Kosiorek, Bob Kovacs, Fred Krampits, Fred Krock, Gene Kuntz.

Steve Lampen, Larry Langford, Mark Lapidus, Kevin Larke, David Layer, Chuck Leavens, Michael LeClair, Patricia Lee, Tim Lee, Bob Lee, Nicholas Leggett, Bill LeGrand, Brian Leifson, Mark Levin, Neil Lewbel, Matt Lightner, Carl Lindemann, Rolin Lintag, Larry Lomax, Jackie Loper, Vinny Lopez, Paul Lotsof, Walt Lowery, Frank Luepke, Fred Lundgren, Greg Lynam, John Lyons.

Anders Madsen, Lawrence Magne, Mark Malouf, Daniel Mansergh, John Marino, Nick Markowitz, Mel Martin, Kevin Martin, Roland Martin, Dave Mason, Jerry Massey, Greg Massey, Randy Mathena, John Mathews, Scot Mathews, Jay Mattlin, Ron Maxwell, Alan McCall, Mike McCarthy, Jerry McCarty, Robert McClanathan, Robert McDowell, Tom McGinley, Jim McLain, Barry McLarnon, Doug McLeod, Ken Meek, Bob Meister, Geoff Mendenhall, Steve Meng, Bob Mercer, Don Messer, Corey Meyer, Maynard Meyer, Paul Michels, Joe Milledge, Randal Miller, Joe Milliken, Ken Mills, Adil Mina, Ron Mitchell, Ken Moak.

See THANKS, page 5 ▶

Radio World Digital Edition



Look for the new digital online edition of Radio World coming next month. Details next time.

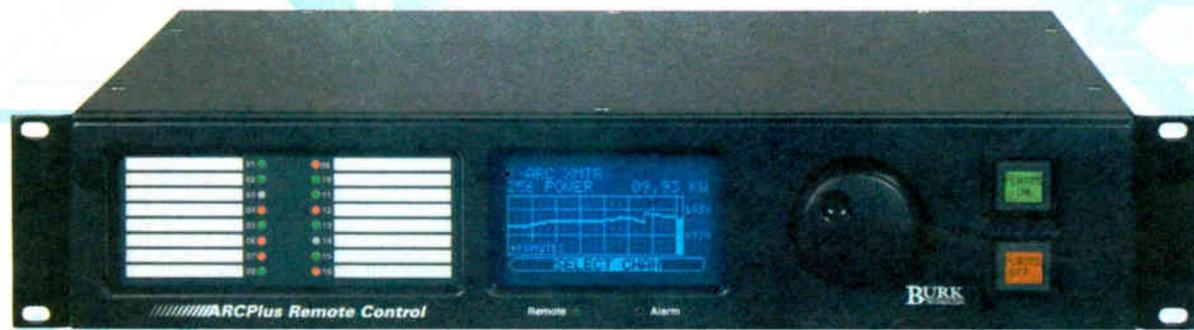
From the leader in broadcast facility remote control...

...the ARC Plus has arrived

The industry's most powerful broadcast facility remote control system is now shipping. Here's how to win one for your station.

Imagine an IP-based broadcast facility remote control system with built-in Web browser access, hardware designed for the realities of broadcast, and software that adds SNMP and network device management to broadcast facility control.

We want you to be among the first to take advantage of the Burk ARC Plus. Visit www.burk.com/ExperienceThePlus to find out how to win one for your station.



ARCPlus

BURK
TECHNOLOGY

GUEST COMMENTARY

Crafting New Media Ownership Rules

by Jonathan S. Adelstein

The author is an FCC commissioner.

The public airwaves belong to you. ... In the exchange for the free use of the airwaves, radio and television broadcasters ... are required to serve the needs of your community.

It's the job of the FCC to ensure that the airwaves foster a competitive, diverse and locally responsive media marketplace.

I attended a forum in Oakland [in October] on the future of media, and heard refreshing wisdom on the need to prevent further concentration of media ownership. The views expressed by Bay Area citizens stood in sharp contrast to the views that we hear inside the Capital beltway, where lobbyists from the largest media companies roam the city demanding even more power and size.

The FCC sets limits on media ownership that affects every citizen's exposure to news, information and entertainment programming. The laws that govern the FCC say we are to maximize the diversity of viewpoints to which Americans are exposed. We are not to allow a few media giants to dominate our media landscape.

'Greatest rollback'

As a former student in the Bay Area, I know the area is a hotbed of community involvement and activism. [The media ownership] forum was no different. It was organized by the California State Conference of the NAACP, the Media Alliance and the Youth Media Council.

While each attendee shared a different experience, everyone agreed that the air-

waves belong to the American public and that the FCC should not put narrow corporate interests ahead of the public interest.

Three years ago, over my objection and that of Commissioner Michael Copps, who also attended the forum, the FCC approved the greatest rollback of media ownership protections in the history of American broadcasting. The decision would have allowed a single owner in a community to control up to three TV stations, eight radio stations and the major daily newspaper.

This abrupt move created the biggest public uproar the FCC had ever seen. It was rejected by Congress, the courts and the public. Three million citizens nationwide, from the left of the political spectrum, to the right, and virtually everyone in between, expressed their opposition.

The U.S. Senate even passed a resolution disapproving the FCC's rules, and the U.S. House of Representatives was poised to do the same. In 2004, an appeals court sent the rules back to the FCC, and chastised the agency for its failure to make sensible rules that served the public's need for competition, localism and diversity.

We now have an opportunity to start from scratch. Yet, the FCC has not guaranteed that the public will have an opportunity to comment on specific proposals before the new regulations are finalized. We also have failed to permit a longstanding Localism Taskforce to complete its work to address the public's concerns about the paucity of local content on TV and in radio.

In the Bay Area, I heard concerns about the concentrated newspaper market in which the Hearst Corporation and

MediaNews Group Inc., control most of the regional newspapers and the news operations. The MediaNews' San Jose Mercury News has announced staffing cutbacks.

Reports say 40 news and editorial staff jobs will be eliminated. I also learned that the Latino community was particularly concerned about NBC/GE's recently announced plans to eliminate two locally produced Spanish-language newcasts on Telemundo's KSTS (Channel 48, San Jose), and to replace them with news from a centralized hub out of Fort Worth, Texas.

Have your say

The law compels us to listen to these public concerns during the course of the current media ownership proceeding.

We need to continue to hear your voice about the effects of media consolidation in your communities. Share your concerns on media ownership and inform us about the types of programs that will most benefit your local communities. I urge you to provide insight on how the FCC can best ensure an open rule-making process, so that we can serve the public interest with maximum effectiveness.

Remember, your views can influence media policy decisions that affect people ... across the nation for generations to come. I will do everything in my power to ensure that, in the pending review of



Jonathan S. Adelstein

media ownership rules, we are more receptive to the views of the public. After all, the law says we are to promote the public interest, not the interests of the media companies that use the public airwaves.

The FCC welcomes your comments on how the commission should analyze its broadcast ownership rules and could best promote locally responsive radio and television. There are no deadlines, but a final decision is likely in early March 2007.

The comment period deadline is Dec. 21. To file reply comments, go to: www.fcc.gov/ownership/comments.html.

This is adapted from the original published in the Nov. 5 San Francisco Chronicle.

Thanks

► Continued from page 4

Grady Moates, Gerry Moersdorf, Ed Montgomery, Fred Moore, Chip Morgan, Dwight Morgan, Bruce Morrow, Darren Morton, Robby Mossman, Ken Moultrie, Marian Mustoe.

Dirk Nadon, Ted Nahil, Ken Neenan, Mark Ness, Michael Newell, Steve Niemeyer, William Norman, Tom Norman, Ron Nott, Clark Novak.

Dave Obergonner, Ro Ocampo, Anthony Ochoa, Al Ogrizovich, Giancarlo Onano, James O'Neal, Tom Osenkowsky, Bill O'Shaughnessy, Phil Owens.

Gary Palamara, Ron Paley, Mark Pallock, Mike Pappas, Rich Parker, Mark Peach, John Pedlow, Dan Peluso, John Penovich, Rick Perotta, Edward Perry Jr., Ron Pesha, Alan Peterson, Adrian Peterson, Sharon Rae Pettigrew, Richard Petty, Mike Phelps, Skip Pizzi, Peter Polanco, Robert Polhamus, Stephen Poole, John Poray, Chris Prewitt, Doug Pringle.

Ken R., Mike Rabey, Ron Rackley, Bob Radil, Bob Raleigh, Chuck Ramold, Mark Ramsey, Kent Randles, Rich Rarey, Alan Rauchwerger, Tom Ray, Larry Ray, Robert Reams, David Rehr, Dave Richards, Bob Richardson, David Richardson, Noel Richardson, Gary Richardson, Robert Richer, Johannes Rietschel, George Riggins, Ed Ritchie, Mike Rivers, Robby Robinson, Rob Robson, Lauren Rooney, Dan Rose, Carter Ross, Richard Rudman, Tom Rusk, Ray Russ, Robert Russell, Jim Ryan, Marci Ryvicker.

Walter Sabo, Paul Sagi, Joe Sands, Bob Sauter, Jeremy Savage, Robert Savage, Greg Savoldi, Ron Schacht, John Schadler, Don Schellhardt, John Schneider, Ted Schober, Bob Schroeder, Jeremy Schumacher, Ed Seeger, Jim Seeman, Jack Sellmeyer, Steve Shaffer, Mike Shane, David Shannon, Ellyn Sheffield, Eric Shoars, Tim Shook, Paul Shulins, Laverne Siemens, Pete Simon, Allen Singer, Daniel Slentz, Anne-Marie Smith, William Smith, Jerry Smith, Lamar Smith, Peter Smyth, Andy Snitzer, Dennis Snyder, Jose Soler, David Solomon, Henry Solomon, Alvin Sookoo, Jobie Sprinkle, Evan Stanek, Mike Starling, Chad Steelberg, K. Dean Stephens, Leslie Stimson, Randy Stine, Darwin Stinton, John Stortz, Roger Stubbe, Roy Stype, Steve Sullivan, John Sunier, John Sutton, Stanley Swanson, Phillip Swindall.

Jack Taddeo, Tom Taggart, Keith Tate, Rolf Taylor, Tracy Teagarden, Barry Thomas, Randy Thornton, Tim Thorsteinson, Larry Tighe, Scott Todd, Ethan Torrey, Jim Tracey, Valentino Trainotti, Conrad Trautmann, Dale Tucker, Brian Turner, Max Turner, Travis Turner, Ralph Turpen, Steve Tuzeneu, Jeff Twilley, Harvey Twite.

John Uvodich, Richard Van Zandt, Christian Vang, Mike Vanhooser, Doug Vernier.

Tom Vernon, Gary Wachter, Paul Walker, Scott Walker, Bill Weeks, David Wigfield, Larry Wilkins, Jeff Williams, David Williams, Paul Williams, Duane Williams, Ira Wilner, Charlie Wilson, Homer Wilson, Jeff Windsor, Guy Wire, Jim Withers, Bill Wolfenbarger, Garrett Wollman, Jim Wood, George Woodard, Jim Woods, Charlie Wooten, Mike Worrall, Bob Wundrock, T.E. Yingst.

Broadcast Monitoring
Mobile RF Measurement
Remote control and Facilities Management

RDS Datacasting

From artist and title to advanced data applications.
We are # 1!

HD Radio
R-D-S
www.audemat-aztec.com
Miami, FL USA
Tel: 305 249 3110
ussales@audemat-aztec.com

CCR

► Continued from page 1
partners who share their longer-term objectives and vision," said Dick Blackburn, a media broker with Blackburn & Company. "Radio still produces reliable cash flow, despite facing slow growth and new technologies. That is always an attractive attribute to investors."

Radio is in a transition from a "growth investment" to a "value investment" with this sale, a sign that the industry is not sick, said Glenn Serafin, president of Serafin Bros. Inc.

"That Bain and Lee would make an investment of this size is proof that the price paid for radio (properties) is still envied by other more traditional enter-

prises," Serafin added.

By going private, broadcasters and their financial backers believe they can grow in value over the long term, without being concerned with investors' quarterly targets, said Mark Fratrick, vice president at BIA Financial Network.

He believes the sale announcement demonstrates further the belief that the strategic selling of assets, in this case 448 Clear Channel radio stations, indicates that 1,200 radio stations are just too many to effectively operate.

"You look at most of the other major broadcast groups and they have anywhere from 70 to 300 stations. That seems to be a big enough number to have the power to talk to suppliers and get good deals and yet have a reasonable number to run efficiently," Fratrick said.

Several analysts say Cumulus

Broadcasting Inc. is likely to pick up some of the Clear Channel spin-offs.

Clear Channel CEO Mark Mays said the radio properties to be sold accounted for just 10 percent of the company's total revenues.

The terms

Under the agreement, an investor group led by Bain Capital Partners LLC and Thomas H. Lee Partners LP will pay \$37.60 cash for each share of San Antonio-based Clear Channel and assume an additional \$8 billion in debt.

Clear Channel says it will sell 448 of its radio stations in 90 markets, all outside the top 100 markets, and its 42-station television group by the end of 2007; it expects some radio deals to close by the second quarter of next year.

Founded by L. Lowry Mays and Red

McCombs in the early 1970s, Clear Channel went public in 1984 and saw rapid growth throughout the 1990s as a result of favorable radio consolidation rules issued by the FCC. At one time it had as many as 1,200 radio stations and was sometimes ridiculed for wielding considerable influence within the broadcast industry.

The new owners have said that Mays' sons, CEO Mark and CFO Randy, will continue to operate the radio stations.

According to BIA Financial Network, Clear Channel Radio recorded more than \$3.5 billion in revenues in 2005.

Bain Capital has a long track record in media and communications, said John Sanders, an analyst with Bond & Pecaro.

Clear Channel purchased all or parts of Jacor, Chancellor, Nationwide Media and other well-known broadcasters on its way to building its historic station count. Estimates are that the company spent nearly \$30 billion to become the largest radio operator in the United States.

The merger must be approved by Clear Channel shareholders and the FCC. Several shareholder groups immediately filed suit against Clear Channel after the announcement, claiming management did not accept the best possible offer. In addition, the company had until Dec. 7 to solicit competing proposals. 🌐

Ownership

► Continued from page 3

The Walt Disney Company, Burbank, Calif.:

The Walt Disney Company, through subsidiaries, owns television stations in 10 markets. Disney also owns The ABC Television Network. ... Disney also owns 74 radio stations ... through subsidiaries. ...

The Walt Disney Company is not advocating and does not seek any relaxation of the commission's broadcast ownership rules. ... Disney has not bought a television station in more than 10 years. Disney sold any interest in newspapers years ago. Disney also entered into a contract to divest a large number of its owned radio stations.

Given the increase in, and attractiveness of, new media outlets, in Disney's view, the commission may soon find itself considering ways to incent, rather than restrict, ownership of over-the-air broadcast stations.

American Women In Radio And Television, McLean, Va.:

Many of the rules adopted by the commission in the 2002 Biennial Review Order would permit greater ownership concentration among large media owners. AWRT firmly believes that permitting greater concentration of ownership in the radio and television industry deserves the American public by reducing diversity — diversity of ownership, diversity of programming and diversity of viewpoints.

Nonetheless, in these comments, AWRT does not address the majority of issues raised by the Third Circuit with respect to the rules adopted in the "2002 Biennial Review Order" because those issues relate to justifying the adopted rules — rules that will only lead to greater media concentration. Rather, AWRT believes that the commission

See OWNERSHIP, page 8 ►



From New York to Alaska, Logitek fits just right.

Logitek's Console Router Systems can be scaled for any size application, whether it be 24 networked Audio Engines in the USA's top market or a single engine and control surface in Barrow, Alaska, the northernmost radio station in the USA. With our flexible architecture and affordable prices, Logitek is just right for your market. Logitek Console Router Systems, 1300+ systems strong. You should be next.

Logitek Electronic Systems, Inc.
5622 Edgemoor • Houston, TX 77081
713.664.4470 1.800.231.5870
info@logitekaudio.com www.logitekaudio.com

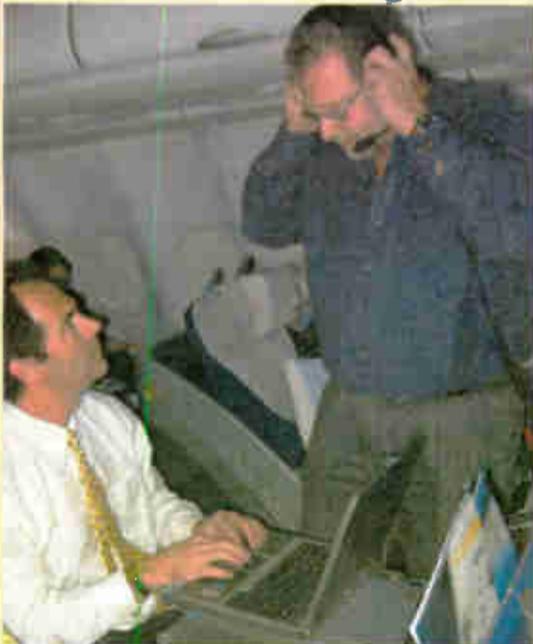
© 2006 Logitek Electronic Systems, Inc.


Logitek
Console Router Systems

Internet remotes... there's been talk.



➔ Live from 37,000 Feet— No kidding—Live Broadcast from a Lufthansa flight!



... successfully aired his three hour talk show from a commercial airplane [using ACCESS] at 37,000 feet on a regularly scheduled flight between Frankfurt, Germany and New York, US.

Peter Greenberg—Host of the syndicated radio program Travel Today

For the complete story visit
<http://remotebroadcasts.blogspot.com>

➔ Radio Free Asia—Live from the Himalayas



"The results [with ACCESS] were especially reliable considering that Dharamsala has one of most "problematic" Internet infrastructures that we have come across." — David Baden, Chief Technology Officer Radio Free Asia

For the complete story visit
<http://remotebroadcasts.blogspot.com>

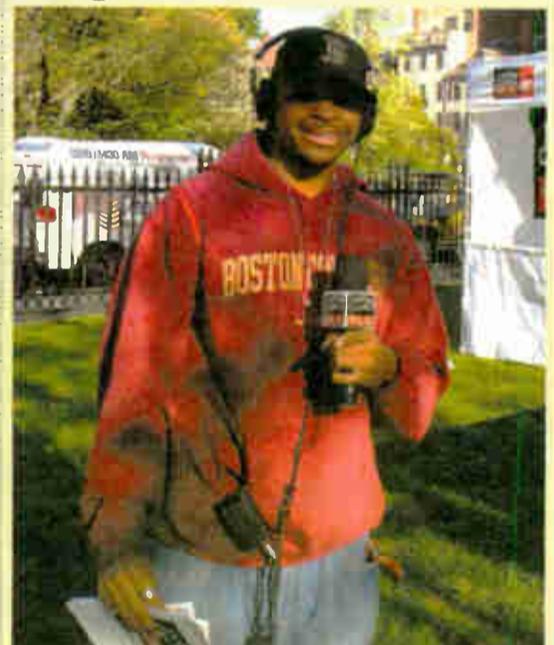
➔ Ski Mountain Remote



This picture, really demonstrates what ACCESS is about. This product truly has the ability to cut the wires.

For the complete story visit
<http://remotebroadcasts.blogspot.com>

➔ JAMN 94.5—Walk for Hunger



"ACCESS was used on the air exclusively for JAMN945 at this one. It was all over EVDO with a tremendous amount of active cell phones in the area. The ACCESS was connected to the Verizon wireless Broadband...

For the complete story visit
<http://remotebroadcasts.blogspot.com>

Put Comrex On The Line.

Green

► Continued from page 1

cles when possible and establishing working groups to explore energy conservation options.

Entercom, which like other broadcasters has a substantial appetite for energy, is being fiscally and environmentally responsible, company officials say, by practicing conservation whenever and wherever possible. The group, which has 120 radio stations in the United States, is aggressively pursuing policies to cut energy consumption.

"We are trying to strike a reasonable balance to keep both costs and our carbon emissions down. As a company, we are looking at not only operating costs but the carbon footprint, which is determined by looking at all energy usage, from natural gas and electrical use to fuel for station vehicles," said Marty Hadfield, vice president of engineering for Entercom.

Heating, cooling

The broadcaster launched an initiative in 2004 to install overnight and weekend HVAC shutdown and limited cycling systems in general office areas. Entercom also installed passive infrared sensors, which turn on lights in occupied spaces, Hadfield said.

"We've also completed converting close to 90 percent of our incandescent tower lighting systems to LEDs, which [results in] a 75 percent reduction in energy con-



Chris Tarr is Entercom director of engineering for the Milwaukee and Madison, Wis., clusters. Here he tweaks an Optimod 8200, testing the audio processing on the HD2 service of WMMM in Madison.

sumption. It also yields the advantage of a reduced replacement cycle," Hadfield said.

With electric bills running in the thousands of dollars for its clusters of stations, the 10 percent reduction in energy as a result of the initiative has been noticeable, he said.

"It's hard to calculate the cost savings, because energy costs more or less depending on where in the country you are. However, in the Pacific Northwest,

we know our carbon footprint is smaller because much of the energy comes from renewable resources like hydroelectric. And in other states we use wind energy when it's available on the grid," Hadfield said.

CEO David Field spearheads the energy conservation drive at Entercom. "David has been very keenly involved in energy reduction efforts. But it really is something many of us in the company have adopted as our own. We are looking for ways to lower our global impact and this is a great way to do it," Hadfield said.

Entercom has circulated suggestions and guidelines for conservation and reduced use of hazardous cleaning materials, Hadfield said.

In Wisconsin, Entercom has partnered with Alliant Energy in a program called "Second Nature." The program is aimed at businesses in the state to support the growth of clean energy from wind, solar and biomass, said Chris Tarr, Entercom director of engineering for the Milwaukee and Madison, Wis., clusters. Biomass most commonly refers to plant material grown for use as biofuels, such as ethanol.

Alliant purchases wind energy from more than 300 large-scale wind turbines located at 15 wind farms in the upper Midwest. As energy comes into the energy pool from nearby wind farms, it displaces electricity that would otherwise come from sources like coal, natural gas and nuclear, according to the Alliant Energy Web site.

"We can't get energy directly from the wind farm, so we pay credits to the energy company that go towards purchasing energy from wind farms near Madison to put back on the grid," Tarr explained. "It's a back-end deal. They calculate our energy usage and our credits then pay for that much electricity from the wind farm."

'Second Nature'

Madison is an environmentally conscious community, Tarr said, a university town with many environmentally active groups. Entercom's WMMM(FM) even has a "Triple M Green Team" that does a lot of cause marketing. The station heavily promotes Alliant Energy's "Second Nature" program.

"We have a station vehicle that is a hybrid car that runs on ethanol. Wisconsin

is a huge corn-producing state, so that ties in, too," Tarr said.

The Madison cluster, which includes WMMM, WOLX(FM) and WCHY(FM), has converted to a paperless data and record storage system, put timers on water heaters and unplugged obsolete equipment.

"For instance, we had an AM distortion monitor plugged in and running at the transmitter site. We really didn't need it on all the time so we unplugged it. We have found that the little things do add up. It really isn't painful at all," Tarr said.

Entercom officials acknowledge there is only so much energy conserving that radio stations can do, noting that their facilities need a steady and even flow of electricity to function.

"Unfortunately, solid-state transmitters for FM are almost across the board less efficient per watt output than tube type transmitters," Hadfield said. "HD Radio in particular is less energy efficient. They need a flatter pass band, so the power handling capability for those transistors is less efficient. We are trying to work with the transmitter manufacturers to see if we could come up with new schemes of modulation techniques, power supply techniques and cooling techniques."

The company is also looking for efficiencies in cooling their transmitter buildings. At least one transmitter manufacturer, Continental, is producing liquid-cooled tube-type transmitters, Hadfield said, which would help reduce air conditioning demand for the building.

Entercom isn't the only broadcaster encumbered by high-energy bills and taking steps to conserve and preserve when possible. Officials for Citadel Broadcasting, Cox Radio and Cumulus Media said their respective groups are always looking for ways to be energy and environmentally conscious.

See past articles on energy savings for broadcasters. Go to radioworld.com, click on Tech Tips and scroll to the "Energy Special" articles.

Ownership

► Continued from page 6

should address the concerns raised by the Third Circuit under the guiding principal that any rule or policy changes implemented by the commission should have an underlying goal of encouraging acquisition opportunities in local markets for independent companies, particularly those owned by women.

The commission must keep this focus because the number of women-owned broadcast stations was indefensibly small before the 2002 Biennial Review and there has been absolutely no improvement in the number of women-owned broadcast firms in the intervening years. The commission's failure to adopt a program to promote acquisition opportunities for women-owned companies is contrary to the overriding public interest policy of maintaining robust and diverse local radio and television industries.

File reply comments until Dec. 21 on MB Docket 06-121 via the FCC Web site, www.fcc.gov.

got wire?
cables & connectors
racks
tools
problem solvers
test gear
& much more
www.systemsstore.com

PREVENT BROADCAST DOWNTIME WITH

STABILINE®

POWER QUALITY SOLUTIONS

Transient Voltage Surge Suppressors



CS1 Series / Service Entrance Protection

- Parallel Connected
- 60 to 300kA Surge Current Capacity
- Single & Three Phase Models
- All Mode Protection
- Individually Fused MOV's
- NEMA 4X or NEMA 4/12 Enclosure

Automatic Voltage Regulators



WHR Series / Transmitter & Facility Protection

- Rugged & Robust Technology
- Single & Three Phase Models
- 2 to 1,680 kVA Capacities
- 19-Inch Rack Mount Models
- Narrow & Wide Input Correction Ranges
- High Overload Capability



Superior Electric

383 Middle Street, Bristol, CT 06010
Phone 860-585-4500 • Fax 860-582-3784
www.superiorelectric.com

“Everything is bigger in Texas. Except equipment budgets.”

“I’d gotten the green light to build new studios for our South Texas radio cluster. We wanted the ability to **put any of our stations**



on air from any studio, so we started investigating networked audio.

“Also, management said we might add more stations to the cluster, so I needed a system that could be **easily and affordably expanded** later on.



“We looked at several systems. Some did what we wanted, but were very complex and required us to buy their expensive routing mainframe, whether we were building lots of studios or only a couple. That was completely outside our price range.



“Then we looked at Axia. They showed us how an IP-Audio system would let us **share audio sources, switch air studios quickly,** even **customize console settings** for individual jocks. And Axia **cost about half** what some companies wanted us to spend.

“Of course we were a little skeptical — **how often is the least expensive solution actually the best?**

“Then we learned that Axia’s Ethernet backbone scales, like a computer network. All we’d have to do to grow is connect more nodes and surfaces, maybe add another Ethernet switch. We didn’t have to commit to buying equipment for all of our studios at once .



“So we built one studio using Axia, and **it worked great.** Went together fast and smooth. A few wrinkles during installation were ironed out by Axia support right away. Those guys were amazing. It was like their entire team was there to make sure I was happy.



“**We liked Axia so much** we installed a second studio. Then a third. Then a whole second cluster. My colleagues are so impressed with how well Axia works, they want it in their stations, too!”



— Jorge Garza, Univision Radio, McAllen, Texas



www.AxiaAudio.com

Not Such a Silly Goose

by John Bisset

We're approaching the time of year when access to transmitter sites may be restricted by the weather. Gary Wachter of Service Broadcasting in Dallas came upon a useful discovery while searching for a transmitter site humidity sensor. A company called IT Watchdogs Inc. manufactures innovative monitoring tools. Their site is www.itwatchdogs.com.

and connect to the network to be viewed on a Web browser.

Additional sensors such as AC power monitoring, current loops, airflow and temperature plug into RJ-45 connectors using the Dallas Semiconductor I wire system. Contact closure inputs are also available for door sensors or relay closures. A Webcam can be attached for a snapshot view.

The data is charted and recorded with



Fig. 1: The Goose (top) is compact and will fit nicely in the back of a rack.

The basic \$199 WeatherDuck measures temperature, humidity and air flow. The sensor terminates on a DB-9 connector that is plugged into the serial port of a computer. Client software is run for monitoring.

The company has some other products with strange names, including the WeatherGoose and SuperGoose. These products have additional sensor inputs

one-month storage capacity. Alarms can be set and an e-mail sent upon tripping.

Gary installed the SuperGoose at KRNB(FM), one of his more distant transmitter sites. As seen in Fig. 1, it occupies one rack unit and is about 2 inches deep. It's easily hidden in the back of a rack.

In addition to the internal sensors, See GOOSE, page 11 ▶



Fig. 2: Software links the Goose to a computer or the Web.



Fig. 3: Larger UPS's have a sensitivity adjustment

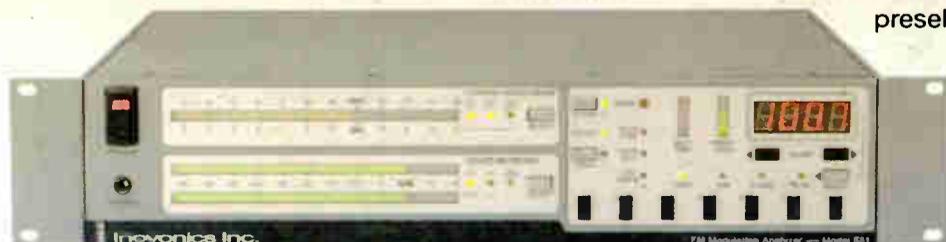
Top-Value FM Monitor

Retains FM measurement accuracy with IBOC digital broadcasting*

Compatible with...

IBOC

DIGITAL RADIO



A wealth of features makes Inovonics' second-generation 531 the undisputed value leader in FM monitoring. In addition to the high-resolution total-mod display, the 531 also shows stereo audio levels, SCA and RDS subcarrier injection, plus a relative indication of incidental AM noise. A digitally-tuned preselector with programmable presets lets you quickly compare your station's parameters with those of market companions.

*+4% max. Total-Mod offset with IBOC carriers on.

Model 531 - \$2700

Inovonics
1305 Fair Ave. • Santa Cruz, CA 95060
TEL: (831) 458-0552 • FAX: (831) 458-0554
www.inovon.com • e-mail: info@inovon.com

Visit www.inovon.com for full technical details.

Goose

► Continued from page 10

Gary added a temperature airflow sensor and placed it in front of the main A/C exhaust grill. It soon revealed a problem with the A/C. It turned out that the airflow rates were swinging wildly due to the coils freezing. The temp sensor on the existing remote control showed just the normal average temperature.

The only shortfall with the device is that it is "monitoring" only. There are no alarm or control outputs (except an internal buzzer). But its monitoring capabilities have freed up a couple of positions on the transmitter remote control. Fig. 2 shows the monitoring software operating on the KRNB computer.

Not only is the device great for the transmitter site, but Gary suggests adding one to the studio rack room or server room.

Gary Wachter is director of engineering for Service Broadcasting. Reach him at garyw@k104fm.com.

★★★

At a recent nuts-and-bolts discussion at an SBE conference, the issue of a UPS not accepting generator power came up. Elmer Goetsch is chief engineer at WXPR(FM) in Rhinelander, Wis. He encountered a similar problem a few years ago.

Elmer installed a 5 kW Generac natural gas backup generator at the WXPR studios, where he has quite a number of APC UPS's, including a large one powering critical on-air equipment, similar to that shown in Fig. 3.

What Elmer discovered was that nearly all recent (and larger) APC units have a "sensitivity" switch. This is usually a "dip" or pushbutton switch assembly that is accessible through the back panel. Desensitizing the UPS solved the problem.

WXPR's 2 kW APC UPS is fairly old and lacked the sensitivity adjustment. Elmer was able to get it to accept the noisy Generac waveform by installing a Kleen Line Isolator-Conditioner on the UPS input. It removed enough of the noise to make the UPS happy. Electronic Specialists is a distributor of Kleen Line conditioners. You'll find them at [www.elect-spec.com/klr_\\$.htm](http://www.elect-spec.com/klr_$.htm)

Elmer Goetsch is at elmerag@dwave.net.

★★★

Bill Bowin is the market chief for North American Broadcasting's stations in Columbus, Ohio. He experienced an extended power failure (>16 hours) at the main transmitter site, and operated from the backup site during this time.

However, when power returned, the main transmitter didn't. The transmitter was a 1988 Harris 20K2. It turned out that the transmitter's phase monitor relay wouldn't close.

This sensing relay will keep a transmitter off the air if any of the three electrical phases of AC power are missing. Although these relays are great for protecting transmitters against electrical phase loss, they are not tied into the transmitter alarm system, so unless you know it's there, you can spend hours searching for why the transmitter won't turn on.

As it turns out, this particular phase monitor relay, which Bill points out is similar to but not manufactured by SSAC, contains a 160 volt/33uF electrolytic capacitor that had dried out. Bill had replaced all the electrolytics in this rig previously but was unaware that this capacitor existed.

Bill repaired the old relay and ordered a new one to have on the shelf. You can bet that he'll be checking other time delay and phase monitor relays for these "hidden" capacitors. Bill's "shotgun" approach to replacing all the old electrolytics in his transmitter is a good idea.

After about seven years, the electrolytic material will dry out; failure will result. There are certainly cases where these capacitors will last longer, but the stresses these components are under — from power spikes, inrush currents or surges —

make them a major point of failure.

I remember one of the FCC Second Class License questions: "Which component has the highest failure rate?" Tubes, resistors, coils and capacitors were the choices. The correct answer was capacitors. Enough said!

So, as Bill suggests, when you're troubleshooting check your voltages first, then look for that wayward electrolytic capacitor. He can be reached at bbowin@nabco-inc.com.

John Bisset has worked as a chief engineer and contract engineer for 37 years. He is the northeast regional sales manager for Broadcast Electronics. Reach him at (571) 217-9386, or jbisset@bdcast.com. Faxed submissions can be sent to (603) 472-4944. Submissions for this column are encouraged, and qualify for SBE recertification credit.

Letters to the Editor

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

Letters should be 100 to 300 words long; the shorter the letter, the better chance it will be published in full. We reserve the right to edit material for space. Longer commentaries are welcome but may not reach print as quickly.

Include your name, address and contact information, as well as your job title and company if appropriate.

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



Meet your new revenue.

Between now and the end of the year, get more bang for your budget with Broadcast Electronics. With our 'All The Good Stuff and More' promotion, we're making it easy to implement your profit-making ideas—plus a few that you've yet to consider. Contact BE for details and to get started today.

All the Good Stuff & More

Buy or upgrade an AudioVAULT system and get things you need. **FREE!**

There has never been a better time to invest in the industry's most reliable choice in radio automation. Whether you are a first-time AudioVAULT user; are upgrading a legacy AV100; or expanding your current Vault system, BE will "supersize" your purchase based on the total package price.



Sign up for Tunefly and get a 60-day **FREE** trial of TRE Message Manager.

With Tunefly, you can let your listeners know when their favorite songs or programs are about to play via email or text messages! Tunefly includes off-air dedications and contests. With practically no up front investment, Tunefly is major market promotion for stations of all sizes.



Buy an RDi 20 RDS encoder and get a **FREE** Now Playing Messagecasting license **PLUS** a 60-day **FREE** trial of TRE Message Manager.

BE's TRE RDi 20 Advanced RDS encoder, when coupled with software from BE's The Radio Experience, is a Messagecasting powerhouse. Whatever your messages, it's never been faster or easier to deliver them to listeners, billboards and other platforms.



Broadcast Electronics, Inc. • 410 North 24th Street P.O. Box 3606 Quincy, IL 62205 U.S.A.
Telephone: (217) 224-9400 • Fax: (217) 224-9407 • E-Mail: bdcast@bdcast.com • www.broadcast.com

Bob Royal's 60 Years at WPTF(AM)

by Ken R.

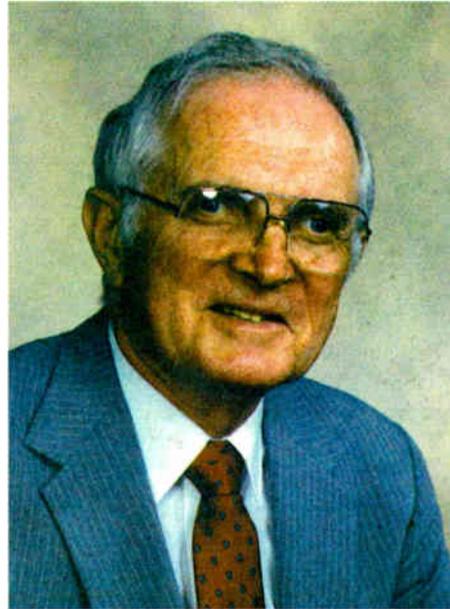
The Andrews Sisters and Glenn Miller sat atop the Billboard chart. FM didn't exist and commercials were cut live to 78 rpm wax disks. That was in 1942, the year a young man named Bob Royal started as an engineer at WPTF(AM), Raleigh, N.C.

The world changed a great deal over the next 60 years, but in 2002 Bob Royal was still working at the same radio station. He retired later that year.

Royal passed away on Oct. 3. Radio World was scheduled to interview him



Royal, right, and Jimmy Johnson work in the WPTF master control room circa 1984.



Bob Royal

We tried to get Bob to write about the station's history but he wasn't too interested in that.

He was always looking to the future.

Maybe that's why he lived to be 84.

— Don Curtis

the following week to collect recollections about his long career.

Looking ahead

Don Curtis owns Curtis Media Group, which purchased WPTF in 1991. He worked with Royal and remembered him as a man who never dwelt on the past.

"He wasn't one of those old guys who sat around and talked about the glory days, even though he went way back to when Chet Atkins had a daily live guitar show here," he said. "We tried to get Bob to write about the station's history but he

wasn't too interested in that. He was always looking to the future. Maybe that's why he lived to be 84."

Curtis said WPTF moved its studios three times during Royal's tenure.

"The original building had a pipe organ in the main studio and could seat 150 people," he said. "The station moved out of there in the early 1960s."

Gary Liebisch, now a product manager at Harris, was Royal's supervisor and WPTF's chief engineer from 1985 until 1997.

"He was a great guy, very dedicated,"

Liebisch recalled. "He never let his age or anything related to his physical condition get in his way. In fact he ran circles around the other guys. He took a lot of pride in the sound of the station and would work long, hard hours to set up our remote broadcasts. I didn't really appreciate how good he was until I moved on to the next station."

A respect for history

"Sometimes you have to know where you came from to know where you're going in radio," said Eddie Harrell, who worked as an engineer at WPTF from 2001 until 2005. "Bob was one of the old-school guys who knew telephones and vinyl records. But he was always there, every time you asked him to do something."

"He was a giving person," said Jimmy Johnson, who now owns a station and operates two others in North Carolina. "He gave me my first assignment in radio, setting up football and basketball broad-

casts for North Carolina State University games. I once mentioned to him that I was looking for a car for my father. Bob just gave me one he had and said he was going to buy a new one anyway. I couldn't believe it. He was more than just an employer, he was like family."

Royal specialized in studio work and remote broadcasts, according to Chris Waldrup, who spent three years at his side. "He didn't want new technology to pass him by so he went out and bought that set of learning CDs and taught himself about computers," said Waldrup.

While not generally known for being a big joke teller, Royal could come up with the occasional funny line.

"My wife was working at my station back in the days when cell phone long distance was expensive," said Curtis. "One time she didn't hit 'end' after a call so the line was left open a long time and it cost some huge amount like \$125 when we got the bill."

"I ran into her office and started yelling about it, but what I didn't know was that Bob Royal was under her desk working on something. I was going on and on, and Bob eventually leaned out from behind the desk and said, 'Well, the way I see it, you could fire her, but she'd probably get a divorce and end up owning half the company. Then she could make as many calls as she wanted!'"

In his early years, Royal served as a sergeant in the U.S. Army as a radio technician, according to the Raleigh News and Observer. He is survived by his wife of 63 years, Kathleen. Memorial contributions can be made to Highland United Methodist Church, 1901 Ridge Road, Raleigh, NC 27607.

Ken R. is a former broadcaster who can be reached at ken@kenr.com.

Service Bulletin for DaySequerra M2

DaySequerra issued a service bulletin to let users know of a potential component problem that may affect certain M2 HD Radio modulation monitors.

President David Day said a printed circuit board was causing some field failures.

DaySequerra said the bulletin applies only to M2 units produced with a particular production lot of PCBs. Units can be shipped back to the factory for replacement of the potentially faulty board.

Day said users can check to see if their unit is affected. "If you have an M2.0, M2.1 or M2.2 with a serial number between D19987 and D20146, please remove the top cover and look at the revision level on the A2 PCB, the second PCB from the right of the unit, looking from the front of the M2," Day stated.

"If the A2 is revision E, the M2 can be returned to the factory for replacement of the A2 PCB. Please e-mail your serial number and contact information to us at support@daysequerra.com and we will issue an RA number and schedule your M2 for this A2 PCB replacement."

The company is extending warranty coverage for this particular problem for the life of these M2 units; any future problem will be covered even if the unit warranty has expired.

Worried about Translator Hijacking?

The recent flood of cheap FM repeaters for Satellite radio and MP3 players has raised the risk of someone overpowering your distant translator source with inappropriate content.

With our RBDS encoder at your station and an RD10 RBDS Receiver/Decoder at each translator, you can automatically mute the translator if the received signal has been hijacked or overcome through atmospheric skip.

The RD10 is available now for only \$395 for the Serial version, \$475 for the USB version.

Visit www.viaRadio.com or call us at (321) 242-0001 for more information.



viaRadio
Radio Data Systems

ViaRadio Corporation tel (321)242 0001
760 North Drive, Ste B, Melbourne, FL 32934 www.viaradio.com
Specializing in RBDS solutions

We're all talk.

And all action, too.

All talk and no action? That certainly doesn't describe any radio station we've ever seen. With guest interviews, news and traffic feeds, live reports and listener calls to juggle, a talk studio is one of the most active places on the planet. Seconds count, and there's no room for mistakes.

That's why we created Status Symbols® for the Telos TWOx12 Talkshow System. Instead of flashing lights to decipher, there's easy-to-understand picture icons that give talk pros the information they need with just a glance. What caller's next? Who's screened, and who's just holding? With Status Symbols, you'll know instantly. And only Telos has them.

TWOx12 has lots more benefits. Like Digital Dynamic EQ, for uniform caller audio despite less-than-perfect lines. Twin DSP-powered hybrids for quick, no-hassle conferencing. A unique Dual Studio Mode that lets you use your 12-line phone system like dual six-line systems for extra flexibility. And TWOx12 is the world's only talk show system that can work with either POTS or ISDN lines to deliver exceptional caller clarity. Impressive? You'd expect no less from the company that *invented* the digital broadcast hybrid.

Is TWOx12 the perfect union of word and deed? Thousands of broadcasters worldwide think so. Why not see for yourself?

Telos
AUDIO | NETWORKS



12 lines, two digital hybrids, and superior audio performance. Desktop Director controller features handset, speakerphone and headset jack. Drop-in controls available for popular consoles.



New Call Controller has Status Symbols, DTMF pad and recorder controls (like Desktop Director), but lets talent use their favorite wireless phone or any standard handset for call screening.



Status Symbols show exactly what's what. Intuitive icons show calls locked on-the-air, which hybrid they're on, who's next in queue and more. So much better than a panel of blinking LEDs.



Assistant Producer enables talk show production via LAN or WAN. Status Symbols, Caller ID support, instant messaging and caller database are just a few benefits. Supports touchscreens too.

FIRST PERSON

Turntables and Radio in the 1950s

by Fred Krock

Microphones aside, little of the equipment seen in radio control rooms of the 1950s can be found in stations today.

Among the first things you noticed then were phonograph turntables. Most stations had several. The turntables could play 16-inch transcription discs. Most were mounted in freestanding cabinets, a few were built into tabletops.

Before tape cart machines became available, most top-40 stations had three or even four of these turntables in the control room. Two were used to play music; the others were used for spots and any production effects used.

Most turntables had two or even three tone arms. Each arm had a different pickup cartridge and stylus (needle). One arm was for transcription discs and 78-rpm records, one was for microgroove records. If the station used Associated transcriptions, a third arm might be used to play vertical recordings.

(Associated Transcription Service supplied music to many radio stations for a monthly fee. Other such services were RCA Thesaurus, Capitol, Standard and Lang-Worth.)

Early "record" machines used a needle that moved up and down to impress on



A Gates 16-inch turntable loaded with a 1957 'Stars For Defense' show featuring Jaye P. Morgan and complete with Civil Defense triangle.

and track the impressions from the recording media. Another term for this type of recording was "hill and dale" or "vertical recording." Many early phonograph records were recorded vertically.

Later research discovered that moving the needle back and forth horizontally with a constant depth groove produced better results. These were called "lateral" recordings. Many records after about 1910

were lateral recordings.

Associated transcriptions came on 16-inch clear red vinyl discs. They were recorded vertically. Apparently Associated didn't want to make their old disc library obsolete, so it stuck with vertical recording to the end.

Both RCA and Western Electric sold phonograph pickups that could be switched to play either vertical or lateral recordings.

Tone arm selector and playback equalization switches usually were on or next to the turntable. Two equalization curves, AES and NAB, were among those in common use. (The RCA Orthacoustic recording curve was similar to that of AES.) Equalization controls usually included two filter positions to reduce surface noise. Filter position No. 1 was a low-pass filter. No. 2 was a very aggressive low-pass filter.

About 1948 General Electric started selling a variable reluctance phonograph cartridge. The professional version had a chrome-plated shell rather than satin finish. It also had a different internal inductance than the home version.

Gray Labs made a passive equalizer that could be connected between a GE professional cartridge and a console microphone input to produce flat frequency response from a phonograph record. The result was much better sound quality than could be produced by most existing broadcast phono pickups. Some said you could tell by listening when a station was using GE pickups.

The GE pickups were a lot cheaper and more rugged than the Western Electric or RCA pickups. The stylus could be replaced quickly in the field if it were damaged. The GE cartridge allowed you to use two different stylus sizes, changing size by a "push-and-twist" action.

Before long GE pickups had replaced most of the other pickups except those needed to play vertical recordings.

Gray Labs also made a tone arm that was unique in that it was viscous-damped by a thick silicone fluid.

Spritz, spritz

Most control rooms had a sprinkler bottle of water handy. If a really noisy record had to be played, water would lubricate the surface and reduce the noise. A bottle of alcohol usually was available to wipe off fingerprints on vinyl recordings. Early in my career I grabbed the wrong bottle and applied alcohol to a noisy shellac 78-

rpm record. It really reduced the noise. The groove dissolved before the record finished playing.

In 1950 cue pots were not available in most broadcast consoles. You had to put the console channel selector switch into audition and turn up the fader. Then the procedure had to be reversed to play the record on the air.

When operators got careless, the result was cueing records on the air or forgetting to switch back to program and missing the start of the record. Occasionally an operator would play an entire record in audition and not realize that it was not on the air.

Some turntables had a spring-loaded lever switch to cue records. It would connect the turntable to a separate amplifier and open the circuit to the console. Records could not be cued on the air by accident and operators only had to release this switch to play the record on the air. It was a big help in reducing operator error.

RCA, Presto, Rek-O-Kut, Fairchild and QRK made common broadcast turntables. All could be switched to play at 33-1/3 or 78 revolutions per minute. When RCA 45-rpm records became common, the manufacturers sold adapters to allow their turntables to play these records.

RCA turntables had a large synchronous motor in the base with a gear drive turning the central shaft. The one big virtue of RCA turntables was that the speed was extremely accurate and never changed.

Speed and rumble

Most other turntables ran slightly faster than their nominal speed. Nothing was worse than trying to make a network join on time when a transcribed program ran longer than specified.

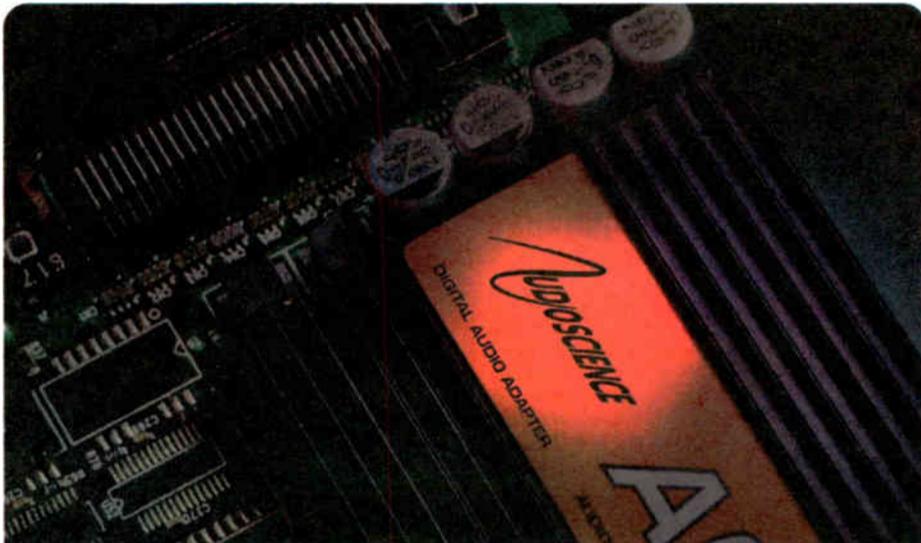
Some top-40 stations modified their turntables to run a little fast. Theoretically the music sounded more exciting with a faster beat. It also allowed the station to play more records in an hour than the competition and that provided more time for commercial breaks.

When stereo long-playing records came on the market (the stereo pickup angle a combination of "hill-and-dale" and lateral), the RCA turntables were marginal performers because of excessive vertical rumble. They had been designed to minimize rumble in the horizontal plane at the expense of vertical rumble.

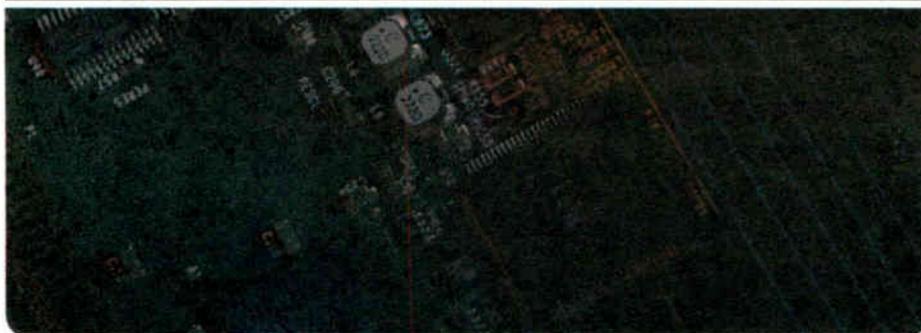
RCA turntables had a rubber shock absorber between the gearbox and the platter to reduce rumble caused by gear noise. Because of all the mass involved, RCA turntables took at least two revolutions to come up to speed at 78 rpm. Records had to be slip started with RCA turntables. You would cue up the record, then hold it from revolving while the turntable came up to speed. On cue you would let go of the record and turn up the fader at the same time.

The friction between the record and the turntable platter would load the rubber shock absorber. When the record was released, the extra energy stored in the shock absorber also would release, causing the turntable to overspeed for an instant and then slow down to speed. You could identify stations on the air playing

See TURNTABLES, page 18 ▶



CRITICAL COMPONENT. Professional audio requires the best equipment. The AudioScience name is your guarantee of pro-level quality. Every card we make is Built for Broadcast™ with innovations including MRX Multi-Rate Mixing and Soundguard transient voltage suppression. No one offers more broadcast-centric features or connectivity options. When selecting audio equipment, check the name on the card. When it's AudioScience, you've made the right choice. Learn more by calling +1-302-324-5333 or visit www.audioscience.com.



BUILT FOR BROADCAST

www.audioscience.com

AUDIOSCIENCE
Audio Engineering
Since Excellence

got racks? cables & connectors
racks
tools
problem solvers
test gear
& much more
www.systemsstore.com

250 studios already?

Time flies when you're having fun!

Hard to believe, but we passed the 250 studio mark recently. We're told that it's a major milestone, but we prefer to call it a good start.

In fact, our clients have made Axia the **fastest growing console company** in radio. To you, we say "thanks" for your trust and enthusiasm. And to those of you who aren't yet clients: we're ready when you are.

Okay, back to work now. (Consoles don't build themselves, you know.)



www.AxiaAudio.com

TMS Takes a Different Track

Radio Finds an Improved Home for Covering Stock Car Racing at Texas Motor Speedway



by Paul Kaminski

Stations not affiliated with the radio broadcast rights holders for NASCAR Nextel Cup races — Performance Racing Network (PRN), Motor Racing Network and the Indianapolis Motor Speedway Radio Network — can now tap into the stock car racing phenomenon with help from Texas Motor Speedway, outside Fort Worth in Texas, and the vision of an auto racing veteran.

Speedway Motorsports Inc. opened Texas Motor Speedway — also known as TMS — in 1997. The track completed work on a radio and television broadcast facility, the Time Warner broadcast center, just in time for the Nov. 5 Dickies 500 Nextel Cup race. For the Dickies 500, TMS issued 700 media credentials, with 200 of them going to national and local broadcasters.

Mike Zizzo brought experience in media relations management at Championship Auto Racing Teams and NASCAR when he joined TMS as its director of media relations.

"I had the chance to visit media facilities throughout the world," he said.

"The one major aspect I saw absent at nearly all was a quality facility for both visiting television and radio media. All have a media center that focuses on the print outlets and some will encompass TV and radio in the same room.

"I felt there was a need to provide TV and radio with their own facility — their own home — with first-class accommodations." He said they wanted to make Texas "a destination track for both TV and radio media outlets alike." Before this half-million-dollar project received the green light, broadcasters and print journalists here shared space with each other, as they do at many other facilities.

Accommodations

Broadcasters in the center are not directly competing with the rights holders doing the live lap-by-lap and pre- and post-event coverage.

Given the softening audience for NASCAR Nextel Cup telecasts in general, the strategy seems to be a back-to-basics promotional approach. Zizzo said the radio studios were not intended for outlets to broadcast live during the

events and infringe on PRN's live lap-by-lap broadcast rights. "They are intended to give radio outlets a studio to air their daily shows and race updates directly from the racetrack. The concept was to give us the ability to make it easier and more accommodating for our local, regional and even national media to cover our events. For instance, regional TV stations from such key markets as San Antonio and Houston no longer have to dedicate a truck to our race weekend if they want to cover the event thanks to the fiber setup.

"As for radio," he continued, "we needed to give them a good working environment if they are willing to take the time to come to our events. We also are optimistic that the work environment will have more national radio and or TV outlets choose our races to cover because of the facilities." His concept was backed by Speedway Motorsports Chairman O. Bruton Smith and TMS President Eddie Gossage.

The Time Warner Center — so named because the corporation bought the naming rights — overlooks Victory Lane at Texas and includes seven fiber optic-equipped studios for television (two of which can convert to radio studios), four large radio rooms on the

lower level, a multi-purpose room and a 30-place "broadcast deadline" room for radio and TV reporters with shared monitors, Internet and telephone access.

Zizzo says the four dedicated radio rooms have telephone, Internet and ISDN access, as well as timing, scoring and video monitors. "We also piped in ambient sound of on-track action for those who might need it," he said. The added insulation is augmented by egg-crate foam to reduce unwanted sound. Those studios are plug and play, says Zizzo. "Our broadcast coordinator, Dawn Gardin, schedules use of the rooms, so all those broadcasters need to do is bring their remote equipment and order the ISDN, the wiring for which is already installed."

Texas Motor Speedway selected Stuckey Architects of Weatherford, Texas to supervise the construction and relied on its in-house operations department to make the center a reality. Parts were open for the Indy Racing League event in June; the finishing touches to the radio facilities and deadline room were applied weeks before the Dickies 500, race number 8 in the Nextel Cup Chase for the Championship.

Paul Kaminski is a regular contributor to Radio World. He is news director for the Motor Sports Radio Network and contributes reports to CBS News Radio. Reach him at motorsportsradio@msrpk.com.



Texas Motor Speedway began syndication of its own weekly program "Texas Motor Speedway Total Access Presented by Chevrolet" in early 2005.

Hosted by Brad Gillie, the program originates from a separate studio at Texas Motor Speedway and is carried by flagship station KLLI(FM) of CBS in Dallas and 38 other stations in Texas and other states. Gillie's program, which covers all three of NASCAR's top divisions (Nextel Cup, Busch and Craftsman Trucks, all three of which race at TMS) and the Indy Racing League, is distributed by CD and Internet download.

Zizzo says the objective for the program was to "keep Texas Motor Speedway and racing in the minds of our fans — and our potential fans — with the syndication, as well as a possible expansion of our fan base." Hear the program at raceweekonline.com.

Gillie told RW, "I decided to spec it out like a production studio, as opposed to a broadcast studio because my show is taped every week, and not live." Here's what he uses to produce the program:

Studio:

Digidesign 002R with Pro Tools 7.1
Yamaha 01V96 mixer/control surface
Symetrix 528E mic processor
EV RE20 mics
Apple 17-inch Powerbook
Glyph 250 GB Firewire drive
Waves Gold Plug-ins
Telos One phone interface
Rane headphone amp
Sony MD deck
Furman power conditioner
Tripp Lite UPS
Dynaudio BM5A Monitors
AKG K240 Headphones
Auralex Sound Treatment

On the Road:

Digidesign Mbox 1 with Pro Tools 7.1
Apple 15-inch Powerbook
Glyph 200 GB Firewire drive
Sony MZ-B100 MD Recorder
Sennheiser MD46 microphone

A Rectifier To Fit Your Transmitter

No matter what transmitter you own, we can provide quality rectifiers from stock. We have a reliable, cost-effective solution to meet the requirements of most AM and FM transmitters built since the 1950s at prices better than the manufacturers'.

We Have CCA Rectifiers

- Rectifier Upgrades Available
- Same Day Shipments

www.rectifiers.com
800-649-6370



Don't look down

(You're standing on your competition)



More than 60% of the Top 100 highest-rated FM stations in the USA have already upgraded to Omnia-6EX—the six-band dual-path processor for standard FM and HD Radio signals. The reason these leaders choose Omnia? Once you've heard it, you'll know.

The Empire State building is pretty tall. Taipei 101? CN Tower? Even taller. But Omnia dwarfs them all. In fact, if you stacked up all the Omnia audio processors in use around the world, you'd have a tower well over 3,000 feet high.

In just a few short years, Omnia has emerged as the best-selling audio processor in the world. More importantly, it's the most successful stations in top markets like New York, Los Angeles, London, Paris, Rome, Beijing, Tokyo, Amsterdam and Berlin, that have put Omnia on top. And more broadcasters are upgrading every day, using Omnia as their secret weapon to stay miles above the competition.

Speaking of heights, did you know that Omnia processing now powers stations broadcasting from every one of the famous structures pictured above?

Big or small, isn't it high time you upgraded to Omnia?

Omnia
A Telos Company
www.omniaaudio.com

Farewell Fritts, Frist and Friends

2006 Saw Changes in Many Washington Leadership Positions That Affect Radio

A year that began with the retirement of NAB head and Washington fixture Eddie Fritts will soon end with the departure of Bill Frist, Senate majority leader, along with many of his congressional colleagues. The departures of both Fritts and Frist were planned, but most of the latter's fellow members were voted out, taking with them the Republican control of Congress.

Both of these shifts in the nation's capital could have significant impact on the broadcasting industry as 2007 dawns. In fact, the new NAB President/CEO David Rehr has already begun to make his mark, with every appearance that it's not your father's NAB anymore.

Meet the new boss ...

Although Eddie was a tough act to follow — having brought NAB from an also-ran to one of the most powerful lobbying forces on the planet over his 23-year tenure — Rehr has roared out of the box, providing much-needed vigor to the primary advocate of an industry searching for new relevance.

While the broadcast lobby remains a force to be reckoned with in D.C., the res-

onance of digital revolution echoes louder through the marble halls each year, and old voices easily can be lost. Thus it's helpful and timely to have broadcasters' concerns carried with fresh and effective expression.

Rehr's background is well known; he came not from broadcasting but from one of its biggest advertisers, the beer industry. He doesn't shy from this label but has turned his outsider nature into an asset during his early work at NAB. His speeches emphasize his own admiration of the broadcast industry, even as he learns about it. This approach highlights things that broadcasters themselves may not even notice anymore, but when they are compared to other industries, provide much to be proud of — and to take credit for.

Privately, Rehr notes that his college years did indeed include a stint on the radio, at no less prestigious a venue than KSJR(FM), Collegetown, Minn., where Garrison Keillor and "A Prairie Home Companion" also got their start. Rehr's road had no further stops in the broadcast biz, but now he'll use his considerable talents to carry the flag for U.S. broadcasters as they continue to remain vital in the dig-

ital age. If you haven't yet met or heard David Rehr speak, take your first opportunity to do so — you'll be happy you did.

Same as the old boss?

Meanwhile, the full impact of changes to the U.S. Congress is still being assessed. As committee and subcommittee leaderships and memberships are settled, broadcasters will be most closely focused on the key venues of Commerce (where the telecom reform battle will re-engage) and Judiciary (where Copyright reform discussions will continue).

But it is hard to predict how these changes will affect resulting legislation, especially on the issues of concern to broadcasters. For one thing, the slimmest of majorities exists for the Democrats — particularly in the Senate — so when it comes to final passage of bills, the 110th Congress will likely never stray far from complete parity (read "total gridlock"). The development of legislative language happens upstream at the committee level, however, where individual members can have more sway, and party leadership holds greater impact.

Yet here, too it is a tough call, since most of the issues on legislative agenda that broadcasters care about are not divided along clear party lines. They are more constituency-driven, but with today's increasingly diverse economy and demography in many U.S. regions, even this metric is not always definitive. Incoming Speaker of the House Nancy Pelosi is a case in point: She hails from California, so one might think she will be friendly to the content communities of Hollywood (movies and music) in the copyright wars, but her home district is actually in Northern California, where Silicon Valley and related electronics industry constituents might push her to the other side in that debate. Thus the layers of obfuscation run deep on handicapping the 110th Congress.

Some things never change

Of course, the 2006 election had only indirect impact in the executive branch, where the FCC lives. In fact, Kevin Martin was recently reconfirmed as chairman for the last two years of the Bush administration. It seems hard to believe he has already served as chairman for that long,

The Big Picture

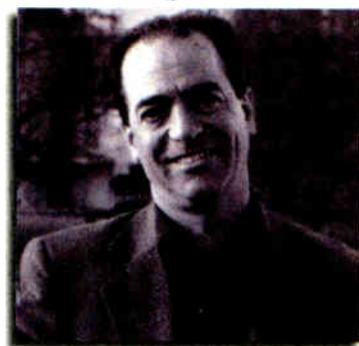


Photo: Gary Hayes, BBC

by Skip Pizzi

since not much has been accomplished — although in fairness, for much of that time the commission was not at full strength. Now it is, and its membership is arguably both as smart and diverse in its views as any in recent memory. This is a good thing, but it also means that gridlock may be hard to avoid there, as well.

Yet if Martin is to make any mark as chairman, he will need to do so in the next two years (quite likely his last chance), so perhaps we may see some improvement in commission output during this time. Martin is fairly broadcaster-friendly at heart, but non-broadcast issues have taken up most of the cycles at the FCC to date, and this is unlikely to change soon. There also seems to be a recent reluctance at the FCC to push too hard on controversial issues, given rebuffs from the courts (e.g., Broadcast Flag) and the industry (e.g., cable à la carte) that have greeted some recent initiatives. Martin is also said to be keeping a fairly tight and unilaterally authoritative rein on proceedings, a significant departure from his predecessor.

Nevertheless, he is rumored to have his sights on elected office in his home state of North Carolina following his FCC tenure, so Martin may be even more predisposed to keep broadcasters happy. For many — particularly in radio — holding the status quo may do just that. So on balance, don't look for any monumental changes on the broadcast regulatory front in the next two years.

As broadcasters contemplate the sunset of the Bush presidency and their industry's future, prospects seem complex and unclear. The players have certainly changed, but whether the outcome is any different remains to be seen.

Skip Pizzi is contributing editor of Radio World. 🌐



All in One All in Hand



UAX220-Mic

Professional USB Audio Interface For Mobile Applications



With 2/2 balanced analog high-quality I/Os and two professional grade mic preamps, the UAX220-Mic is the most efficient portable interface for broadcast and other demanding pro audio applications. Under its compact and sleek design, it combines Digigram's leading edge experience in audio performance with the ease of use of standard USB Audio.



Find out more at:
www.digigram.com/uax
www.digigram.com
input@digigram.com

Photo made in Paris, Hotel Grenobles, France, 2006. Link to Business

Turntables

► Continued from page 14

records with RCA turntables because of this very slight wow at the beginning of each record.

Presto turntables had a rubber tire around the outside of the turntable platter. A motor with a stepped shaft pressed against the tire. You changed speed by raising or lowering the motor so that a different step would contact the tire.

Fairchild turntables used a rubber belt that ran between a heavy platter and pulleys of various sizes on the motor shaft. They had low rumble but took forever to come up to speed.

The Rek-O-Kut and QRK turntables used rubber idlers between the motor shaft and the inside of the platter. They used different schemes to change speed.

RCA turntables changed speed with a planetary gear arrangement under the plat-

ter. The early models had a speed change switch that was in the platter underneath the record being played. If you started playing a record on the air by mistake at the wrong speed, you had to turn off the turntable, remove the record, change the speed and put the record back on the turntable. Changing the speed control frequently required a screwdriver to pry it, resulting in much dead air. (Been there. Done that.) Later models had the speed control on the turntable rim where it could be reached without removing the record. That speed-changer on the rim caught a lot of folks who were trying to slip-start a record and it became affectionately known as the "knuckle-cracker."

My own favorite turntable was the German-made EMT that did not come onto the American market until about 1958. They were expensive but offered low rumble, wow and flutter. They would also start instantly at the push of a button thanks to an internal slip-start mechanism. They would not play 16-inch discs. 🌐

Moseley All-Digital 4-Channel Aural STL



Moseley SL9003Q – 2- or 4-Channel STL Systems

Moseley's Starlink SL9003Q is an open architecture, all-digital aural STL without compromise. Using spectrally efficient QAM (quadrature amplitude modulation) technology, it conveys up to four linear uncompressed audio channels over a single narrow bandwidth 950 MHz STL channel. This uncompressed 16-bit linear audio is absolutely uncompromised and can be configured with up to two pairs of stereo audio (that's like getting two radio signals for the price of one). AES/EBU I/O, combined with a sample rate converter, provide seamless connection without delay. Selectable digital audio sampling rates of 32, 44.1 or 48 kHz. Call BSW for the industry's lowest prices on Moseley STLs today.

SL9003Q-2S	1 stereo pair 44.1 kHz audio sampling 16 QAM modulation	List \$12,950.00
SL9003Q-4S	2 stereo pairs 32 kHz audio sampling 32 QAM modulation (on request two 44.1 kHz stereo pairs at 128 QAM can be special ordered)	List \$16,250.00
SL9003Q-2SLAN	1 stereo pair 44.1 kHz, UDP Mux for HD Radio, 32 QAM mod.	List \$15,450.00
SL9003Q-4SLAN	2 stereo pair 32 kHz, UDP Mux for HD Radio, 64 QAM modulation	List \$18,750.00

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



12 Affordable Channels: XLR and 1/4" Connections

Broadcast Tools ProMix 12 Console



Trust Broadcast Tools for the highest quality products at the lowest prices! The new ProMix12 is a full-featured audio mixing console ideally suited for the typical broadcast studio or any similar application. It features inputs for three microphones and nine stereo line sources, two stereo mixing buses, a "mix-minus" output, a mono output, and comprehensive cue and monitoring systems. Other functions include an announce booth output with full duplex talkback, accurate audio level metering, remote control of microphone channels and remote-start facilities on all line input channels. Get in on this introductory offer by pre-ordering today. Call your sales rep for more details.

PROMIX12 List \$1,599.00

LowestPrice only \$1,299!



Bird Broadcast Power Monitor

Expand your options for measuring, monitoring and protecting your RF transmission systems with the new BPME. From remote power/VSWR monitoring via a user-friendly web interface to never-before available data logging capabilities, the BPME gives you an unmatched range of functions designed to make your job easier while protecting the health of your investment. Put complete analog and digital broadcast monitoring at your fingertips through user-friendly, around-the-clock, remote access from any web-enabled device. Detect problems and deal with them quickly and easily before they escalate into more costly situations. The BPM-E1 is for 1-5/8" line. Other models available.

BPME1 List \$3,190.00

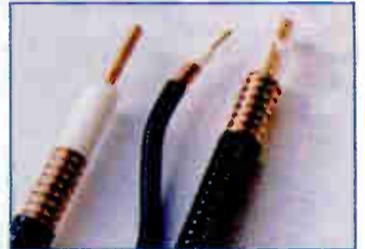


Add the Bird 3129 Broadcast Power Monitor Display Meter to accurately measure power in digitally modulated and multi-carrier systems, including the BPME. It effortlessly calculates VSWR, return loss, and match efficiency using hardware or PC-based software displays.

3129 List \$1,100.00

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

Get Expert Advice at BSW



Andrew HELIAX Cable Products

BSW represents a complete Andrew line of products for all your transmission cabling requirements including HELIAX foam and air-dielectric cable connectors and accessories, rigid transmission line, pressurization and accessories.

Andrew HELIAX coaxial cable and connectors are designed to provide optimum electrical performance for a wide range of RF applications. You can be certain that HELIAX coaxial cable systems will perform as you expect with no surprises.

Call BSW for all your Andrew needs!

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

Protect From Lightning Strikes

PowerClamp Transient Voltage Surge Suppression



PowerClamp Transient Voltage Surge Suppressors provide the ultimate protection against massive high energy surges, spikes, noise and distortion on the AC powerline. Call for BSW with your requirements TODAY.

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

Kathrein-Scala PR950 STL Paraflector Antenna



Used for point-to-point STL links, telemetry, and UHF-TV, the Kathrein-Scala PR Series Paraflector offers rugged construction for long-term service. A universal mounting bracket allows for easy horizontal or vertical mounting. Specify frequency when ordering. Type N connector.

PR950 List \$767.00

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



Ho, Ho, Ho. Happy Holidays from all of us at BSW... now go buy some of this stuff and put it under the tree in the lobby.

Electro-Voice RE20 Dynamic Mic

Do we really have to sell you on the RE20? A favorite of broadcasters and engineers worldwide, it's simply built to last forever. Its patented, Variable-D design reduces proximity effect to maintain uniform low frequency response at any distance (thereby eliminating bass-boosting when close miking) and its bass roll-off switch helps to shape low-end response. An internal element shockmount reduces vibration-induced noise.

RE20 List \$798.00

LowestPrice only \$399!

The Electro-Voice 309/A is the suspension shockmount.

309A

LowestPrice only \$99!

The Ultimate Pop Filter for the RE20

The BSW RePop is the ultimate pop filter for the RE20. The fine mesh metal screen diminishes undesirable P-Popping while keeping the integrity of the hi-end frequency

response. The RePop clamps easily and securely to the microphone and will work in conjunction with the EV 309 shockmount. Robust metal construction. **REPOP**



LowestPrice only \$39⁹⁵!

Lowest Prices on everything at: www.bswusa.com

Same Day Shipping

B/W stocks in large warehouse of products. If we have it in stock, we'll ship it the same day. Just order by 7:00 PM Eastern Time.

Free Shipping on Most Web orders over \$189

Most web orders over \$189 get FREE ground service delivery to the continental US only. Excludes heavy or irregular items.



1-800-426-8434

World Radio History

Knowledgeable Staff

Over 30 years professional broadcast and audio experience. We're experts with your equipment purchase. RW 12/2006

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

HD Radio Car Converters Revealed

Some HD-R car converters reaching stores this month were unveiled in the fall at an aftermarket auto show — a first peek at plug-in devices that allow consumers to receive HD Radio with their current in-dash radios

Ibiquity had displayed one such product, a Dice Electronics HD-R converter, to broadcasters for a limited time in its suite at the NAB Radio Show in the spring. But HD Radio products were displayed in 14 booths at the show for the Specialty Equipment Market Association, which represents the automotive specialty and performance parts industry. SEMA ran Oct. 30–Nov.3 in Las Vegas.



Photos by Mike Bergman

Trucks and other demo vehicles line in front of the Las Vegas Convention Center.

Some of the featured HD Radio products were car connectivity units demonstrated live through Toyota, Honda, General Motors and Ford factory head units, as well as plug-in devices from Dice and Directed Electronics.

HD-R systems from Kenwood and JVC were featured and Visteon displayed HD Jump, a new dockable mobile/home system.

RadioShack HD-R Leads 'Black Friday' Bargains

RadioShack dropped the price of its Accurian HD Radio for three days to \$99, after a mail-in-rebate to



HD Radio products were displayed in 14 booths at the show for the Specialty Equipment Market Association.



The HD Jump from Visteon can be docked both in the car and at home. The unit is compatible with in-dash head-units from most manufacturers.

kick off the holiday shopping on so-called "Black Friday," the day after Thanksgiving. The radio is available at about 2,400 RadioShacks and online.

The list price is \$199, although the company is also dropping the cost to \$174.99 for those who submit a qualifying mail-in rebate through Jan. 14, 2007.

New Products Coming; Where to Buy

New HD Radio receiver products were set to hit retailers' shelves just in time for holiday gift-giving. In addition to Cambridge SoundWorks' new tabletop and component models, new units include the Sangean HDR-1 and HDT-1 HD; Radiosophy Multistream; Onyko and Denon units; and Kenwood's automotive HD Radio converter.

New automotive converters, both plug-in and dockable units, can enable nearly any automotive receiver — including satellite radio — to decode HD-R signals.

Converters will be in retailers, car dealerships and dealer groups by Q1 2007. Directed, Dice, Metra, AAMP/Peripheral and Visteon manufacturer the devices.

Directed Electronics Plans December HD-R Shipments

Directed Electronics plans to ship HD Radio receivers to broadcast customers at reduced prices this month.

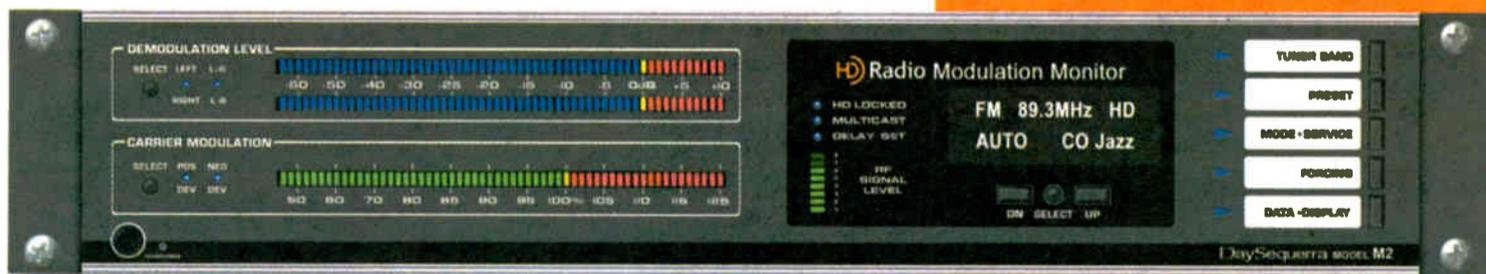
The company said it would ship the Directed HD Car Connect (DMHD-1000) and the Directed HD Table Top (DHHD-1000) to broadcasters in December for promotional giveaways, and to its retailers this spring. Ibiquity is making the units available to broadcasters at \$99 plus shipping.

Visteon Demos Dockable HD-R Device

The HD Jump from Visteon is the first IBOC receiver that can be docked both in the car and at home, according to the company.

A spokeswoman told Radio World the Jump is compatible with in-dash head-units from nearly all manufacturers. Target availability is mid-January at Visteon aftermarket distributors and dealers. Price has not been determined.

M2 HD Radio Modulation Monitor



- AM-FM AND HD RADIO™ MULTICAST MODULATION MONITOR IN 2RU SPACE
- INTUITIVE, EASY-TO-USE FRONT PANEL INTERFACE - GET YOUR STATIONS STATUS AT A GLANCE!
- BRIGHT, ACCURATE LEVEL METERS AND FULL-FEATURED DATA DISPLAY
- ANALOG SCA LEVEL (M2.1) AND ETHERNET REMOTE CONTROL-ALARM-LOGGING (M2.2) OPTIONS

Designed and Manufactured in the USA

DaySequerra

For all the facts, visit www.daysequerra.com or call 856-719-9900

Superior HD Radio is a Thing of the Past. And Present. And Future.



No HD Radio system outperforms the combination of BE FXi HD+FM Exciters and FMi transmitters. Essential Spectral Precorrection™ (ESP) is integrated system-wide for unprecedented spectral integrity. And no FXi owner has paid to replace his exciter because the original FXi continues to meet the demands of multicasting and updated HD Radio architectures. We got it right from the start. That's Total Radio. Guaranteed.

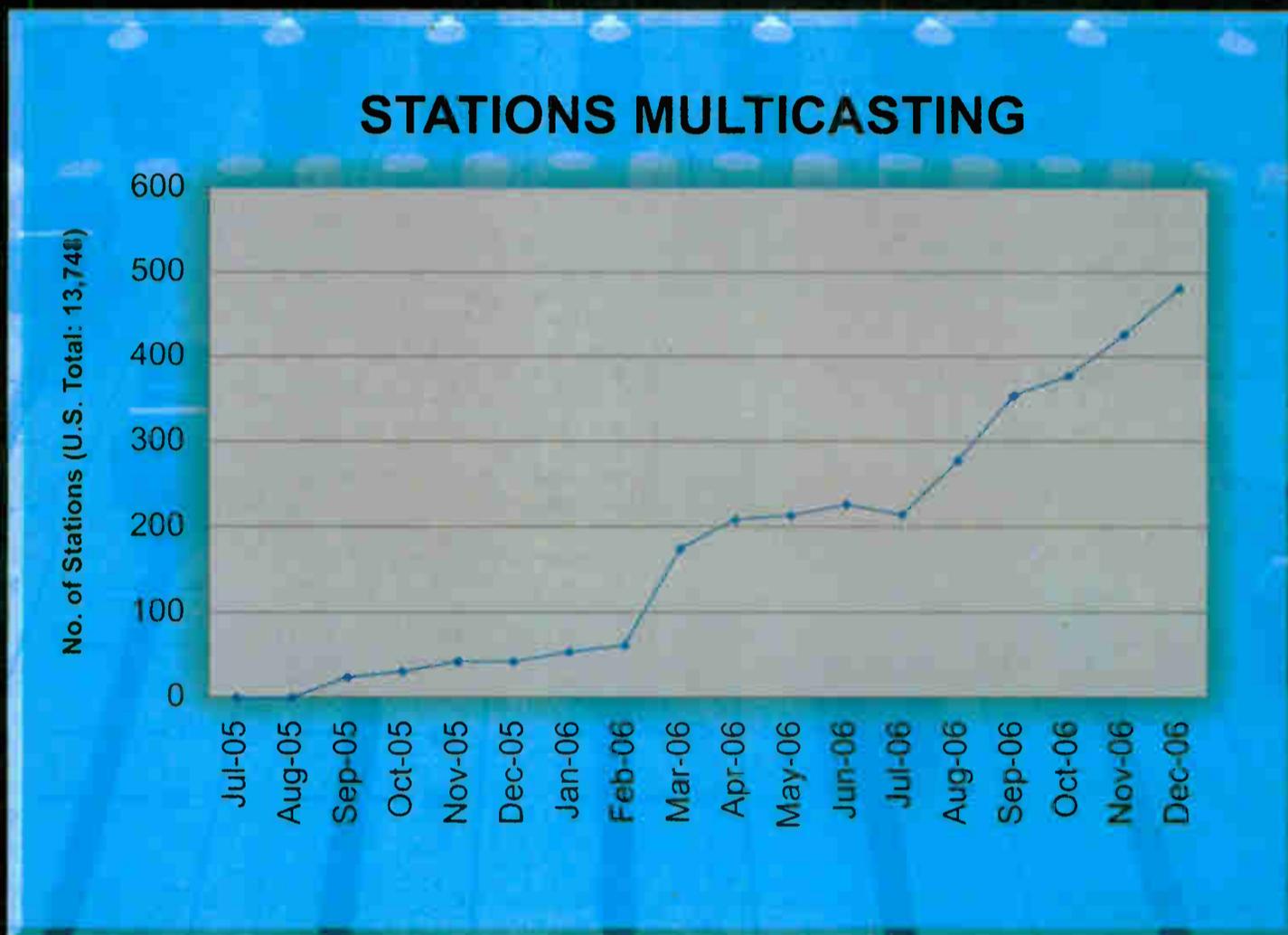
Broadcast Electronics Inc
Tel: (217) 224-9600 • Web: www.bdcast.com • E-Mail: bdcast@bdcast.com



Radio World's HD Radio™ Scoreboard

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

STATIONS MULTICASTING



The HD Radio Bottom Line
Total Licensed On the Air

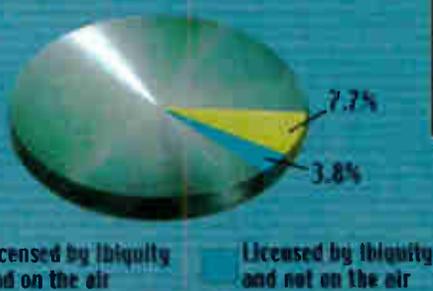
1,579 1,052

Last Month
Total Licensed On the Air

1,530 1,015

Market Penetration
United States

13,748 AM & FM Stations
(excludes LPFMs)



Number of
FM Stations
Multicasting:

482

Last Month

427

WHUR, WAMU Unveil Multicast Channels

by Leslie Stimson

WASHINGTON Hundreds of radio stations have launched supplemental digital channels. Here's how two FMs in Washington — WHUR and WAMU — are approaching the project. Both say they are working to keep costs low while providing innovative programming.

WHUR-World offers a mix of music and information intended to expand the way people look at the world, according to its programmers. The HD2 channel is programmed in conjunction with the School of Communications for Howard University, the station licensee. WHUR was the first commercial station in Washington to go IBOC in 2004.

The new channel allows WHUR and Howard to collaborate on programming. Students gain real-world radio experience by working on the channel and the HD2 station serves as a farm team for WHUR.

WHUR GM Jim Watkins said, "We've been planning this since we went HD. One of the things we always wanted to do was own another radio station, but that wasn't in the cards for us. Now, we have another station and it gives us the opportunity to do things with the university, which most stations owned by colleges do."

Resources

Though WHUR is licensed to Howard, it is a professional commercial station. The HD2 channel has a staff of seven, some of whom share duties with WHUR; others are students with experience from



WHUR-World Programmer Justin Thwaites and WHUR GM Jim Watkins in the new HD2 studio.

Howard University's student station, WHBC(AM).

Sean Plater, general manager of WHBC, said the HD2 channel "will touch the world. Current students and those to come will benefit," from the experience.

The cost of the new channel project was roughly \$43,000. The largest expense was a digital encoder; the Harris model chosen for the job cost about \$19,000. WHUR's Broadcast Electronics AudioVault system was expanded to one

terabyte of storage to allow enough storage space for the music libraries of WHUR, the HD2 channel and enough to grow, according to Watkins. The cost of that was rolled into a digital facilities upgrade last year.

The programming for both digital channels is uncompressed and the bit rates for both the main and supplemental digital channels are 48 kilobits per second.

Wheatstone provided a routing system and console furniture for two edit rooms containing ProTools; the gear in the rooms cost about \$12,000 each. Neumann dynamic mics were used.

The content will be delivered by CD and ripped into AudioVault. The routing system allows an HD2 programmer to pick up any input in either the WHUR or the campus station. Using dedicated ISDN lines for master control, the HD2 programmer can receive an audio source.

The HD2 studio is also set up to record interviews.

"We tried to make it (the studio) as self sufficient as we possibly could," said Watkins, so the HD2 channel doesn't affect the work on WHUR and vice-versa.

Some programming will be voice-tracked; the station can be automated or run in a manual mode.

"We are not trying to run a live show in each daypart, because in WHUR-World,

there is no daypart. We make the rules," said Watkins, who added the HD2 channel is not trying to compete with the main channel, but offer an alternative.

The HD2 format is a jazz-intensive blend of classic jazz, rhythm and blues, gospel, blues, hip hop, African-American folk and world music.

WHUR has been giving away Boston Acoustics Receptor HD Radios to promote the launch of the HD2 channel.

Triple A

WAMU is a professional noncom licensed to American University. It launched its second supplemental channel in collaboration with Towson University station WTMD.

WAMU is broadcasting the adult album alternative on WAMU 88.5 Channel 2, its second digital channel. WAMU now airs "Bluegrass Country" on its HD3 channel.

WAMU and WTMD are co-promoting the Baltimore-Washington connection during their legal IDs and other on-air identifiers. WAMU calls the collaboration with publicly funded WTMD "unprecedented."

WAMU Spokeswoman Kay Summers said the station wanted to use the AAA format for the additional supplemental to fulfill an unserved audience. The collaboration with Towson is important, she said, because Baltimore and Washington are increasingly becoming one large market rather than two separate smaller entities as the population of the area grows.

Participants say the partnership also represents one of the first examples of sharing resources for digital radio within the public radio system.

WTMD is sending its signal to WAMU as an MP3 stream. WAMU decodes the stream and sends the decoded stereo audio to its transmitter for broadcast, according to Director of Engineering John Holt.

WAMU was using an Internet DSL connection for the WTMD signal at press time, but was looking at getting a connection with more bandwidth.

When asked about the cost of the project, WAMU officials said they used existing hardware and infrastructure for the new supplemental channel and did not incur additional costs. The data throughput rate for the main digital channel is 48 kilobits per second, with 32 kbps for the WTMD channel and 24 kbps for the bluegrass HD3 channel.

The new stations for both WHUR and WAMU are broadcast digitally as well as streamed on the Web. See www.whur-world.com and www.wtmd.org, which is linked from www.wamu.org.

BE Gives Away HD Radios

Greg Manfroi, chief engineer of non-com FM stations WUIS and WIPA in Springfield, Ill., was one of the winners in a drawing for HD Radios from Broadcast Electronics.

Winner names are drawn from those who responded to BE's customer satisfaction survey at www.bdcast.com. Manfroi is shown above with his new Boston Acoustics Receptor Radio HD.

Also winning in October was John Harper, president of WMEL(AM), Melbourne, Fla., who won a Polk Audio I-Sonic Entertainment System with HD Radio.



ALTRONIC RESEARCH INC.
Performance By Design



OUTDOOR DUMMY LOADS
6600 Series

Convection-Cooled Resistor Loads
Designed for Outdoor Applications

Available in 6kW, 12kW & 20kW Power Ratings
Ideal for HD Applications
No AC Power Required



ALTRONIC RESEARCH INC.

P.O. Box 249 Yellville, Arkansas 72687 870-449-4093 Fax: 870-449-6000
E-mail: altronic@mtnhome.com Web Site: <http://www.altronic.com>

HARRIS®

Harris is your end-to-end radio solution provider.

AM/FM Analogue • HD Radio™ • DAB or DRM • Audio Consoles

Broadcast Studios • High Power AM • Systems and Service • Intraplex Transport

HD Radio™ is a trademark of iBiquity Digital Corporation

Harris PR&E NetWave console with optional networking.
Available in 8-16-24 channel frames, all with fully modular construction.



FlexStar HDx exciter—the gold-standard for FM and FM-HD exciters, featuring RTAC (Real Time Adaptive Correction for best mask compliance) and Engine, the latest iBiquity platform in HD Radio.

Imagine Harris transmitters...

combined with legendary Orban audio processing.



Featuring *versatile* five-band and two-band processing for both analogue FM transmission and digital radio, the 8500 provides the industry's most *consistent* sound, allowing you to create a sonic signature for your station with the assurance that your signature will stay locked in, uniquely branding your sound.

Stereo enhancement • Equalization • AGC • Multiband compression • Low-IM peak limiting • Stereo encoding • Composite limiting

HARRIS®

assuredcommunications™

Government Systems • RF Comm • Broadcast • Microwave

Contact Harris at 800-622-0022 or email broadcastsales@harris.com

www.harris.com



www.orban.com

Studio Sessions

Product Guide



Inside

Radio World

Resource for Radio On-Air, Production and Recording

December 20, 2006

A Store-and-Replay Future?

Speakers at AES Panel Look Ahead at Digital Radio and Consumer Behavior

by Ty Ford

SAN FRANCISCO More than 17,000 audio professionals and enthusiasts gathered in San Francisco this fall at the Moscone Center for the 121st Audio Engineers Society Convention.

Attendance was up 8 percent from the previous San Francisco show two years ago.

While there were too many attractions, exhibits and tours for any one person to absorb, the "Innovations in Digital

Radio" session chaired by David Bialik of DKB Broadcast Associates in New York was among the more interesting to radio broadcasters.

David Layer of NAB, Mike Lyons of Ibiqity Digital Radio and Jan Andrews of NPR Labs. For those who have been hovering over the twists and turns of IBOC for years, the presentation might have seemed anti-climactic. The presenters did, however, lay out their views of obstacles on the landscape and offered possible solutions.

Wilson, CEA's engineering and standards director, pointed



Skip Pizzi, Radio World/Microsoft; Chris Crump, Comrex Corp.; Art Constantine, APT; Herb Squire, DSI RF Systems Inc.; Bob Band, Harris; and Rolf Taylor, Telos Systems (from left).

Radio's future depends on technology that allows radios to store and replay content in a consumer-friendly manner.

— Dave Wilson, CEA

to problems in the recording industry business model. According to Wilson, although album sales have dropped precipitously, sales of singles from iTunes and other single copy downloads are up — way up. "The message is clear," he said. "People want to buy and listen to

the songs they want, not all of the songs on a CD. In addition, iPods and other players allow consumers to store all of their music on one device and listen to it when and how they want."

According to Wilson, "What the record industry has to come to terms with is that today's technology allows it to be circumvented and abandoned by both consumers and producers of music. Producers of music no longer need record companies to distribute their creations — they can publish directly to the Internet, and of course consumers can easily download what they want from the Internet. Instead of fighting against technology and trying to prevent consumers from doing what they want, the record

industry should be embracing technology and aiming to satisfy the huge consumer demand for content that can be easily obtained and copied from device to device.

"Everything is evolving," Wilson said. "Radio has evolved from AM to FM to satellite to IBOC digital radio. Consumer electronics have evolved from record players to cassette tapes to CDs to MP3s. The record industry needs to evolve, too. Its traditional business model creates consumer confusion and unhappiness in today's world."

Wilson said, "After purchasing music consumers want to be able to choose the device on which they listen to it, and they want to be able to transfer the music from device to device when they upgrade to new hardware, move from home to car, etc. And they want to be able to record content from the radio. They've been able to do this for decades, and modern technology has made it even more desirable because radios can easily be designed to store the latest news, traffic and weather reports, and music. Sirius and XM have been working to satisfy this consumer demand with new products that can store content, and they've already been attacked by the music industry."

Wilson responded to the argument that the music industry cannot compete against "free content" via downloads: "You can compete with 'free.' There are 13,748 AM and FM broadcasters in the U.S. and AM/FM broadcasting is a \$20 billion a year business."

He suggested that the recording industry look at the business models developed by Yahoo and Google, noting that those two services, alone, generated \$11 billion in advertising revenue in 2005, just shy of the \$12 billion in sales of recorded music — and Yahoo and Google give their content away for free. He said, "the recording industry should be able to develop an advertising-based business model that gives consumers what they want."

"Radio's future depends on technology that allows radios to store and replay content in a consumer-friendly manner," said Wilson. "Consumers today want personalized content, and to get this from radio they need devices that can store the content they want, and ignore the content they don't. IBOC can easily provide this capability."

The big push
From the NAB Science and Technology Department, Director of Advanced Engineering David Layer segued into his presentation by recalling a graphic illustration shown at the most recent NAB Radio Show: a fictional device comprising a radio, an iPod and a computer. He said the NAB's slogan "A Digital Radio in Every Device" is part of an effort to make manufacturers and users move towards having a multicasting-capable digital radio in cell phones,

See AES, page 27 ▶

Happy Birthday Radio!



In 1906, Reginald Fessenden became the first person to broadcast words and music over radio waves

Radio grew up
with
JENNINGS inside

Since 1942, the Jennings vacuum capacitor has been renowned as the **standard** choice for transmitters worldwide.

Tell us about your favorite radio history fact and you will automatically be registered to win a Vintage Radio. Visit us at www.jenningstech.com.

MOST WANTED

The world's best on-air microphone - period.



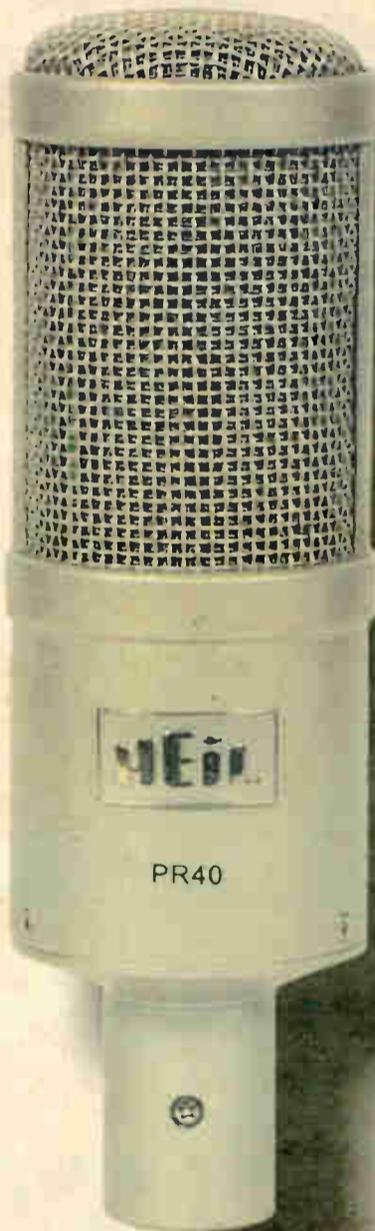
"The PR40 makes me sound fabulous. I absolutely love this microphone. We replaced our old microphones, which by the way were considered to be the industry standard, and the difference is like night and day."

**- DUSTY STREET
FREED RADIO STUDIO
ROCK AND ROLL HALL OF FAME
SIRUS SATELLITE RADIO**



"I am not the most technical guy in the business, but after 32-years in the broadcast business, I know microphones. I plugged in the PR 40 straight into the board without any processing and it absolutely blew me away. Without a doubt the PR40 is the best broadcast microphone ever developed."

**- MIKE MCKAY
BRAVO MIC COMMUNICATIONS
KVLG 101-GOLD FM
KXPZ ROCKET 99.5FM**



"This mic is unbelievable. I have worked with some of the most expensive microphones in the broadcast industry and none, I mean NONE compare to the PR 40. I have received reports from stations all over the world about the amazing audio quality of this mic."

**- GREG HEMMINGS
WSLS-TV NEWSCHANNEL 10**



"The Heil PR 40 is incredible. There is absolutely nothing better on the market and I've had the opportunity to use all the standards over the years. The difference is really remarkable."

**- PD MICHAEL "SHARK" SHARKEY
WSUN FM 97X
COX RADIO TAMPA BAY**



Heil Sound Ltd.
www.heilsound.com
info@heilsound.com
618.257.3000

PRODUCT EVALUATION

Acoustic Wave II Gives Good Bass

Bose Updates the Compact System With New Digital Signal Processing Technology Applied to Waveguide

by Frank Beacham

In the modern history of consumer radio receivers, few products have had the sustained commercial success of Bose Corp.'s Acoustic Wave compact audio systems.

The first Acoustic Wave system, developed by Dr. Amar G. Bose, was introduced in 1984. Since then, products based on his waveguide technology have become icons representing premium quality radio listening.

In September, Bose updated the flagship of its line with the new Acoustic Wave Music System II. What began more than two decades ago as a very good sounding AM-FM receiver has morphed into a digitally enhanced subcompact home music system with remarkable sound quality.

Don't call it a boombox

Bose unveiled the Acoustic Wave II from behind a black curtain at a New York City press event this summer. Playing music at live performance levels, it was difficult to believe such big — yet subtle — sound could come out of such a small box.

This is a tried and true illusion for the product promoters at Bose, which says it has repeatedly seen people do double-takes when they first hear waveguide technology at work. One does not expect a 14.5-pound portable — it's insulting to call it a "boombox" — to sound like this.

The key to the latest Acoustic Wave improvement is new digital signal processing technology applied to Bose's 80-inch waveguide, which is folded back and forth inside the one-piece cabinet. The result is a rich, natural sound with honest, unexaggerated bass.

As a quick refresher, Dr. Bose created acoustic wave technology while trying to solve the longstanding problem of

how to create deep bass sound from a small device with minimal space.

As he pondered the problem, he considered the flute, a tiny instrument that strengthens a breath of air to fill a concert hall with sound. Playing with that concept, Bose mathematically matched a speaker driver to the characteristics of a long, winding tube in such a way that vibrations of the speaker cone were amplified.

Though refinement of this technique, he produced deep bass from a small box. It led to development of waveguide technology, a major breakthrough in the quality of small home sound systems.

In the latest-generation systems, including both the Acoustic Wave II and the smaller Wave Music System, digital signal processing replaces analog circuits to improve performance at high

volume levels and to enhance low frequencies.

The new Acoustic Wave II includes a digital FM/AM tuner with pre-sets. It delivered solid, clear reception with the included FM dipole antenna in the heart of New York City, a tough place for clean radio reception. A new talk radio mode, which I found effective, compensates for the artificially boosted low frequencies found in some talk radio shows.

The new model can handle MP3 as well as standard CDs, and includes an input jack for external sources and a Bose link connector for interface with other Bose products. When MP3 CDs are encoded properly, a visual display shows the track, title and artist. A small, credit-card-size remote control is included.

The new optional iPod connection kit includes a dock that connects via a single cable to the Acoustic Wave II and a remote control that combines the operation of the music system and iPod into the same interface. The kit, priced at \$129, makes an elegant integration of the two devices.

The Acoustic Wave II is about 10 x 18 x 7 inches. Molded inset handles



Product Capsule:

Bose Acoustic Wave II Compact Audio System

Thumbs Up

- ✓ Sublime sound
- ✓ Ease of use
- ✓ FM/AM tuner with clear reception

Thumbs Down

- ✓ No tone controls

PRICE: \$1,079

CONTACT: Bose at (800) WWW-BOSE (999-2673) or visit www.bose.com.

make it easy to lift and move, while AC or 12-volt DC powering allows it work anywhere. You can outfit the box with an optional 5-CD changer, battery pack and travel case.

Bose has always had a knack for bringing unusual simplicity to audio systems. This often frustrates audiophiles and geeks who want to see specs that Bose never provides for its products. For this reason, the company sometimes gets a bad rap.

I'm in the opposite camp on this issue. I covet simplicity in electronic devices and sometimes find car radios so complex I need an operating manual to tune in a station. The Luddite in me loves Bose; ease of use is why I find Bose products such a joy to use.

As anticipated from past experience, I found the Acoustic Wave II a case of intelligent design, superb build quality and intuitive operational simplicity. And the sound is sublime.

All controls are basic. Tone controls are absent. The only way to "tweak" the sound is by physical placement of the unit in different positions throughout the listening environment. The user can do virtually everything easily with the remote control.

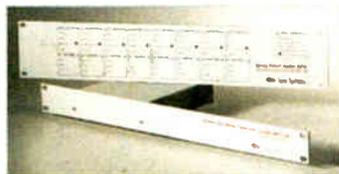
After spending about a week with the new Acoustic Wave II, I can say without hesitation that it is the best-sounding compact bookshelf music system I've experienced. You cannot buy a better FM-AM compact sound system.

Frank Beacham is a writer and media producer living in New York.

Control Solutions

Model RFC-1/B Remote Facilities Controller

- control transmitter from any telephone
- 8-64 channels of telemetry and control
- programmable control by date and time
- optional printer and modem adapters
- programmable telemetry alarms
- integrated rack panel



Model RAK-1 Intelligent Rack Adapter

- parallel printer interface
- internal modem for data transfer
- front panel status indicators
- battery backed power supply
- rack mountable chassis
- accessory package for RFC-1/B



Sine Systems, Inc.

615.228.3500

more information: www.sinesystems.com

WE GIVE YOU DUBÉ

Name: Charles Dubé

Writes about: Radio products and technology.

Experience: CE at WFCR(FM), Amherst, Mass. Former chief or assistant chief engineer at Connecticut and Massachusetts stations such as WWUH(FM), WDRG(AM/FM), WTIC(AM/FM).

Certifications and Industry Honors: Certified Broadcast Radio Engineer

Mentors/heroes: Over the years I've been fortunate enough to work with and learn from great people such as John Ramsey (Marlin), Tom Ray (WOR) and Jeff Hugabone and Gene Faltus at CBS.

Quote to live by: "One's destination is never a place but rather a new way of looking at things." — Henry Miller



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

Radio World

AES

► Continued from page 24
computers, iPods and PDAs.

For Mike Lyons, vice president of after-market business development for Ibiqity Digital, the take-away message is clear: HD Radio is happening. Lyons said that 1,000 stations are on the air with HD Radio and roughly 380 were multicasting. "Twenty-one stations in New York are broadcasting digitally, 12 with secondary channels. Seventy-eight percent of the total radio market in the U.S. is being reached by an HD signal. HD Radio also is on the air in France, Switzerland and Brazil." [The number of stations multicasting has continued to grow since; see HD Radio Scoreboard, page 21.]

Lyons said 2,000 stations have equipment on order for implementing HD Radio over the next 18 months. From the automotive industry, 49 car models will include HD Radio in the next three years. He also expects a big push for receiver sales this holiday season with features such as multicasting and surround.

Jan Andrews is Senior Engineer of NPR Labs, which representing 300 member stations comprised of 800 transmitters in 50 states, including repeaters, translators and semi-independent stations. He reports that under the banner of "Tomorrow Radio," NPR has encouraged its refinement of and field-tested HD Radio with Harris. "One-hundred sixty-five transmitters have converted, 40 are now multicasting and 400 transmitters are committed to converting to HD Radio this year."

Andrews said that, while not flawless, the system's codecs sound good at realistic bit rates of 48 kbps and higher. "We'd like more than 96 kbps. We'd like enhanced modes," he said. "We are testing the first extension to 120 kbps and, although not as robust as the 96 kbps, several of our stations are now transmitting the higher bit rate successfully." Listing NPR's hopes and aspirations, Andrews wants a wider selection of less-expensive receivers and better low-bit-rate encoders.

In addition to hardware and software, Andrews says NPR is investing in people. "In 2005, we established NPR Labs," he said. "John Keene and Ellen Sheffield are new to NPR Labs. John is a radio rocket scientist and Ellen Sheffield is a cognitive psychologist who is ruthless about methodologies."

"We know that some stations are doing better than others. We need to know more about why," he continued. "The FCC database of HD Radio information has a lot of holes and not much detail in how stations are built. We need to know more." Andrews envisions HD Radio offering information for both the sight- and hearing-impaired: "Why not have portable radios with rich text/graphic displays for the deaf, reading services for the blind, text-to-speech and multilingual programming, PSD graphic content, conditional access for subscription-based programming, even traffic reports?"

Ty Ford is a frequent contributor to Radio World. Reach him at www.tyford.com.

got tools?
cables & connectors
racks
tools
problem solvers
test gear
& much more
www.systemsstore.com

PRODUCT GUIDE

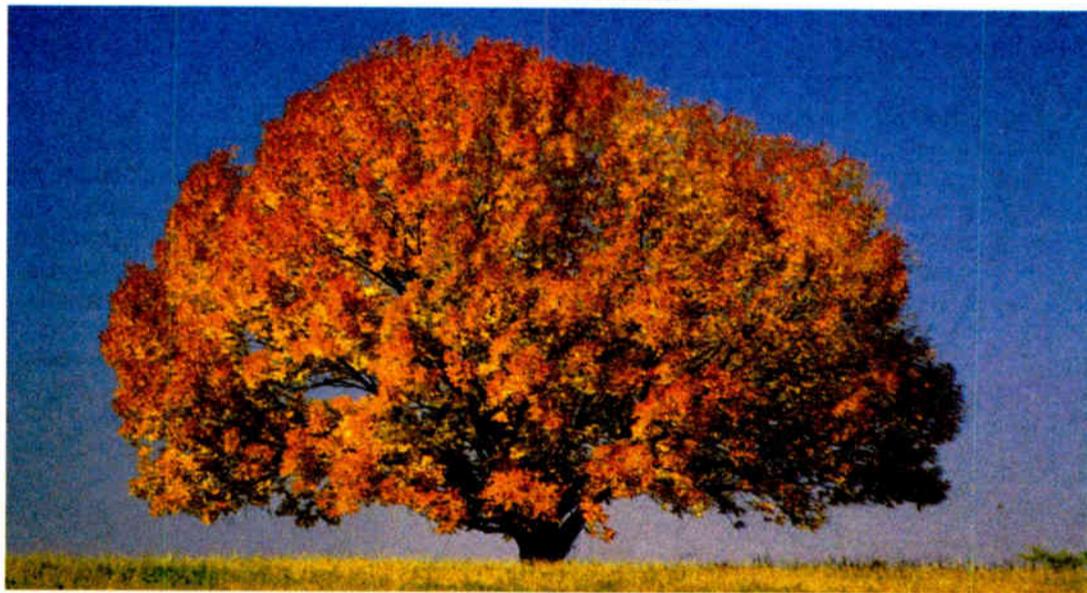
Audioarts IOC-16 Links D-75N, NET Router

The Audioarts NET router is a high-speed central switch that links multiple studios with a technical operations center. Each of its eight links handles 64 secure bi-directional data paths with embedded control signals, allowing users to centralize shared audio resources and wiring in the TOC and integrate eight separate D-75N digital audio consoles as a working network, with each console's studio location handling both networked signals as well as hardwired local sources.

The NET router operates autonomously with no external PC required other than for initial setup and source naming.

The IOC-16 audio input/output center acts as a networked intermediate link between the D-75N digital audio console and the central NET router. It may be located in the TOC center or in the local studio. It accepts local hardwired digital and/or analog input signals and outputs them in analog and digital formats, where they can be shared with a connected D-75N console and/or NET router.

For more information, contact Wheatstone Corp. in North Carolina at (252) 638-7000 or visit www.wheatstone.com.



In times of change....

Our commitment stands firm.

With all the news and hoopla over dMarc lately, the news striking home was no doubt our strong commitment to leadership in station automation technology. Not only is that commitment as strong as ever, but it's growing ever stronger.

dMarc spends more money on R&D perfecting our industry-leading digital automation systems than do all the other automation companies combined. For our client stations, that means true peace of mind knowing that not only do you have the best digital solutions in the industry, but the inside track to even better technology in the future.

The best digital systems.
The best broadcasting solutions.
The best service

ALL FROM DMARC. STILL.

1-888-438-7268
www.dMarc.net

SS32 Maestro

19540 Jamboree Road, 2nd Floor, Irvine, CA 92612

Google™

End-to-End Solutions From SCMS

Orban 8500 FM Digital Audio Processor

Get your RACK Solutions from the
Dealer That Knows Radio.



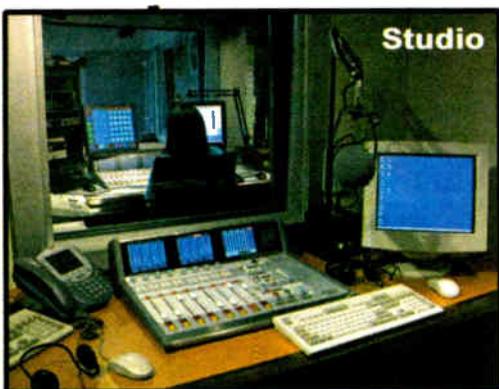
Introducing Optimod-FM 8500:
Orban's new flagship processor and the next step beyond the Optimod-FM 8400. The 8500 builds on the proven, competitive sound of 8400 version 3 while adding features that make it the ideal choice for FM stations

simultaneously transmitting iBiquity's HD Radio®, Eureka 147, or a netcast. We doubled the DSP power, so the DSP not only supports the new features but also provides comfortable headroom for future DSP improvements.

The 8500 provides stereo enhancement, equalization, AGC, multiband compression, low-IM peak limiting, stereo encoding, and composite limiting—everything that even the most competitive major market station needs to stand out on the dial.

More than 20 excellent sounding, format specific factory presets get you started. You can customize them with easy one-knob LESS-MORE control or with more than 60 advanced controls, whose versatility will satisfy even the most finicky on-air sound designer.

Processing for digital radio/netcast (DR) is now supplied standard. We increased the base sample rate of all processing to 64 kHz. A built-in 8-second delay in the analog processing path vastly improves installation versatility in HD Radio plants. This allows you to use the 8500's built-in stereo encoder and composite limiter to drive the analog FM transmitter, ensuring no-compromise analog-channel loudness.



Contact SCMS
at any of its offices
to discuss your needs.

1-800-438-6040

Bob, Ernie, Matt or Mike
HQ in Pineville, NC

Mid-South: 1-877-391-2650 Bob Mayben
Central: 1-731-695-1714 Bernie O'Brien
West Coast: 1-866-673-9267 Doug Tharp
Mid-West: 1-513-899-3036 Mary Schnelle
South-Atlantic: 1-770-632-1295 Art White
North-East: 1-315-623-7655 Jim Peck
South-West: 1-877-699-9151 Tyler Callis
Pro Audio: 1-877-640-8205 Ric Goldstein



www.SCMSinc.com

Buyer's Guide

Tech
Updates
Inside



Radio World

Antennas, STL, Transmission Support & Power Protection

December 20, 2006

USER REPORT

DCBR Maintains Coverage, Transmits HD

WFAE Picks Dielectric's Antenna for Reduced Weight/Wind Load, Configurable Dual-Input Design

by Jobie Sprinkle
Director of Engineering/IT
WFAE(FM)

CHARLOTTE, N.C. The Charlotte, N.C., metropolitan area has been booming for several years, thanks in large part to people moving here for jobs at the headquarters of some of the world's largest banking institutions. Back in the early 2000s, that was great news for Charlotte's economy but created a problem for the radio station where I work as director of engineering/IT.

My station is WFAE(FM), the NPR news and information affiliate for the Charlotte region and surrounding area. For years, WFAE utilized a directional analog antenna side-mounted on a large-face tower. As with many antennas that share this configuration, there were compromises in the coverage area. This of course was exactly the area to which many of Charlotte's new residents were relocating.

For years as WFAE consulting/contract engineer I had fielded complaints about this poor coverage. When I joined the station full-time in 2000, I kicked off the plan to fix it.

Finally after several years awaiting FCC approval, Consulting Engineer Tim Warner and I made plans for a trip to NAB2004. We hit the show floor armed with an envelope pattern and an NTIA/Public Telecommunications Facility Funding Grant to replace our current site with a new transmitter site, including an antenna. At about this time, IBOC/HD Radio was just beginning to take hold. Our new goal was to find a system that would not only resolve our problem areas and maintain our current

coverage, but also would transmit an HD signal in the most efficient manner possible.

After spending time with several vendors, **Dielectric** offered the package that most closely matched our requirements and our budget, with its DCBR antenna and transmission lines. The DCBR offered the ideal characteristics for our unique directional coverage needs and our combined operations of both HD and analog signals.

Supports analog, HD

Dielectric's DCBR is a circularly polarized antenna comprising a crossed dipole radiator mounted within a circular cavity. These grid cavities and a unique aerodynamic design significantly reduce weight and wind load, to provide significant savings in structural reinforcements of our supporting tower.

Dielectric was able to customize the DCBR to fulfill our directional pattern needs and enhance coverage in the specific areas where we needed it. Additionally, the high-power DCBR can be configured with two-input ports.

This dual-input design allows us to feed our digital transmitter onto the same antenna in a lossless configuration, supporting full-time broadcasting of two HD channels: HD1, which serves as our primary NPR news programming channel, mirroring content that is also carried on our analog broadcast; and HD2, which features the AAA music format XPoNential Radio, developed by Phila-

delphia's WXPN(FM) NPR affiliate. We are planning the addition of a third signal, HD3, for enhanced information services.



Dielectric DCBR

We have been pleased with the performance of the antenna in supporting our analog signal, as well as our entry into HD multichannel broadcasting. Broadcast Electronics provided both the high-power analog transmitter (BE-FM35) and our HD transmitter (BE-FMi201), each fed into its own port in the antenna via two runs of Dielectric transmission line.

I also was pleased with how smoothly the installation progressed, with Dielectric handling all of the details, from mounting the antenna on the tower to running approximately 3,000 feet of transmission line from each of the transmitters to the antenna inputs. Its crews also performed the structural strengthening of the tower,

and made sure the antenna and tower were able to withstand the heavy ice loads sometimes experienced in Charlotte.

We're now confident that we'll always have a broadband signal, especially in poor weather when the tower and antenna are covered in ice. Because our installation came as a complete package, we also enjoy the confidence of Dielectric's 10-year warranty.

Service and field support from Dielectric has been outstanding. John George, the sales representative for our region, was on site when we needed him, arranged for last-minute necessary parts and pieces, and supported the installation crew. He and Dielectric have continued to provide us with excellent follow-up service.

The installation of the DCBR has vastly improved our analog broadcasts. Becoming the first station in Charlotte and the first public station in the state to broadcast HD Radio has been a simple, stable process. Again, this is due to the dual-input design of the antenna that allows us to simultaneously feed both the analog signal and the digital signal to the same antenna. Coverage testing has proved that not only is the analog coverage much better, the digital coverage matches up with it nicely.

Now our coverage is excellent throughout the market area. We no longer receive complaints from the "growth areas." But as for the ultimate new antenna coverage test? Ask any public radio engineer.

One week after we began broadcasting from the new Dielectric DCBR, WFAE's spring fund-drive began. For eight days we asked listeners to call in a pledge, and, by the way, "give us your comments about the station." Not a single negative coverage complaint was logged by our many phone volunteers. We had made no mention of the new antenna on air. Success.

For more information, including pricing, contact Dielectric in Maine at (207) 655-8152 or visit www.dielectric.com.



World Class Products

FM Broadcast Transmitters from 30 to 10,000 watts, Translators with built in receiver and new IBOC Offset receiver for HD/IBOC applications.



Crown Broadcast IREC
www.crownbroadcast.com
Kkoselke@irec1.com

World Class Partners

Crown Broadcast would like to recognize the excellence of the following Organizations and the ministry they provide.



Educational Media Foundation
www.emfbroadcasting.com



HCJB World Engineering Center
www.hcjbeng.org

TECH UPDATES

Omegaline Series Requires No AC Power

The Omegaline 6600 Series from Altronic Research are convection-cooled terminators for 50 ohm coaxial transmission line systems. The company says manufacturers of transmitters, microwave components and power tubes, as well as transmitting stations, can be assured of suitable dummy load conditions during designing, testing, adjusting and aligning of transmitters and components.



The 6600 Series is suitable for IBOC applications. AC power is not required. Omegaline models include 6606, with a power rating of 6 kW; 6612, with a power rating of 12 kW; and 6620, with a power rating of 20 kW. Each model's frequency range is DC to 240 MHz.

For more information, contact Altronic Research in Arkansas at (800) 482-5623 or visit www.altronic.com.

Teracom Offers High-Power FM Filter

Teracom says its latest filter is designed for particularly demanding FM systems. The FM filter, for use in high-power applications, measures 35 x 64 x 24 inches. In order to improve system stability, its mechanical design includes temperature compensation, which the company says is less common with models of this size.



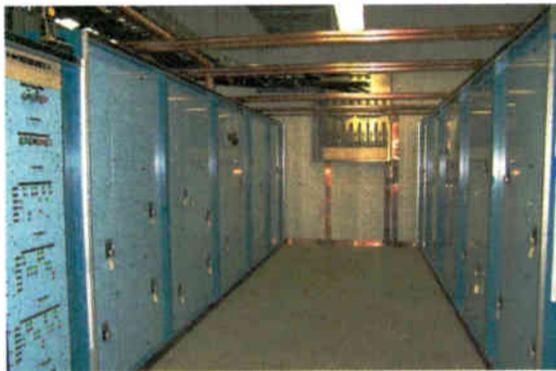
The filters are being used in two versions of FM combiners for 80 kW and 150 kW. "These combiners have a narrow band input of 40 kW, and include a modified 3 dB coupler in order to handle 150 kW output power," says Teracom's product line manager for broadcasting.

The company says larger cavities enable greater isolation and lower insertion loss for a tighter channel spacing down to 600 kHz. The new combiner offers increased power handling up to 40 kW at the narrow band input, and the temperature compensation on each cavity helps to ensure a stable performance over a wide temperature range.

For more information, contact Teracom Components in Maine at (207) 627-7474 or visit www.teracom-c.com.

Kintronic DA-2 Suitable for HD Radio

Kintronic Labs says the eight-tower 50 kW/25 kW DA-2 directional antenna phasing system constructed for WFDF(AM) in Detroit was designed for HD Radio. The antenna yields a +/- 15 kHz sideband impedance of less than 1.4:1 with a symmetric left-facing impedance locus, and yields a +/- 15 kHz farfield pattern amplitude variation less than +/- 2 dB relative to the carrier pattern within the 3 dB beamwidth of the major pattern lobes.



WFDF, Detroit

Due to the large number of towers used in each pattern, the daytime and nighttime phasing system cabinets had to be configured in parallel with overhead 3 1/8-inch EIA rigid lines used to interconnect the output ports of the day and night cabinets. Each cabinet bay is accessible for servicing and maintenance via an interlocked center front door or via an interlocked, hinged, lift-off rear door.

Front-panel controls with digital counters for the common point R and X and for the power and phase adjustment of each tower are provided. The network components are rated in current and voltage to accommodate a range of impedance variation and phase shift change under full carrier power plus 140 percent positive peak modulation.

For more information, including pricing, contact Kintronic Labs in Tennessee at (423) 878-3141 or visit www.kintronic.com.

AzEP Has Classic, Clamshell Versions of Optimus

Arizona Engineered Products offers Optimus antennas for central receive and mobile microwave applications. The company says they are high-performance and suitable for frequencies from 2-14 GHz and tasks such as data transmission or an audio link.

The antennas feature a 31-x-19-inch truncated reflector with offset feed. At 2 GHz, gain is 19.0 dBi with a VSWR of 1.50-1. Several polarity options are available to maximize signal separation: fixed dual polarity (horizontal/vertical), switchable dual polarity and switchable quad polarity, which adds circular left and circular right.

Mobile antennas come with a welded aluminum frame and can be ordered with bottom- or rear-mounted brackets.

Optimus central receive antenna systems are available in two radome styles: classic one-piece and two-piece clamshell. The latter design speeds installation and reinstallation because of a smaller, lighter mounting baseplate and prewiring of connections through the attached bottom fiberglass section.

For more information, contact Arizona Engineered Products at (520) 891-5858 or visit www.azep.us.



Optimus Clamshell

Your Best Move!

Make ERI part of your broadcast strategy.

HD Radio™ Solutions

HD Radio™ is trademark of iBiquity Digital Corporation.

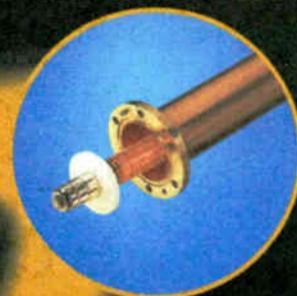
Antennas



Broadcast Towers and Structural Products



Transmission Line



ELECTRONICS RESEARCH, INC. **ERI**

Call Toll-free at 877 ERI-LINE • Visit Online at www.eriinc.com • Your Single Source for Broadcast Solutions™

TECH UPDATES

Staco Has FirstLine UPS for 10, 15, 20 kVA

Staco Energy Products offers the FirstLine three-phase uninterruptible power supply for broadcast studios and tech centers. The company says it is a true online, double-conversion UPS, and it is smaller and lighter than most three-phase UPS. Models are available for 10, 15 and 20 kVA applications, with input voltages of 208, 200 and 480 VAC, and can handle an input range of +10/-20 percent (166-229 VAC). Input frequency is 60 Hz, +/- 5 percent.

Features include full load walk-in from 25 percent to 100 percent of rated load in 10 seconds. Inverter output distortion is less than or equal to 5 percent THD for non-linear loads, and less than or equal to



2 percent THD for linear loads. Output voltage is regulated to +/- 1 percent of nominal at full load.

The FirstLine has a standard battery run-time of nearly eight minutes, with optional additional batteries for virtually unlimited run time, according to Staco. A transformerless power technology provides blackout protection and power conditioning. The company says its front-end harmonic correction eliminates the need for additional filtering, reducing interference and lowering the cost of operation. The double-conversion technology isolates a connected load from sags, swells, harmonics, noise and voltage imbalances without going to battery.

A control panel on the front includes alarms and monitoring capability, and it offers remote monitoring through an RS-232 connection, as well.

FirstLine is backed by a three-year warranty covering parts and labor.

Additionally, Staco recently published "Common Mistakes in Selecting UPS and How to Avoid Them," a multipage brochure that identifies 17 misconceptions and mistakes that occur when selecting UPS. Copies of the brochure are available for download at the company's Web site.

For more information, contact Staco Energy Products in Ohio at (866) 266-1191 or visit www.staco-news.com.

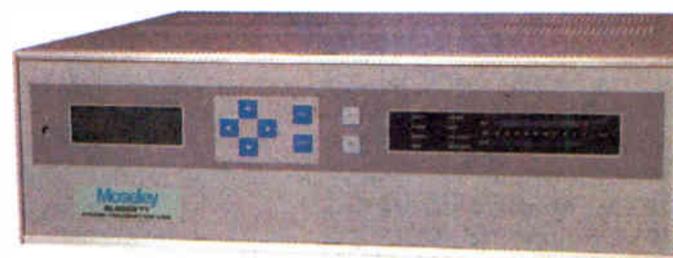
Starlink Connects Clusters to Distant Tx Sites

Moseley says its Starlink T1 digital STL/TSL system has no line-of-sight or distance limit, which makes it suitable for interconnecting market clusters to distant transmitter sites. Starlink T1 STL allows stations to transition air chains for HD Radio and multicasting. It transports linear uncompressed stereo program audio at 44.1 or 32 kHz sample rates. Both AES/EBU digital and analog inputs and outputs are included on each audio module for flexibility.

Optional Ethernet connections bring IP-based applications to remote transmitter sites. Additional highlights include mirrored servers, browser-based equipment control, security surveillance and network connections for Internet and e-mail.

Because the Starlink T1 STL is bi-directional, audio channels can be added for backhaul of RPU and satellite downlinks as well as voice channels for telephone extensions at the transmitter site. Data channels support RBDS or transmitter remote control. The company says this high capacity can reduce a station's communications costs when compared with using discrete audio, telephone and data circuits.

For more information, including pricing, contact Moseley at (805) 968-9621 or visit www.moseleysb.com.



XM Satellite Radio
WOR, Buckley Broadcasting
WCBS, Infinity Broadcasting
Radio Free Europe/Radio Liberty
WTOP, Bonneville Broadcasting
WXPX Radio, University of Pennsylvania
WIP Radio, Infinity Broadcasting
AOL Kids Online
KCRW/KLRU/KCRY/KCRI, Santa Monica College

STUDIOHUB+ CASTING CALL

CONNECT EVERYTHING
THE CAT-5 STUDIO WIRING SOLUTION
StudioHub+

From XM Satellite Radio, to WOR in New York, to AOL's Kids Online, StudioHub+ is changing the way broadcasting connects.

"The XM Washington location is the largest broadcast facility in the world and it's wired exclusively with StudioHub."

Ed Schwartz, VP, Broadcast Engineering
XM Satellite Radio

"The thing that we like most about StudioHub is that it's easy to connect. If you can plug in a network cable, you can wire your studio. It's very simple."

Thomas Ray, VP, Director of Engineering
WOR, Buckley Broadcasting, New York

"See this? Genius! Genius! So, the StudioHub, is really a good thing. And it means if you've got this, you can just plug into anything. It's really incredible. So, thank you Radio Systems. Thank you StudioHub!"

Rick Adams, Director
Interactive Children's Entertainment, AOL Kids

Join a cast of thousands who now count on StudioHub+, THE broadcast wiring solution.

StudioHub+ is the CAT-5 wiring system that lets you plug and play all your studio and rack-room equipment with an elegant system of pre-made cables and adapters.

StudioHub+ is the universal analog and digital approach to wiring all your broadcast gear.



See the Movie!

Log on to www.studiohub.com/themovie to view scenes of StudioHub+ installations at XM, RFERL, WOR, WCBS, WTOP, KCRW, WIP, WXPX, and KOL.

Radio Systems, Inc. • 601 Heron Drive • Logan Township, NJ 08085
Phone: 856-467-8000 • Fax: 856-467-3044 • www.studiohub.com

USER REPORT

ERI Lynx Serves Up Analog, Digital

Dual-Input Antenna Systems Ensure Analog, Digital Signals Have Same Horizontal and Vertical Patterns

by Michael Kernen
Chief Engineer
Greater Media Detroit
WCSX(FM)/WRIF(AM)/
WMGC(FM)

FERNDALE, Mich. In 2002 Greater Media agreed to cooperate with Ibiqity Digital (then known as USADR) to participate in experimental IBOC HD Radio broadcasts on WMGC(FM) in Detroit. At that time there was but one method of adding the IBOC digital sidebands to the station's antenna system: a high-level combiner, sometimes called a 10 dB combiner.

This method of combining is inefficient at best, costing 10 percent of the analog transmitter's power and 90 percent of the digital transmitter's power to be lost into a reject load. Of course, losing 90 percent of the digital transmitter's output to heat requires not only a transmitter much larger than otherwise needed for the digital system, but additional air conditioning and utility power requirements, too. You also have to be fortunate enough to have 10 percent headroom in your analog transmission system or that will have to be addressed as well.

Since that time several other methods of introducing the digital sidebands have become available. While each has its own merits and drawbacks, the dual-

input antenna is a favorite for several reasons. It offers the advantage of nearly identical digital and analog coverage patterns and efficient signal combination.

Out with the old

Greater Media Detroit has two of



A photo of WRIF's DI-6A antenna bay showing dual feed lines.

and the antenna is much more effective at reducing nulls.

Naturally, any system this complex can be tricky to perfect. The process of adjusting the antenna involves adjusting the hybrid power divider to achieve maximum digital-to-analog input isolation as well as adding slugs to the feed line to adjust the match. Adjusting isolation is done with a network analyzer connected to both ports. A signal is generated on one port while the return loss is measured on the other.

Adjusting the match is done by slugging the transmission line at a distance calculated by ERI's engineers. The results after field-matching

**Coverage from
the DI-6A is fantastic.
The pattern is better
than that of the
old RCA and the
antenna is more
effective at
reducing nulls.**

WMGC's DI-12A were impressive. How's a return loss of -60 dB on the analog input and -34.2 on the digital input sound? Isolation between the digital and analog inputs measured -39 dB before the circulator.

I experienced some difficulty while setting up the WMGC circulator due to a faulty reject load. ERI showed made sure a new load was at my door next day. When a small air leak developed, ERI had a technician on the tower the next day.

The high-quality Lynx DI antenna system is the ideal way to add HD Radio to an FM station.

For more information, contact ERI in Indiana at (812) 925-6000 or visit www.eriinc.com.

"Who says
IP-Audio is
the future?"

"They do."

Some very well-known companies are embracing IP-Audio using Livewire™.



The Livewire logo is proof your new studio equipment can connect compatibly to IP networks for linear, high-resolution audio.

Livewire: professional networked audio over Ethernet.

© 2006 Axia Audio. Livewire™ TLS Corp.; all other marks™ their respective owners.

Electronics Research Inc.'s Lynx dual-input antenna systems installed. For WRIF, a superpowered Class B station, the Lynx DI-6A fit the bill.

The DI-6A, as the name suggests, is a six-bay dual-input antenna system. For WMGC, a standard Class B, the DI-12A was used. The principle advantage of a dual-input antenna system is that both analog and digital signals are radiated from the same elements. This eliminates the need for stations to apply for an STA and ensures that both analog and digital signals have the same horizontal and vertical pattern and the same gain.

The DI-6A went up in place of a four-bay RCA antenna that had served since the '70s. The RCA was circularly polarized and employed null fill, but was showing age; the new ERI was certainly welcome.

WRIF maintains its position on a TV tower because it would lose its grandfathered status and be forced to comply with the Class B power equivalency. Side-mounting the antenna is the only possibility on this tower so we consulted with ERI and analyzed several mounting options to optimize the pattern.

ERI range tested the new antenna system to optimize the pattern further. ERI's crew re-used the existing 3-1/8-inch rigid line and added a 2-inch coax to feed the second input. The DI's port isolation and match were adjusted by ERI's field engineer prior to their departure to ensure the system's optimum performance. To further isolate the digital transmitter from any energy coupled from the analog input, ERI included a circulator.

The net result is that the digital transmitter is effectively insulated from the much hotter analog signal. Coverage from the DI-6A is fantastic. The pattern is much better than that of the old RCA

Coming up in Buyer's Guide

**Logging, Profanity Delay
& Timeshifting**
January 17

**Portable Audio &
Newsgathering**
February 14

**Audio Production
& Creation**
March 14

**Microphones &
Audio Monitors**
April 11

Transmitters
May 9

USER REPORT

Salem Uses Shively Lindenblad Antenna

The Stainless-Steel Model Offers Uniform Coverage With Little Multipath or Picket Fencing

by **Scott Horner**
National Project Manager
Salem Communications

CAMARILLO, Calif. Since the 1980s, Salem Communications and Shively have had a good working relationship. Shively has been Salem's primary provider of FM antennas and combiners. This is, in part, due to the efforts and customer service Bob Surette, Edd Forke and Joe Rohrer and the rest of Shively staff have provided Salem over the years. Shively has provided us with pattern studies and engineering on proposed sites that have difficult tower configurations or that involve directional antennas. We have found Shively's real-world results reflect the accuracy of the predicted coverage from its pattern studies.

On occasion we have had to work through complex, time-consuming mounting configurations, but Shively has always been able to provide detailed drawings in a timely manner.

We have had good results from Shively Models 6810, 6813 and 6814 multibay antennas, which are typically leg- or face-mounted depending on the desired pattern. Shively makes another antenna, however, that Salem also has had success with in markets where a true omni-directional pattern is desired: the Lindenblad antenna.

Empirical concept

The Lindenblad design concept is attributed to N.E. Lindenblad, who developed and patented the concept in 1941 for a circularly polarized television antenna atop the Empire State Building. Shively was the first antenna manufacturer in the United States that has utilized this design for FM broadcasters. Salem was one of the first broadcasters to use it in Chicago, Pittsburgh and other markets.

Performance-wise the Lindenblad antenna exhibits uniform horizontal and vertical patterns when mounted on a pole. Each Lindenblad "bay" or level uses a four-around radiator with power dividers and inter-connect cabling. Additional levels/bays can be added for increased power handling and gain, just like a conventional FM side-mount or panel antenna. The Lindenblad radiators and mounts are constructed of stainless steel.

One point to bear in mind with the installation of the antenna is that it has many more parts and interconnects than a conventional FM antenna and Shively will provide the mounting hardware necessary for optimal performance, provided it is supplied with accurate tower structural information and proper rigging and installation criteria have been met. Salem also has elected to have Sean Edwards from Shively field service on-site with a network analyzer to confirm the system prior to on-air operation.

In the Chicago area, the Lindenblad's

uniform coverage presented little multipath or picket fencing from our transmitter location in Arlington Heights. Also, the Lindenblad is broadband enough that Chicago's snow had little effect on the tuning.

In Pittsburgh, the Lindenblad antenna was installed in the first quarter of 2000. The Lindenblad's performance was everything that was promised. With the old antenna, we had a wide null to the back in the vertical polarization. The Lindenblad not only cured this problem, but it reduced the multipath in the city. We have had heavy icing conditions here and I have never noticed any rise in VSWR.

During this past summer, Salem Communications purchased and installed a Shively 6017-2/4-PS two-level, four-around Lindenblad-style antenna for our Class A FM station licensed to Smyrna, Tenn. We had been granted a construction permit to relocate the transmitter site from the existing La Vergne site to a new site. We executed a lease on an existing Cane Ridge cellular tower with the provision that we could, at some point, install a 25-foot top section exclusively for WFFH(FM).

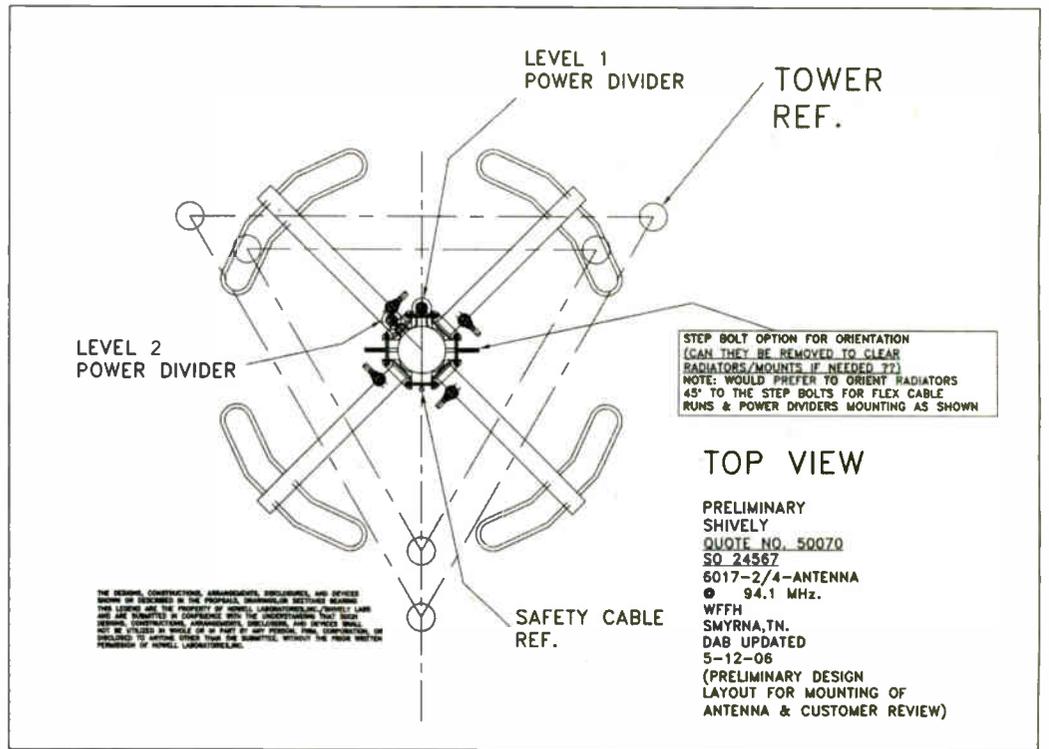
In August 2004, we were granted a CP to relocate to a new site and operate at an AGL of 53 meters (174 feet) with an ERP of 3.2 kW. This would be an improvement over the existing facility as far as ERP and AGL.

To give you a little history, three different Shively antennas were used during the course of this project. Initially, when the

2004 CP was granted, we opted to install a Shively three-bay 6814 1/2-wave antenna with radomes, leg-mounted on a large self-supported cell tower. We provided

orientate a dedicated 25-foot triangular top section on the cell tower on a bearing of 320 degrees true. This provided WFFH with the best azimuth pattern toward Nashville.

The caveat to this pattern, however, was that the Shively pattern study showed a deep vertical component null in the oppo-



Drawing of the Lindenblad, top view.

Shively with the tower structural information and orientation. Shively ran several pattern studies to provide us the predicted coverage of the Nashville metro, based on various mounting configurations.

We all agreed on a pattern that exhibited the best uniform H/V plot toward Nashville and purchased and installed the Model 6814. Concurrently we had applied for a height increase to provide a center of radiation at (COR) 320 feet AGL. This is where the 25-foot top section provision in the lease came into play. Based on the known Shively patterns using face-mounted antennas, we had opted to install and

site direction, away from Nashville, toward the town of Murfreesboro. We needed to come up with a new plan that would provide a truer omni-directional pattern. It was decided that the Shively Lindenblad antenna mounted on a pole would provide the desired pattern.

Our decision was validated once the Lindenblad was up and running. The performance has provided good coverage of both markets with minimal multipath.

For more information, including pricing, contact Shively Labs in Maine at (888) SHIVELY (744-8359) or visit www.shively.com.



At Dielectric, you'll find the same spirit of innovation that inspired "Doc" Brown to build a better radio antenna in 1942 alive and well in our full range of broadcast solutions:
**TV & FM Broadcast Systems • Tower Lighting
Mobile Media • M2M Solutions**

Convergence is poised to change our industry more in the next five years than the previous sixty years combined. Working together — the possibilities are boundless.



www.dielectric.com

got connectors? cables & connectors
racks
tools
problem solvers
test gear
& much more
www.systemsstore.com

USER REPORT

Rolling Hills No Match for SynchroCast

Harris Intraplex SynchroCast Multiplexer Addresses Signal Coverage, STL Over Difficult Terrain

by **Scot Mathews**
Director of Engineering
Simmons Media Group

SALT LAKE CITY Simmons Media Group owns 10 radio stations around Salt Lake City. We had been experiencing ongoing signal problems, as our towers are located on mountains and the hilly terrain interfered with the signal. As director of engineering, it was my responsibility to find a solution to our dilemma that also offered versatility. The choices were limited due to the complexity of our needs.

We first tested a Harris Intraplex SynchroCast digital multiplexer system in a station we own in Austin, Texas, and installed a SynchroCast into one of our stations locally after seeing positive results. Pleased with the results, we expanded the system to three more Salt Lake stations: KEGA(FM), KJQN(FM) and KFMS(FM). We enjoy much better coverage and can better communicate with all transmitter sites. The listeners also notice the difference.

Additionally, we've installed frequency booster units into seven regional locations to try to combat the dead zones found between towers: Ogden, Bountiful, North Salt Lake, Salt Lake, Sandy, Provo and Park City. The boosters are working well with SynchroCasts. As we expand we're adding more boosters in Heber and Alpine, and will likely add more SynchroCasts.

Dark shadows

Our transmitter sites are hidden inside the Utah mountains. Some sites are so remote, they are not serviced by the telephone company. We beam the signals to

the sites via microwave, using a Proxim GX.16 that delivers digital quality T1 with a capacity of 16 T1s. There are a total of 10 microwave hops. The SynchroCast data uses just one T1.

Microwaves weren't the problem. The picturesque but problematic rolling hills created shadow areas in the towers' signal paths. Listeners in many different areas had trouble receiving the stations. SynchroCast came to the rescue and the problems disappeared.

In some areas, signals from multiple towers atop the mountains were overlapping each other, due in part to the frequency boosters. This was normal and was expected — but troublesome nonetheless. SynchroCast simulcasts on multiple, overlapping transmitters on the same frequency, which gives us seamless crossovers between boosters with just a momentary and barely audible glitch. The fadeouts and crosstalk are problems of the past.

Also, eliminating the overlaps bolstered the signal coverage area, allowing even more listeners to tune in daily.

SynchroCast reduces or eliminates fadeout and overlap errors caused by multiple transmitters broadcasting on the same frequency in the same area. An orbiting GPS satellite controls

audio phase alignment and synchronization of the carrier frequency, and compensates for network routing changes. It automatically adjusts delays and "locks" together signals from multiple transmitters. The result is a neat transition from one footprint area to the next, where fadeouts and crosstalk



A Harris Intraplex STL system, open, showing a series of modules for T1 distribution, including SynchroCast.

were once commonplace.

Harris DigitCD exciters are used with the pilot synch option, and PTEK amplifiers to achieve the proper transmitter power output. Every booster site uses a Jampro balanced combining system and one common antenna. This makes it easy to add a new station without having to add new antennas to the tower. The Intraplex T1 STL system uses SynchroCast to time boosters.

We were looking for a product that offered more than just cost-efficiency.

We found that SynchroCast was the only system that was capable of two-way communication and transmitting audio and data. SynchroCast is a multi-functional multiplexer add-on for the Intraplex, and combines audio, data and IP phone. Beyond the elimination of poor signals, SynchroCast connects the three stations with company headquarters in Salt Lake City, and distributes the phone system from the PBX to all sites as well as OPX circuits, data cards for RS-232 devices and Ethernet, which enables us to do IP-based remote control and security cameras in real time. Another channel gives us a mono audio feed from each of the sites back to Salt Lake City for confidence monitoring.

The scalability of Intraplex allows us to expand as much as we desire, especially given the increased revenue forecasts due to our expanded signal coverage. Intraplex holds 16 modules and can be linked to more Intraplex units as needed. Individual modules can be activated or deactivated using a Web browser or SNMP network manager. Using new and existing modules, services like SynchroCast can be multiplexed into a single stream for one location or separately to more locations.

Simmons Media owns the entire distribution system, independent of the phone company, with no monthly costs or additional fees. SynchroCast has the capacity for multiple stations, so we lease out some of the excess space to other stations in the market. The system is designed for further expansion with SynchroCast as we add more stations in the future.

For more information, contact Harris Radio Broadcast Systems in Ohio at (408) 782-1201 or visit www.broadcast.harris.com.

STATION/STUDIO SERVICES

MANY HAPPY RETURNS.

"Consistently well written & produced." - MN

"Highest Quality." - NY

"Over \$22,500 in revenue for our 'one time' buy out." - ON

"A Money-maker." - WI

"They're easy to sell, and attract hard-to-sell, choosy clients." - TX

(We'd love to have you visit our website - and see if there's an idea you can put to profitable use!)

Free Demos.



GRACE BROADCAST SALES
 Sound Ideas for Building BusinessSM

Questions? Call us toll-free (888) 472-2388.
www.gracebroadcast.com

ATTENTION PROVIDERS!

Promote your services to **Radio World's** readers. Reach Radio Station owners/managers and engineers with your message.

For information on affordable advertising call **Claudia** at **1-703-998-7600, ext. 154.**

Q1 SALES BOOSTERS from GraceBroadcast.com

Fully produced market-exclusive :30- or :60-sec. radio features you can download and **SELL** for:

NEW YEAR'S
DON'T DRINK & DRIVE CAMPAIGN
WINTER SAFETY TIPS
BLACK HISTORY MONTH SPOTS
VALENTINE'S DAY VIGNETTES
FFA WEEK SALUTES
MORE!

Makes Sense!
 (Dollars, too.)

E-mail **Claudia Van Veen** at cvanveen@imaspub.com or call **1-703-998-7600 x 154** to reserve your space.

Easy Ordering In Nanoseconds



With the **ONLY** 1,800+ page catalog of the **NEWEST** information **4 times a year**, and daily updates to over 720,000 products on-line, you can depend on Mouser for easy ordering in nanoseconds!

mouser.com (800) 346-6873

MOUSER
 ELECTRONICS
 a tti company

The Newest Products
 for Your Newest Designs

The **NEWEST** Semiconductors | Passives | Interconnects | Power | Electromechanical | Test, Tools & Supplies

Mouser and Mouser Electronics are registered trademarks of Mouser Electronics, Inc. Other products, logos and company names mentioned herein may be trademarks of their respective owners.



RF Specialties®

CALL TODAY FOR D-75 PRICING

Principal Office Locations

RF Specialties of Washington, Inc.
Bob Trimble
Ph: 800-737-7051

RF Specialties of California
Sam Lane, Bill Newbrough
Ph: 800-346-6434

RF Specialties of Missouri, Inc.
Chris Kreger, John Sims, Rick Funk
Ph: 800-467-7373

RF Specialties of Pennsylvania, Inc.
Dave Edmiston, Harry Larkin, Ed Young
Ph: 866-736-3736

RF Specialties of Georgia
Alan Slaughter, Chris Hall
Ph: 800-476-8943

RF Specialties of Texas, Inc.
Don Jones, Wray Reed
Ph: 800-537-1801

Great **DIGITAL SOUND** for less

D-75 Radio Console



Shown here with 12 Input Channels. Also available as 18 Input Channel Mainframe

 **AUDIOARTS ENGINEERING**

EVERYTHING you need in a COMPACT DESIGN:

- ✓ 100 percent modular design
- ✓ Network ready
- ✓ Dual fader superphone
- ✓ Switched meters
- ✓ Table top design



Configuration is SIMPLE using the hinged meterbridge

For more info on our 14 office locations, products, and services visit : www.rfspecialties.com

World Radio History

Is Your Media Ministry Effective?

Discover the power of strategically incorporating media during NRB 2007 in Orlando!



CONVENTION & EXPOSITION

The Premier Event in Christian Communications

This international event networks thousands of Christian communicators, from program producers to authors, pastors to engineers, directors to vendors. NRB's professionals emphasize strategy and innovation to tap the power of new media ministry models.

Beyond highly qualified speakers in keynote sessions, hands-on demos in the Tech Lab, and the world's largest Christian media exposition, NRB 2007 provides professional training in four key areas:



- core principles for operating a broadcast ministry



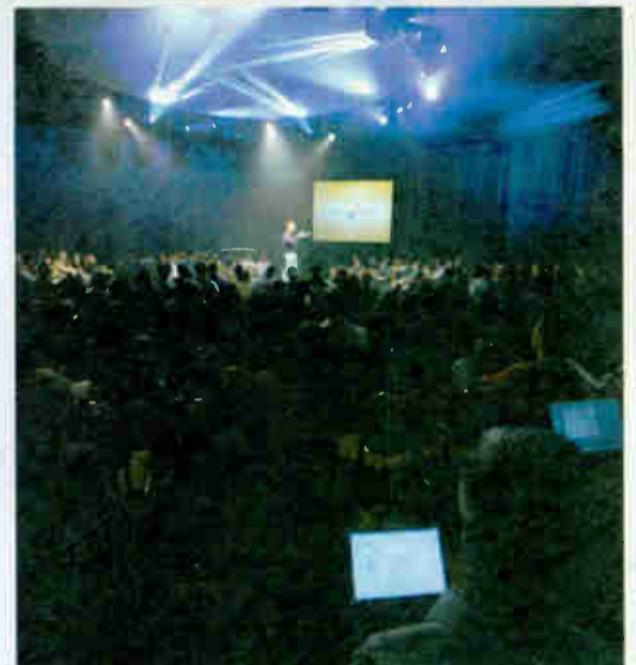
- an innovative media channel seeking effective ways to engage our culture



- equipping leaders with tactical approaches to optimize results



- in-depth sessions hosted by educational institutions, specialists, and vendors



If you're looking for a smarter way of doing media ministry, you'll find it at NRB! See you in Orlando!

World Radio History

NRB 2007 | February 17-20

Orange County Convention Center &
Rosen Centre Hotel, Orlando, Florida

www.nrbconvention.org

TECH UPDATES

PowerClamp Series 4 Units Rid AC Lines of Spikes

Henry Engineering expanded its line of PowerClamp transient voltage surge suppressors with the Series 4 units, which the company says eliminate spikes, surges and noise from AC power lines to prevent damage to electronic equipment.

The Series 4 PowerClamp units are rated at 60,000 surge amps per phase and are suitable for protecting equipment used at broadcast studios. They clamp transients to within a few volts of the AC waveform, and "scrub" noise and harmonics from the AC power line.

PowerClamp TVSS units use a combination of technologies that react to both the amplitude and the rise time of line disturbances. They shunt voltage spikes to ground, which Henry Engineering says prevents equipment damage and unreliability. Their automatic sine wave tracking features monitor the average AC voltage, and maintain a narrow threshold over which the clamping circuitry activates. Spikes and surges are attenuated to within a few volts normal voltage, without causing clipping or distortion of the AC sine wave.

When PowerClamp's surge attenuation circuitry is activated, there is minimal voltage drop across its internal components, minimizing power dissipation. This keeps the units cool and prevents degradation in performance, the manufacturer says.

The larger Series 8 PowerClamp units eliminate lightning-induced power line spikes, reducing them to within 10 volts of normal AC voltage.

PowerClamp units are installed in parallel with the incoming AC service, so the company says it is not necessary to match the load current to the PowerClamp, as performance remains constant under changing load conditions. Another advantage of parallel installation cited: in the event of failure, the PowerClamp unit will not interrupt power to the load; the equipment remains on if the PowerClamp fuse blows.

PowerClamp TVSS units are available in several sizes suitable for transmitter sites, studios and translators.

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



TFT Ships 5200 Series STL

TFT is shipping its front-panel, frequency agile analog STL system, the 5200 Series. The Model 5290 transmitter and Model 5291 receiver are both monaural and composite stereo, and can be re-configured in the field. The company says the frequency agility allows a single system to cover all applications for analog STLs and to be ready for service on short notice, and that these features make the 5200 series suitable for back-up and temporary applications.



The 5200 low-cost analog system includes models for 944-952 MHz and, for the international market, on other popular frequency bands. Ten-watt transmitters are standard, and 20-watt transmitters also are available at a slightly higher price. There also is a MUX/SCA available for installations that require additional sub-carriers for programming or remote control data applications.

For more information, including pricing, contact TFT Inc. in California at (408) 943-9323 or visit www.tftinc.com.



FCC APPROVED

KinStar

The first electrically short AM antenna with FCC pre-approved efficiency and radiation characteristics for full time use in the U.S. market.

KinStar Features:

- Direct replacement for a quarter wave tower with 67% reduction in height.
- Approved for non-directional Class B, C or D full-time operations.
- Land requirement: Must accommodate 120-radial quarter wave ground system.
- Requires no lights or paint.
- Input bandwidth compatible with IBOC HD Radio.
- Enhanced survivability in hurricane zone due to short height.
- Excellent, low cost auxiliary antenna.
- Suitable for installation near airports.



423.878.3141 fax 423.878.4224 Email: ktl@kintronic.com www.kintronic.com

Products & Services SHOWCASE

Do Unattended Live Remotes

DR-10 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-10 & start saving money now!
www.circuitwerkes.com



CircuitWerkes, Inc. - 352-335-6555

OMNIRAX *The Engineer's Choice!*

BROADCAST FURNITURE

What people are saying about Omnirax...

"Within a short amount of time Omnirax was able to come up with a beautiful concept for our new studios."

"The Omnirax design makes these studios incredible for talent and operators on both sides of the console."

"Our furniture from you not only fit into our budget and timeline, it was very well constructed and looked beautiful. I expect to be outfitting many more facilities with Omnirax..."

"I was impressed with the exceptional care given packaging for shipment. A few very large and potentially fragile components made it cross-country completely unscathed"

"I wholeheartedly recommend Omnirax to everyone."

P. O. Box 1792 Sausalito, CA 94966
800.332.3393 415.332.3392
FAX 415.332.2607

www.omnirax.com info@omnirax.com



STEREO HEADPHONE AMPLIFIER

THE ALL NEW AF-SH1 FEATURES:



Shown in AFM-DC1V tabletop chassis

- Integral Long-Life VCA Stereo Level Control
- Balanced or Unbalanced Inputs
- Switch-Selectable Input Sensitivity
- Switch-Selectable Mono (Left) or Stereo Operation
- Amplifier To Drive High or Low Impedance Headsets
- Convenience of APPFLEX™ Mounting Possibilities

The AF-SH1 is part of the group of versatile APPFLEX products from Radio Design Labs. These modules combine advanced circuitry, durable all-metal construction, attractive RDL ULTRASTYLE™ colors and versatile mounting possibilities. APPFLEX modules are ready to drop in a cabinet, chassis or panel cutout. Numerous ULTRASTYLE wall mounting accessories and tabletop chassis are optionally available to facilitate system design.

SYSTEMS SOLUTIONS

www.rdl.net.com
RDL • 659 N. 4th Street • Prescott, AZ • 86301



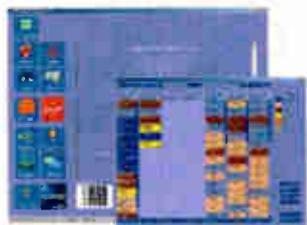
The STATI-CAT LIGHTNING PREVENTION SYSTEM provides a continuous, low-resistance discharge path for the static electric charge on tall structures. Dissipation points are 1/8" stainless steel rods.

This affordable and rugged system has proven itself in the field for over 20 years.

Cortana
Corporation, Inc.

Write or call for a free brochure and design
P.O. Box 2548, Farmington, N.M. 87499-2548
Toll Free: 888-325-5336 • Fax: 505-326-2337 • www.cortanacorporation.com

TROUBLE WITH CONTEST WINNERS?



NeoWinners

Contests / Winners / Prizes tracking software
Used by over 60 major radios worldwide

+1 (210) 757 4700

www.neogroupe.com

Database experts

AM RF Systems...



without the surprises.

LBA Technology is your proven, worldwide supplier of HD radio ready AM antenna systems. Our array of RF products includes directional antenna systems, duplexers and triplexers, ATU's, and components for every power level. LBA systems are designed and custom fabricated to your distinct requirements.

We put our 40 years of AM RF experience into helping you reach farther and sound better! See what we can do for you at www.LBAGroup.com or call us at 252-757-0279



LBA Technology, Inc.

Reach Farther, Sound Better.™

252.757.0279 • www.LBAGroup.com • 3400 Tupper Drive • Greenville, NC 27835

USER REPORT

Barix Provides Yukon With STL Link

by Rob Hopkins
President and CEO
Open Broadcaster

WHITEHORSE, Yukon Territory Open Broadcaster is an open source software solution created to run radio stations and audio services in remote regions. It is used for commercial, licence exempt and community radio service in three Yukon localities: Whitehorse, Tagish and Haines Junction. Listeners in these communities can participate and create their own shows through the Open Broadcaster Web interface with playback on local FM stations by reserving blocks of airtime.

The service partners with Polarcom, the largest private IT company in the Yukon, to host the required network equipment in Whitehorse. Playlists, content and schedules are created on the Whitehorse server and to the remote stations.

In the Tagish station, it is essential to keep the overall administration and headaches to a minimum on a technical level. Tagish in particular is an extremely

If emergency situations arise, the Barix equipment is programmed to prioritize emergency broadcast information instead of the main audio stream.



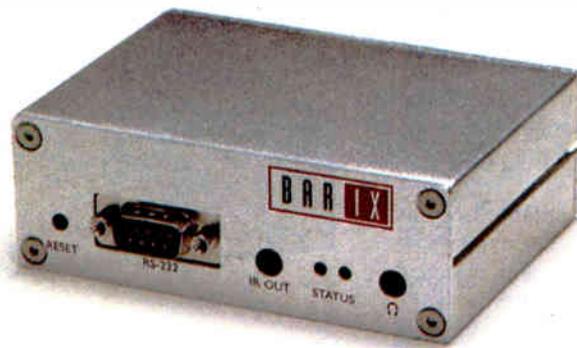
Exstreamer

the playlist information and feeds it to a mixing board at my home, which subsequently feeds the Barix Instreamer.

The Instreamer encodes the signal and sends it over the IP network at 128 kbps to the Tranzeo wireless link on the mountain-top. An Exstreamer at the transmission site decodes the audio stream and feeds it directly to a Crown FM transmitter using a common CAT-5 cable. This solution is robust and draws little power.

While the Barix equipment provides a dependable continuous audio stream, these units also offer a reliable means for communicating emergency information. Typically there are no operators at these radio stations, especially at night. If power outages, fires, weather-related or other emergency situations arise, the Barix equipment is programmed to prioritize emergency broadcast information instead of the main audio stream. An agency or person with the appropriate permission can upload the announcement by using the Open Broadcaster software, and the Barix priority port immediately recognizes the EAS stream.

The Barix equipment also is an excel-



Instreamer

lent STL choice for our situation due to its reliability. It is often difficult to reach the transmitter sites, and the sites are often hit with power outages ranging from seconds to hours. The devices immediately power-up and stream the audio to the transmitter once power returns. If an emergency message comes through on the second port, it immediately overrides the main port audio.

Configuration is simple. A Web interface allows you to configure the Instreamer and Exstreamer as IP devices, and that same interface offers a way of making adjustments, although in over one year of continuous operation I have not had to make a trip to any transmitter site due to Barix Exstreamer failure.

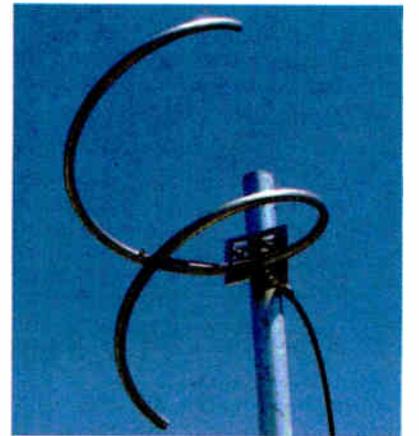
This system also can be easily expanded to add new stations. Simply add an Exstreamer and plug into a TCP/IP network or wireless link, and you have cost-effective scalability for multiple transmission sites. And by bringing the Internet to the transmitter we are prolonging the life of our transmitters, which is important for broadcasting in harsh conditions.

For more information, including pricing, contact Barix Technology Inc. in Minnesota at (866) 815-0866 or visit www.barix.com.

TECH UPDATE

Jampro Offers Circularly Polarized JLCP

The Jampro JLCP is a low-power circularly polarized antenna suitable for omni-directional applications such as LPFM, translator and booster stations. The company says the JLCP helix design gives low-power stations the flexibility needed to meet their individual requirements.



The antenna features stainless steel and hot-dipped galvanized steel construction. A stacking harness is included when multiple bay arrays are ordered. Jampro says similar designs have low V-Pol compared to JLCP, and the result is that JLCP has better car reception and building penetration. JLCP is field-tunable from 88 to 108 MHz.

Additional highlights include VSWR 1.5:1 or better +/-150 kHz. The antenna comes with a type DIN 7-16 input connector. Optional tower leg brackets to three inches outside diameter are available upon request.

For more information, including pricing, contact Jampro in California at (916) 383-1177 or visit www.jampro.com.

isolated location, so it simply isn't possible to produce the manpower to operate a highly complex technical operation. Open Broadcaster takes advantage of my personal software interface and concept to allow the audience to program the on-air operation and essentially create a two-way operation on what is historically a one-way medium. This vastly reduces the process of operating a radio station and creates an interactive platform.

Forget microwave

I oversee the service from my home office in Tagish and on the road, and the isolation and distance between the mountain top transmitter site necessitates a reliable STL connection. Open Broadcaster relies on the Barix Instreamer and Exstreamer platform for a reliable point-to-point STL connection. Combined with a Tranzeo wireless link system, the entire platform cost under \$1,000 complete for each end running over five miles, and is just as effective as the far more expensive microwave STL systems that would be required in this region.

Each site uses the same basic STL system, although this story will focus on Tagish. A Linux computer at my studio connects to the Whitehorse servers to pull

Do not take a BRICK to the NEXT PRESS CONFERENCE ... nor your mp3 player



Take the AEQ PAW 120 PROFESSIONAL RECORDER

Like mobile telephones, the latest AEQ digital recorder fits comfortable in your hand and in your pocket! The PAW 120 is the ultimate digital recorder for journalists who value comfort and quality!





PAW 120's main features:

- Record, play and edit Linear PCM and MPEG compressed audio Built-in speaker.
- Built-in microphone and XLR adapter, with connections for mono or stereo external dynamic or condenser microphone, including phantom power.
- Stereo or Mono Line Input and Output. Appears as USB removable external device compatible with both Windows and Mac OS.
- Support of BWF file format, allowing for easy integration with radio automation systems.
- Uses two AA dry cells or rechargeable batteries.

AEQ also offers excellent communication and audio equipment:

■ Digital consoles and audio routers for radio and TV ■ The latest in RPU Technology ■ Stationary and portable ISDN Audio Codecs and Telephone Hybrids ■ Advanced Multi-Channel Talk Show System ■ Multiplexers, Analogue Mixing Consoles, AD Converters, Monitors, and Digital Commentary System for large sport events.

AEQ USA
Phone: +1 954-581-7999
Toll Free: 1-800-728-0536 (US only)
e-mail: sales@aeqbroadcast.com

www.aeqbroadcast.com

TECH UPDATES

WorldNet Oslo Delivers in Real Time on 28 Channels

The WorldNet Oslo from Audio Processing Technology is a modular, multiple-channel audio multiplexer that transports content over various digital networks. The company says the unit delivers real-time near-lossless quality audio on up to 28 channels, and its feature set incorporates Enhanced apt-X coding, Redundant power supplies and automatic back-up functionality are included.

The system architecture and various available options provide a customizable platform with room for expansion. Audio can be transported via synchronous or packet-switched networks with support for interfaces such as E1 (2 Mbps), T1 (1.5 Mbps) and Ethernet (IP). Plug-in modules are available in more than 12 configurations offering analog, AES/EBU, simplex, duplex and 5.1 phase-locked options. In addition to uncompressed linear audio and J.57 companding, the WorldNet Oslo supports 16 or 24-bit Enhanced apt-X offering cascade-resilient audio with a less than 2 microsecond delay.

The WorldNet Oslo supports mono and stereo for FM and HD Radio. It also is designed for 5.1 multichannel applications. The ability to offer phase matching across multiple channels helps the surround sound image remain intact throughout, which the company says delivers true audio fidelity for 5.1 contribution and distribution projects.

Unit settings can be managed remotely using the Network Management System, a graphical user interface that provides configuration, control and fault monitoring capability across multiple WorldNet Oslos and other APT IP audio codecs.

For more information, contact APT in New Jersey at (800) 955-APT-X (2789) or visit www.aptx.com.



PT1 Suppresses Transient Voltage Surges

Superior Electric says the single pulse surge current capacity, per mode, of its PT1 Series Stabiline transient voltage surge suppressors meets NEMA recommendations. The MOV arrays share current equally to suppress transients before they reach sensitive loads while capacitors filter out high-frequency noise and low-level transients. The company says the PT1 Series is tested to withstand surge currents in accordance with ANSI/IEEE and meets the safety requirements of UL1449 second edition.

Units are available with surge current capacities of 25 kVA, 50 kVA, 80 kVA and 100 kVA per mode and provide all mode (L-N, L-G, N-G and L-L) protection. Units are housed in Nema 4X fiberglass-reinforced polyester enclosures. LEDs provide unit status and Form C dry contacts are standard. Models are available for single- and three-phase electrical configurations. The suppression filter components are bolted directly to copper bus bars, lowering systems impedance and clamping voltage.

The PT1 units are intended for installation at the service entrance and/or distribution panels. They respond to high-current lightning incidents and other transient voltage surges.

For more information, contact Superior Electric in Connecticut at (860) 585-4556 or visit www.superiorelectric.com.



Myat 904CPX Suitable for Triangular Towers

Myat Inc. offers passive components including antenna, RF components and filter systems for radio broadcast applications. Myat has partnered with RFS America to supply broadcasters with a line of FM antennas, including the 904CPX



antenna systems. This circularly polarized antenna is suitable for triangular towers.

The company says the design uses stainless steel radiators with a galvanized screen that ensures a long life, even when installed in remote hostile environments. The 904CPX panels can be arranged to provide the required coverage for a particular service.

Myat also manufactures the necessary filters and multistation combiners to complement FM antenna systems.

For more information, contact Myat Inc. in New Jersey at (201) 684-0100 or visit www.myat.com.

SH SHOWCASE SE

Products & Services

SAMPLE RATE CONVERTER

SONIFEX
Redbox

CALL FOR NEW CATALOGUE

Redbox RB-SC1 Sample Rate Converter

- Superb conversion quality.
- AES/EBU and S/PDIF inputs and outputs.
- AES/EBU, S/PDIF and TTL wordclock synchronizing inputs.
- Sample rates up to 24bit 96kHz.



INDEPENDENT AUDIO

T: 207 773 2424

E: info@independentaudio.com
www.independentaudio.com

Visit our website for details:
www.sonifex.co.uk

WEATHER RADIO Model CRW-S



Price \$540.00

Sensitivity .28 microvolts for 12 dB quieting. All 3 frequencies. Alert tone demutes receiver, closes relay and gates audio to 600 ohm rear terminals. Another set of rear terminals has continuous 600 ohm audio output. Double conversion crystal controlled, crystal filter in first I.F., ceramic filter in second I.F. Dual gate MOS FET front end. 50 ohm coaxial input. Adjacent channel (± 25 kHz) down to 70 dB. 19" rack mount, 3.5" H, all metal enclosure. In stock—available for immediate delivery.

GORMAN REDLICH MFG. CO

257 W. Union St. • Athens, Ohio 45701
Phone 740-593-3150 • FAX 740-592-3898

www.gorman-redlich.com/jimg@gormanredlich.com

TECH UPDATES

HVCA-CKE Has Retrofit HV Rectifiers

HVCA-CKE provides retrofit HV rectifier packages for AM, FM or television transmitters, with systems available from 5 to 35 kW in single- and three-phase configurations for HV rectifier requirements including CCA rectifiers.

HV Component Associates (HVCA) says it specializes in the design, development and manufacture of high-voltage rectifiers, bridge rectifiers and special assemblies for specific customer applications. CKE is a manufacturer of high-voltage silicon rectifiers, MOVs, selenium suppressors, silicon carbide varistors, high-voltage disk ceramic capacitors and high-current/high-voltage assemblies, and also builds custom assemblies.

Originally, HVCA was the rectifier division of Galileo Electro-Optic Corp. formed in the early 1960s. In 1989, HVCA purchased the Conditioning Semiconductor Devices Corp., and began manufacturing epoxy power blocks that had been formerly produced by International Rectifier Corp.

For more information, contact HVCA in New Jersey at (732) 938-4499 or CKE in Pennsylvania at (724)-479-3533, or visit www.hvca.com.

AR-15 II Transforms Input Voltages to 120 V

The AR-15 II voltage regulator and power conditioner from Furman Sound offers 120 volts of AC power that protects equipment from voltage irregularities. The unit converts input voltages from 97 V to 137 V and transforms it to a constant 120 V. Additionally, the AR-15 II filters and purifies AC power, which the company says reduces line noise and ensures optimum performance. Voltages beyond that range also will be converted to usable levels, depending on the range variance.

The AR-15's circuitry monitors the incoming live voltage with each cycle, comparing it to a precise voltage reference, accurate to +/- .15 percent. If a voltage fluctuation requires a different tap be selected, the new tap is switched electronically at the zero crossing to avoid distorting the AC waveform. Furman says most voltage regulators switch taps at uncontrolled times, which creates voltage spikes and clicks that can leak into the audio.



The rack-mountable unit has eight outlets on the rear panel and one on the front. Outlets are regulated, spike-suppressed and filtered. There are no controls except for the on-off switch. A bar graph meter comprising 10 LEDs indicates input voltage, while another LED indicates In Regulation status, i.e., that the output voltage is within +/- 5 V to 120 V.

For more information, contact Furman Sound in California at (877) 486-4738 or visit www.furmansound.com.

Big Pipe LT Data Capacity Starts at 10 Mbps

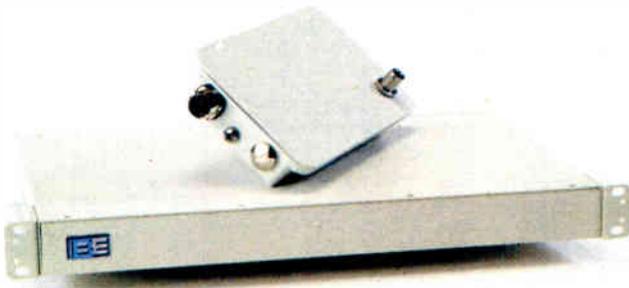
Broadcast Electronics says its Big Pipe LT broadband STL series starts at a price point comparable to 950 MHz composite STLs, but has a data capacity starting at 10 Mbps for transporting AES and analog audio as well as multiple channels of HD Radio audio and data.

The company says Big Pipe LT has been optimized for point-to-point connectivity, offering interchanges of uncompressed analog and digital audio, HD Radio data, Ethernet, serial data and telephony via a wireless or terrestrial path. Big Pipe LT transports main channel audio at a 32, 44.1 or 48 kHz sampling rate, plus several channels of HD Radio coded for audio for HD multicasting, as well as channels of advanced data services, while providing Ethernet connectivity and RS-232 serial data to the studio or remote site.

Additionally, the company says Big Pipe's bi-directional link eliminates the need for separate telemetry, communications and RPU backhaul links.

Big Pipe LT offers base broadband connectivity scalable up to 45 Mbps. Big Pipe transport systems operate in the license-free 5.3 GHz band for reaching up to seven miles point-to-point or in the 5.8 GHz ISM band for reaching up to 40 miles point-to-point.

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



Bext Combiners Free Up Tower Real Estate

Bext Inc. supplies RF filters and combiners to the FM broadcast industry. RF combiners allow two or more co-located stations to use a single antenna.

The company says consolidating stations into a single antenna yields advantages, and that when two or more FM transmitters are operating into two or more nearby separate antennas, filtering becomes necessary to minimize RF intermodulation products. A combiner has inherent filtering of its own so additional filters are unnecessary in most cases, according to Bext.

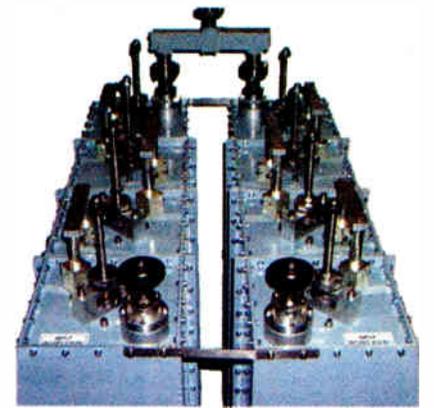
The company adds that having a single antenna allows for better RF radiation, and that the more antennas are on the same tower, the more they cause pattern distortions to each other. Having only one antenna allows for optimum radiation for all stations using it, according to Bext.

Station managers may like combiners because less real estate on the tower is used. Additionally, having only one antenna decreases windloading.

The company says the freed up space and budget that would have been used for multiple antennas can be used to add a common backup antenna, which can be installed lower on the tower than the main common backup antenna, thus not distorting the pattern of each other.

Bext's broadband antennas are on the entire FM band. Combiners are available from a few hundred watts to hundred thousand watts power rating. There is no limit to the number of frequencies that can be combined as long as they are at least 800 kHz apart (spacing closer than that on request). Customers also have a choice of Star Point combiners or Constant Impedance combiners, and can specify the type of input/output connectors at the time of ordering.

For more information, including pricing, contact Bext Inc. in California at (888) BEXT-INC (239-8462) or visit www.bext.com.



Bext Combiner

Now Available in a Digital Edition!

Radio World
 You Asked for It and We Listened —

The industry's top newspaper for radio managers and engineers can now be delivered right to your desktop — no matter where you are.

Digital subscribers get all the same great features of the print edition and then some, with links to manufacturer Web sites and rich media content. You'll receive an email notification when the issue is ready to view: Just click on the link provided and it's all right there in your browser. Read the issue on line or print out the pages — it's your choice!

To sign up for your FREE digital subscription, simply go to www.radioworld.com/subscribe and fill out the form.*

* Signing up for the digital edition of Radio World in no way affects your subscription to the print edition.

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

AcousticsFirst™
Toll-Free Number: **888-765-2900**

Full product line for sound control & noise elimination.

www.acousticsfirst.com

ANTENNAS/ TOWERS/CABLES

WANT TO SELL

AM Ground Systems

Reliable, On-time Installation
Quality Workmanship
Ground System Evaluation
and Repair

www.amgroundsystems.com
1-877-766-2999

Fifty-foot transmission bridge in excellent condition - like new. Perfect for a large tower project. Call Greg at 334-714-6556

FCC COMPLIANCE
TOWER SIGNS
AM & FM Tower Signs
ASR-Tower Registration
Standard & Custom signs

Guy Wire Protectors - Ant. Tags

ANTENNA ID PRODUCTS
antennaid@msn.com
Free Catalog
610-458-8418
www.antennaid.com

ERI FMC-10, 10-Bay high power roto-tiller tuned to 104.9 MHz with mounting. \$3500 Call Bruce Campbell 325-370-8722

AUTOMATION EQUIPMENT

WANT TO SELL

Now available, radio automation for the Linux operating system. Schedule music, voice track, create shells, auto or announcer assist mode, set intro and ending cues, hit the vocal every time with your voice tracks, execute exact time events, join networks, and more. The software is free, there is a small duplication fee. For more info call 406.665.1832.

COMPLETE FACILITIES

WANT TO SELL

**NEW OR USED
COMPLETE PACKAGES**

STUDIO/STL/TRANSMITTER
/ANTENNA OR ANY
COMBINATION OF ABOVE.
-LEASE OPTIONS-
-EMERGENCY RENTALS-
-REMOTE BROADCAST
RENTALS-

SCMS, Inc. (800) 438-6040
"You Know We Know Radio"

LIMITERS/AUDIO PROCESSING

WANT TO BUY

CBS 450 Dynamic Presence Equalizer - call Mark 218-829-1326 or tek1@mwpersons.com

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.

MISC

ROTOR BLOWERS AND PLATE BLOWERS, new & rebuilt for Elcom, Harris, CCA, CSI, McMartin, Goodrich Ent. 11435 Manderson St. Omaha, NE 68164 402 493 1886 FAX 402 493 6821

1999 Ford E250 RadioVan W/ Thunder Truck Broadcasting Equipment Asking: \$ 25,000 Call: 800-467-0690 Email: briantedeschi@rtrservices.com

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.

MONITORS

WANT TO SELL

3 Sootmaster Cart playback machines, 1 Tapecaster 600P, 2 Tapecasters 700P 1 Tapecaster 700 RP, 1 Audiocord stereo RP, 1 ITT Player/splice finer, Make offer individually or for the lot: JB Crawley, 270-465-8884 or 270-465-5762

NEED DONATION

Non-profit radio station/organization seeks donations of radio equipment. We specifically need a console, a P3 or higher computer, studio and field microphones, mic processor, studio monitors, CD players, a hard-drive based field recorder and a telephone audio interface. Email: ColinCruz@TheBlast.FM

REMOTE/ MICROWAVE

WE RENT FOR LESS

Blueboxes	FM Exciters
Zephyrs	FM Power Amps
POTS Codexes	STL's
RF/Audio Gear	Test Equipment

If we don't have it, we will get it!
SCMS, INC. (800) 438-6040
"You Know We Know Radio"

STATIONS

WANT TO SELL

OWN YOUR OWN!! Exclusive Cash Cow Combo less than 100 miles from Atlanta with One of A Kind Revenue Stream. Hurry! This one won't last long! RETIRE DOWN SOUTH-CALL DAVE HEDRICK-256-613-2630

REDDING, CALIFORNIA-100KW CP Operating C3 station, 140k/yr.revenue, newly granted C1 in Arbitron rated market. Run C3 in ski resort area while you upgrade. Price: \$1.5m Contact: Dennis 530-926-1332 web: www.zchannelradio.com/kzro4sale_web.htm

www.radioworld.com

STUDIO- TRANSMITTER LINKS (STL) AND RPU

WANT TO SELL

Two Marti STL-8 units. Good Condition. One on 946.875 Mhz, other 947.125 Mhz. Also have Combiner for Stereo. \$900 per set or \$1800 for both set with the combiner. Call Carl Haynes 601-573-2445

TAPES/CARTS/ REELS/CDs

WANT TO BUY

Large or small collections of 16" transcriptions or 12" transcriptions, not commercial LPs. Bill Cook, 719-687-6357.

TRANSMITTERS/ EXCITERS/ TRANSLATORS

WANT TO SELL

RF Specialties of Missouri - Used Transmitter Harris DX-25U Digital AM Transmitter 7-Yrs Old 1160-kHz - Like New - Chris 800-467-7373

**OFF THE AIR?
Emergency Back-up Rentals**

FM Exciters - STLs -
FM Pwr Amps - Antennas -
Studio & Test Equipment

SCMS Inc (800) 438-6040
"You Know We Know Radio"

Concrete Transmitter Buildings-Prefabricated & Delivered Nationwide, Bulletproof, Maintenance Free, 5 Year Warranty, Custom Sizes Available. Call AES Precast Co. at 800.342.3274 or visit our website www.AESPrecast.com

CP for new 5KW AM station at Abilene, Texas, on 1030kHz. DA-2. \$30,000 plus your cost to build. Bruce Campbell (325) 370-8722.

BE FX-30. Excellent Condition. Currently operating \$950/Best offer. Patrick Lopeman WMOM, Ludington, MI 49431 231-845-9666

CCA 5000D FM On-air Main Transmitter. CSI 5000E 5kw FM. Good for Parts. \$5000 for the pair. Patrick Lopeman WMOM, Ludington, MI 49431 231-845-9666

Collins 830 E/F 10 kw AM transmitter. Good for parts. Transformers, chokes, meter, \$1000,00 as is. Patrick Lopeman WMOM, Ludington, MI 49431 231-845-9666

Free transmitter-Sparta 701B-1Kw-AM transmitter. Works and looks good - must move! Free to a good home. Contact Linda, KDLS, Perry, Iowa at 515-465-5357

1989 Wilkinson 2500B AM transmitter. 2.5 Kw. Numerous spare parts, tubes (still in box) and manuals included. Tuned to 690 kHz. Already set up for 2,000 watts day and 500 watts night. Excellent cond. \$4,000. You pick up. Curt 304-538-6062.

Bext Model FR 1000 solid-state FM transmitter. This needs repair on the final output and will only make 25%. Will let go "as is" for \$2500.00 plus S&H. Email mraley@bbradio.org for pictures and information. Exciter not included.

Commercial Band Translators in Florida, California and Nevada...call Bill Lacy 561-912-9002

QEI Quantum 3.5 tuned to 91.7FM in Decatur, AL. Installed in 1995 configured for 220 VAC single phase. Good condition but the combiner had a heating problem on it and it will only make 2.5k. This is disconnected and ready for immediate pickup. Quantum 300 exciter is included. Will let go "as is" for \$2995.00. Buyer will be responsible for pick-up and delivery. Exciter not included Please e-mail mraley@bbradio.org or call Mike at (704) 523-5555. Visit www.bbradio.org/sale

Three Phase CSI FM12000E tuned to 90.7 FM in Summerville, SC. Installed at 1984 but is running at full power. Buyer will need to remove transmitter when replacement is installed mid August. Exciter not included Price \$2100.00 "as is". E-mail mraley@bbradio.org or call Mike at (704) 523-5555. Visit www.bbradio.org/sale

Three Phase CSI T-20-F1 tuned to 99.7FM in Charlotte, NC. Installed at 1987 and running at full power before being replaced. Transmitter is located in Charlotte, NC and is ready to ship. No exciter is included.. Price \$2300.00 "as is". E-mail mraley@bbradio.org or call Mike at (704) 523-5555. Visit www.bbradio.org/sale

VSoft COMMUNICATIONS
R.F. Communications Software and Engineering Consulting

The Leader in Broadcast Engineering Software

Professional Software packages for FCC applications and predicting coverage.

- Create stunning "real-world" coverage maps and interference studies using Longley-Rice, PTP, FCC, ITU-R P.1546-1, and Okamura/Hata with Probe 3™
- Search for FM channels under spacings and contour to contour protection using FMCommander™
- Prepare AM skywave and groundwave allocation studies and map FCC contours with AM-Pro™
- Plot STL paths over 3D terrain with Terrain-3D™

Quality custom mapping and FCC engineering consulting available.
www.v-soft.com (800)743-3684

Used QEI FMQ 10000 in fair condition. This is a three-phase transmitter with a bad IPA and combiner that will only make 80% power. Willing to let this 12-year-old transmitter go for \$3950.00 but buyer must arrange pick up and shipping from Ashland, VA. Contact Mike Raley at (704) 523-5555 or e-mail mraley@bbradio.org for more information. Serial number is ST10KW054.

FM Translator at 104.5 - Manchester, KY Call Joey Kesler 606-843-9999

WANT TO BUY

Need complete set of HARRIS MW-1, AM, modules. This is for a circa 1978 or 1979 transmitter. Please contact Eric @ 717-243-1200 from 9 am until 5 PM or E-mail wioo@pa.net

Harris MW1 - working PA modules or complete transmitter. Call Kevin 573-756-6476

AM Phasors, Phasor Parts, Phase Monitors, Rf Switches, AM Transmitters. Continental Communications 314-664-4497, Contcomm@Sbcglobal.net

Visit our Website: www.radioworld.com

TRANSCOM CORPORATION

Serving the Broadcast Industry Since 1978

Transmitters and Broadcast Equipment for Radio & Television

Used FM Transmitters

1.5 KW	1983
2 KW	1999
3.5 KW	1986
5 KW	1987
7-IBOC	2005
10 KW	1996
10 KW	2005
10 KW	2001
20 KW	1985
20 KW	1989
25 KW	1980
30 KW	1991
30 KW	1997
50 KW	1982

Used AM Transmitters

1 KW	1980
1 KW	1999
5 KW	1996
5 KW	1974
5 KW	1982
5 KW	1987
10 KW	1985
10 KW	2000
50 KW	1985

BE FM 1.5A
Crown FM2000A
Harris HT 3.5
Harris FM5K1
Harris Z16 HD
Harris HT10 CD
Harris Z10 CD
Henry 10,000D-95
Harris FM20K
QEI FMQ 20,000B
CSI-T-25-FA (Amp Only)
BE FM30B
BE FM30T
Harris Combiner w/auto exciter-transmitter switcher

Exciters

Used Continental 802A Exciter
"New" 20w & 30W Synthesized exciters

New TV Transmitters- Analog and Digital
OMB & Technalogix
VHF and UHF TV Antennas
(10 W to 10 KW) TV STL

Used TV Transmitters

1 KW UHF Axcerra 832A, CH 28
5 KW UHF Harris Diamond CD Solid State
55 KW UHF GE TT59B, CH 25
55 KW UHF RCA TTU-55B, CH 25

Used Misc. Equipment

Orban 8200 Optimod
Bird RF Thru-line Wattmeter, 50S
Patch Panel, 3 Port, 1-5/8"
Denon 720R cassette NEW
Potomac Phase Monitor 1901 Digital 2 Twr
Sola Voltage Reg. 60hz 1 KVA s-phase

Please visit our website for current listings.

800-441-8454 • 215-938-7304 • FAX: +1-215-938-7361

www.fmamtv.com • E-mail: transcom@fmamtv.com
RETUNING & TESTING AVAILABLE • CALL US FOR A QUOTE!

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 AFCEE*

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 AFCEE

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

Mullancy Engineering, Inc.
Member AFCEE

Serving Broadcasters Since 1948

9049 Shady Grove Court
Gaithersburg, MD 20877
(301) 921-0115
Fax (301) 590-9757
mullancy@mullengr.com

GRAHAM BROCK, INC.

BROADCAST TECHNICAL CONSULTANTS

Full Service From Allocation to Operation AM/FM/TV/ATX 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

RADIO SOFT

Visit us on the web at www.radiosoft.com
101 Demorest Sq., #E, Demorest GA 30601-7524

The Coverage Map Store

REALcoverage.com

High Performance Engineering for Maximum Coverage

Structural Analysis

ERI

Electronics Research, Inc.
7777 Gardner Road
Chandler, IN 47610
(812) 925-6000
www.ERInc.com

REGISTERED PROFESSIONAL ENGINEERS
STRUCTURAL ANALYSIS
ERI Incorporated 1943
TOWER REINFORCING

Doug Vernier
Telecommunication Consultants

Broadcast Engineering Consulting
AM/FM/TV/LPTV/DTV
Custom mapping service
Frequency searches
Propagation prediction
FCC application preparation

VSoft
Software for your PC

(800) 743-3684
www.v-soft.com

Reach Broadcast Professionals!

For more information, including rates & deadlines, fax Claudia Van Veen at +1-703-998-7600 ext. 154.

advertise

MISCONCEPTIONS ABOUT TOWERS & RF, Page 24
Clear Channel Reads A WeeSideStory
IBDC Power Levels
July 19, 2006

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

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.

Are you currently a subscriber to Radio World?
 Yes No

Please print and include all information: 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, ext. 154 • Fax: 703-671-7409 • E-mail: cvanveen@imaspub.com

Radio World

5827 Columbia Pike, 3rd Floor Falls Church, VA 22041
PHONE: 703-998-7600 • FAX: 703-671-7409

Classified Advertising Rates Effective January 1, 2007

	1x	6x	13x	26x	32x
1-9 col inch (per inch)	\$110	105	100	95	90
10-19 col inch (per inch)	\$95	85	75	65	60
Distributor Directory	\$135	130	125	120	115
Professional Card	\$105	100	95	90	85
Station/Studio Services	\$200	170	145	123	105
Classified Line Ad	\$2/word				
radioworld.com Line ad	\$2/word				
Blind Box Ad	\$16 additional				

Call Claudia Van Veen, at 703-998-7600 ext. 154 or e-mail: cvanveen@imaspub.com to reserve space in the next issue. Use your credit card to pay, we now accept VISA, MASTERCARD and American Express.

www.radioworld.com



NEW

ECONCO NEW TUBES

New tubes are now manufactured by **ECONCO** at our award winning facility in Woodland California! Of course, we continue our 34 year tradition of high quality power tube rebuilding.

TEL: 800-532-6626
 INTL: +1-530-662-7553
 FAX: +1-530-666-7760
 www.econco.com
 SE HABLA ESPAÑOL



TUBES & COMPONENTS



RF PARTS™ CO.
 Se Habla Español We Export

EIMAC • TAYLOR • SVETLANA
 New & Rebuilt Tubes - Same Day Shipping
 Motorola • Toshiba • SGS • Thomson & Mitsubishi Semiconductors
 800-737-2787 760-744-0700
 rfp@rfparts.com www.rfparts.com

FOR THE BEST PRICE
 & 24 Hr service on transmitting tubes & sockets/parts, new & rebuilt call Goodrich Ent. at 402-493-1886 day or night, www.goodrichenterprises.com.

BEST

FROM THE TALL
TO THE SMALL

www.best.com
619-239-8462

Transmitters
and Antennas





D And C Electronics

An International Distributor of RF Components
Tubes
 NEW & REBUILT

TRANSMITTERS, STUDIO EQUIPMENT, STLS, ANTENNAS,
 RADIO DATA SYSTEM (FOR CAR RADIO DISPLAY)
 EXCITERS-TRANSMITTERS, TRANSLATORS, MIXERS-CONSOLES, RADIO LINK
 RPU, MOSFETS, VACUUM CAPACITORS, SOCKETS




Pro-Tek®

SVETLANA



EEV

BROADCASTING USA DISTRIBUTOR

BEST PRICES

To Order:
1-800-881-2374
Outside U.S. (352) 688-2374
Se Habla Español

FROM OUR STOCK

3089 Deltona Blvd.
Spring Hill, FL 34609

BEST SERVICE

352-688-2374
Fax 352-683-9595

Website: www.dandcelectronics.com

RangeMaster Transmitters

LPAM AM band radio station

919-367-0607

License free with 1-2 mile range! Great Sound!
www.am100rangemaster.com

PROMOTE YOUR BUSINESS!

ADVERTISE!

For more information,
call Claudia Van Veen
at 703.998.7600, ext. 154.

Q: How do I advertise in Radio World?



H	E	A	T	H	E	R	N	S	E	H	C		
T	O	C	O	L	L	I	N	S	E	H	C		
A	D	V	E	R	T	I	S	E	G	U	Q	E	L
K	A	T	H	Y	N	A	P	O	Y	U	R	A	
T	V	S	E	J	A	T	H	E	J	I	E	S	
C	A	L	L	X	C	D	J	A	Y	S	P	A	S
A	T	A	C	L	H	E	M	A	I				
M	D	A	H	A	A	N	J	C	E	N	F		
E	A	S	D	A	U	D	A	O	T	N	G	I	
R	S	N	D	S	D	I	L	I	T	E	E		
A	A	D	S	G	I	D	V	D	L	O	L	D	
S	A	N	T	E	A	N	A	U	E	N	G	A	S
J	A	C	K	I	U	I	M	A	S	I	M	Y	
C	A	L	L	A	D	V	E	R	T	I	S	E	

A: To advertise, call Claudia at 703-998-7600, ext. 154, or e-mail: cvanveen@imaspub.com.

EMPLOYMENT

HELP WANTED

CHIEF ENGINEER - LIVE IN HAWAII! H Hawaii Media needs experienced Chief Engineer for growing 4-station radio group. Must be knowledgeable in all aspects of FM, AM, computers - audio streaming. Position requires a lot of travel between islands. Send resume to George Hochman gh5512@aol.com or call 808-651-5246.

Run your
employment ad
on our web site
for only
\$2 per word!

Call Claudia
for all the details at
703-998-7600
ext. 154

C.E. position wanted: Experienced with computers, transmitters, H.D. transmitters, automations, digital studios. Robert King, Call: 915-581-2979.

Need a good sports talk show host? I'm looking for a spot in the surrounding eastern KY area - willing to relocate as well. Experience with call-in shows for all sports including NASCAR even high school sports! Tape available. Call Jim Ward at 703-371-5416 or nascar43324@yahoo.com

Bright, hard working, smooth voice. Comfortable with production/computer savvy, board-ops/on-air. Major team player, self-motivated, and good group skills. Willing to relocate. Charles Rhodes 972-264-4361 chas375@aol.com

Energetic broadcaster versed in Several formats, seeking employment in the radio industry. Interested in on-air, news, production, sales and promotions. I'm dependable and get along well with co-workers and the public. Willing to relocate. I know I'll be an asset to your station. Tommy (918) 342-3423 T_random9@sbcglobal.net

Fresh graduate from Broadcasting School with a diverse appreciation for all music. Creative, open minded, energetic and team oriented. I'm Kat and I'm ready to get on-air, share my jokes, free spirit personality and love for the business. Will consider any available position. Willing to relocate. Waiting for your call. Kat (918) 902-1308 Kmmood95@yahoo.com

POSITIONS WANTED

Great voice and mic presence makes this young broadcasting grad a stand out. Interested in on-air, news and production. Reliable with a can-do attitude. Absolute Lance is ready to achieve greatness with your station. (918) 770-6953 absolutelance@cox.net

I recently graduated from broadcasting school and I'm anxious to start working in radio. I can handle any format, operate a tight board, and do creative production. I'm reliable and a hard worker. Thomas (918) 832-8402

Multi-talented artist with voice like honey; skilled in editing, copywriting, proofreading; produces VO's, CAS, PSAs, from home studio. Ready to make your business a magnet for increase, excellence. Debra (918) 621-1114 nclm_debra@yahoo.com

On-air talent with exceptional work ethic. Dependable, energetic, punctual, and very personable. Looking for On-Air/behind scenes. Will relocate. Randy 817-293-2004 whoagee@aol.com

Recent radio school graduate seeking position on-air or in sales. Spontaneous personality. Work well with co-workers and the public. Good board ops and production. Eric (918) 249-1791 ericlopez247@hotmail.com

Smooth and very energetic voice for sports broadcasting. Knowledgeable about most sports. Interested in play-by-play, color commentator, or sports production and producing. Call or email for a CD Demo. Kevin (918) 853-7363 thekileteam@yahoo.com

Friendly, Eager to work, ISCERT Certified, Commercial FCC License with radar, NABER Certified two-way radio technician, amateur radio extra, seeks CE, asst. CE F/T, P/T Contract. AM/FM, Cable, TV. Contact: Mitchell Rakoff, mitchellrakoff@yahoo.com 718-969-5224

Buying used equipment?
Selling used equipment?

YOU'RE IN
THE RIGHT
PLACE!

Radio World

Broadcast Equipment
Exchange

For more information,
call Claudia Van Veen at
703-998-7600 ext. 154

Reach Broadcast Professionals! To advertise e-mail cvanveen@imaspub.com

◆ READER'S FORUM ◆

Ernie and DeLores

That was a very nice piece in the last issue; thank you ("Best of Luck, Ernie and DeLores," Nov. 8).



Ernie and DeLores Ankele flank Jay Brentlinger.

Please be aware that Ernie and DeLores Ankele are on retainer for three years here at Autogram/CRL and will attend many trade shows in this period of time.

Your readers will see them for years to come.

David Rusch
Orban/CRL
Tempe, Ariz.

'A Common-Sense Approach'

Thank you for running Craig Baker's refreshing and humorous piece ("Your Ads Should Attract, Engage and Persuade," Oct. 11). It's great to see an owner/manager use a common-sense approach to running his station in these over-analyzed consultant-saturated radio "daze." The best radio in my experience is still local radio.

I look forward to each issue of Radio World. Keep up the good work.

Peter E. Bunch
President
Spoken Word Images Inc.
Greensboro, N.C.

How to ...

Send a letter to the editor:
E-mail radioworld@imaspub.com with "Letter to the Editor" in the subject field.

Change your mailing address:
Visit www.radioworld.com, click on Subscribe to RW and follow instructions to change a subscription address.

Contribute freelance articles:
E-mail radioworld@imaspub.com and request our Writer's Guidelines.

Get information about advertising:
Download a media kit including editorial calendar at www.imaspub.com.

Run a Help Wanted ad:
E-mail Claudia Van Veen at cvanveen@imaspub.com or call 703-998-7600 x154 for print and online rates.

Purchase reprints of articles:
E-mail Emmily Wilson at ewilson@imaspub.com.

Listenership Yields Money

I am responding to Pete Simon (Reader's Forum, Oct. 25). Mr. Simon posits that the reason Air America failed is that it aired only on AM stations with poor signals, while conservative talkers like Rush Limbaugh have comfortable homes on 50 kW blowtorches.

Mr. Simon, with all due respect, is looking at this backward. Limbaugh and other highly rated shows earned their positions on these powerful stations after

Air America was heard on lesser facilities because those are the only stations that would carry it.

starting out and succeeding wildly on a handful of smaller stations. It's all about listenership, which leads to money.

Air America was heard on lesser facilities because those are the only stations that would carry the network. It isn't about liberal vs. conservative. Programmers and general managers always act in their own best interest. The shows that are more highly rated migrate to more numerous and more desirable outlets.

Ken Deutsch
Toledo, Ohio

The author is a contributor to RW. Opinions are his own.

Fessenden

James O'Neal's article on Fessenden and the fact his legendary first broadcast may not have happened is first-rate ("Fessenden: World's First Broadcaster?," Oct. 25).

I have not researched Fessenden to the level O'Neal has, but I have done some basic background work while writing a brief article about the "Fessenden Festival" in Marshfield this past summer. I too have found it odd there were no news articles of the day about the feat.

I certainly applaud you for taking all that time and effort. Wonderful investigation. You have a different take on his personality than what his biographers have written.

Prof. Len Arminio
Coordinator of Broadcast Journalism
Loyalist College
Ontario, Canada

A wonderful article, and an immense amount of research. Congratulations to James O'Neal, and to Radio World for publishing this very significant piece.

Robert E. Richer
Farmington, Conn.

More Fessenden Letters on page 46

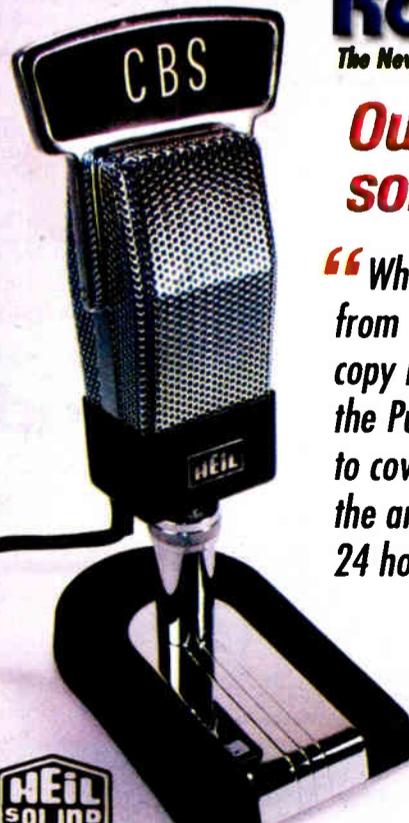
ADVERTISER INDEX

This listing is provided for the convenience of our readers. Radio World assumes no liability for inaccuracy.

PAGE	ADVERTISER	WEB SITE URL
39	AEQ, SA	www.aeqbroadcast.com
22	Altronic Research	www.altronic.com
20	ATI	www.atiaudio.com
5	Audemat-Aztec Inc	www.audemat-aztec.com
14	AudioScience Inc.	www.audioscience.com
9	Axia - A Telos Company	www.axiaaudio.com
15	Axia - A Telos Company	www.axiaaudio.com
3	Broadcast Depot	www.broadcastdepot.com
11	Broadcast Electronics	www.bdcast.com
21	Broadcast Electronics	www.bdcast.com
19	BSW	www.bswusa.com
4	Burk Technology	www.burk.com
38	Circuit Werkes	www.circuitwerkes.com
16	Cke/Hvca	www.rectifiers.com
7	Comrex Corporation	www.comrex.com
1	Continental Electronics Corp.	www.contelec.com
38	Cortana	www.cortanacorporation.com
29	Crown Broadcast IREC	www.crownbroadcast.com
33	Dielectric Communications	www.dielectric.com
18	Digigram Inc.	www.digigram.com
27	dMarc Networks	www.dmarc.net
30	Electronics Research, Inc.	www.eriinc.com
40	Gorman Redlich Mfg	www.gorman-redlich.com
34	Grace Broadcast Sales	www.gracebroadcast.com
23	Harris Corporation	www.broadcast.harris.com
25	Heil Sound, Ltd.	www.heilsound.com
10	Inovonics Inc	www.inovon.com
24	Jennings Corp	www.jenningstech.com
37	Kintronic Labs Inc	www.kintronic.com
38	LBA Technology, Inc.	www.lbagroup.com
6	Logitek	www.logitekaudio.com
34	Mouser Electronics	www.mouser.com
38	Neogroupe	www.neogroupe.com
17	Omnia - A Telos Company	www.omniaaudio.com
38	Omnirax	www.omnirax.com
23	Orban	www.orban.com
38	Radio Design Labs	www.rdl.net
31	Radio Systems Inc	www.radiosystems.com
35	RF Specialties	www.rfspecialties.com
28	SCMS	www.scmsinc.com
26	Sine Systems	www.sinesystems.com
40	Sonifex Ltd.	www.sonifex.co.uk
8	Superior Electric	www.superiorelectric.com
13	Telos Systems - TLS Corp.	www.telos-systems.com
32	Telos Systems - TLS Corp.	www.telos-systems.com
12	ViaRadio Corp	www.viaradio.com
47	Vorsis	www.vorsis.com
2	Wheatstone Corporation	www.wheatstone.com
48	Wheatstone Corporation	www.wheatstone.com



Radio World
The Newspaper for Radio Managers and Engineers



Our readers have something to say

“When you deal with everything from transmitters, studios and the copy machine, to the PC LAN and the Public File, Radio World seems to cover it all. I’m still waiting for the article on how to get more than 24 hours out of the day though!”

Allan A. Augustyn
Director of Network Engineering
Radio Results Network
Escanaba, Mich.

More Fessenden Letters on page 46



Shown: Heil CLASSIC PRO offers a retro look of the '40s with the dynamic sound of today.

◆ READER'S FORUM ◆

Fessenden

I just read your most intriguing and thoroughly researched story. I can add a little about Arthur F. Van Dyck, who is quoted by George H. Clark in 1936.

Van Dyck actually worked for NESCO at Brant Rock in the summer of 1911, testing arc transmitters, and was sent to Peru to demonstrate one of them in the process of obtaining a patent there. So he was in a good position to know what had been done at Brant Rock a few years prior. I have his diaries and snapshots from that period. Van Dyck went on to a career with GE and, after 1922, RCA in its Technical and Test Department, and License Laboratory.

Back in March, Donna Halper asked me if I had any references to the Christmas Eve broadcast. I'm sure James has all the references, but in one of them Fessenden specifically suggests broadcasting, a suggestion that seems to have been overlooked by most everyone since then.

Alan Douglas
Pocasset, Mass.

James, *thank you* for an absolutely great Radio World article on Fessenden, a fellow we generally don't hear much about. Whether he succeeded as the first "broadcaster" or not, his is an interesting story, and you researched it well.

Of course as soon as I finished your piece I went to my library of old radio books to see if there was something that might corroborate Reggie's claim. Couldn't find a mention of him in any of the books I have collected; most of them are early how-to books that deal more with early vacuum tube circuits or even making your own coherer than with the history of the then-new technology of radio.

I did run across one interesting item that I had never seen, in Harper's Wireless Book (1913). Part III of the book is entitled, "Wireless Telephony" and has several chapters covering sound and sound waves in general, but no mention of alternators. They don't credit Poulsen, but maintain that a fellow named Ruhmer invented the "speaking arc," by which he was able to transmit speech several miles in 1902. But for a homebrew radio telephone transmitter, the book suggests placing a carbon mic in series with the aerial lead of a spark coil setup, which I am sure proved a disappointment to all those who tried it.

But the interesting item was a scheme of amplitude-modulating an RF signal developed by a Professor Vanni, which



used a jet of water from a pump: "... two electrodes vibrating with the liquid jet is interposed in the circuit between the aerial and the ground." I have no idea where the RF excitation comes from, but the book suggests that the jet of water does both the RF and modulation. Fascinating "fringe science" reading.

Of course the Father of Broadcasting to some people is "Doc" Harrold, who ran a radio school in San Jose, Calif., and whose broadcasting station eventually became KQW, later KCBS, San Francisco. Doc Harrold used an arc entirely submerged in alcohol, which sounds awfully dangerous to me. But I am determined to try this someday soon, probably out in the street with a fire extinguisher at the ready and a good life insurance policy in place.

Again, many thanks for your great piece in Radio World. I wish it would encourage more articles on radio history, "lest we repeat it."

Jim Wood
President/Chief Engineer
Inovonics Inc.

James E. O'Neal is to be congratulated for the time, effort and dollars he put into researching this article. Very few readers realize how much time and effort it takes to assemble the facts, figures and other information needed to produce such a treatise as was done regarding the work of Reginald Fessenden.

George Riggins
Long Beach, Calif.

I have to send my thanks to James O'Neal and RW Associate Editor Kelly Brooks ("I Want a Fabulous Studio!," Oct. 25), for writing two completely dif-

Rethinking AM's Future

The FM-HD rollout, including HD2, continues to roll along nicely. To date, almost 1,400 FM stations have licensed the Ibiquity standard. The majority of those are on the air; and according to estimates from Ibiquity and the alliance, the number of stations multicasting is near or above 500 (estimates vary).

But what about AM? The story there is quite different.

Only 175 or so AM stations have even licensed AM-HD. For a number of reasons, quite a few have tried it and taken it off the air, or so the anecdotal evidence suggests. (Ibiquity no longer reports in its public summaries whether a station has IBOC on the air.)

Making AM-HD work well as a long-term investment is seen as an expensive and risky challenge for most stations and their owners. With the bulk of successful AMs airing news, talk and sports, the improved fidelity advantage of HD and stereo seem only marginally attractive. There is the significant downside of potential new interference to some of their own AM analog listeners as well as listeners of adjacent-channel stations. And of course we still have no nighttime authority for AM-HD.

What to do? In recent years engineers and others have proposed various ideas that would leave the AM band behind and coax the FCC into creating a new band for AM to which existing stations could migrate — an expanded version of the expanded band, if you will, where stations would be allowed to simulcast on both their old AM channel and their new one for a certain time frame until receivers adequately filled the market.

An attractive choice for such a band is TV Channels 5 and 6, which could be re-engineered to become available after the HD-TV migration is complete. Another idea picks the 25–27 MHz RPU and public service band once used by broadcasters, which has been all but abandoned because of skywave interference and is now overrun by rogue CB operators.

When the FM band moved in 1945 from 42–49 MHz to its 88–108 home, there was plenty of spectrum and public interest to justify creating an expanded new radio band. The idea of noise-free, high-fidelity radio held great promise for adding many stations and formats to better serve consumers. It took a while, but the mission was accomplished.

These conditions hardly exist today. The marketplace is heavy with hi-fi audio entertainment and information delivery systems. FM, satellite, iPods, MP3 players and the Internet have stolen much of AM radio's potential audience. There is no public demand for another radio band to be created to "save" AM and added to the busy array of choices. Only AM stations with limited coverage areas that have lost audience would have any interest in advancing such a proposal.

The VHF TV channels left behind by the HD-TV conversion will be auctioned by the FCC to the highest bidders representing proponents of new technology. The only AM owners who might be capable of competing in such bidding wars would be the very large companies that already have successful AMs. Most are 50 kW full-coverage facilities with larger service areas than their FM sister stations. Given the massive installed base of radios that hear all AM stations, the owners' best interests are served by staying put and eventually migrating to a better IBOC digital solution.

The Canadian DOC reportedly is considering adopting the Ibiquity format for FM but not for AM; Digital Radio Mondiale may be its AM choice. Ibiquity should take a long look at this development and seriously consider incorporating DRM into its AM system to make it more flexible and scalable. DRM could well become a more worthy option for AM stations and their digital future.

Regardless, developments in and around digital radio for AM are raising pressing concerns. Owners and regulators need to look at these questions closely.

— RW

ferent, but equally entertaining articles.

O'Neal's article on Fessenden was a fascinating and unbelievably well researched piece on an historical event with which most of us are familiar. His case for it never having happened just makes it that much more intriguing. I particularly enjoyed the supporting pictures. Looking at the enormous mechanical contraptions used in the very early days makes me wonder how any of it

worked at all!

With regard to Kelly's comments on studio design and décor, I am wondering if Radio World rents her out for consulting design work? Our studio is decorated in Early Jurassic and I'm certain we could use a little feminine touch here and there.

Thanks again for a great issue!

Jim Withers
KSIX(AM)
Corpus Christi, Texas

—EDITORIAL STAFF—

Paul J. McLane	ext. 117	Editor in Chief, U. S.
Leslie Stimson	ext. 129	News Editor/Wash. Bureau Chief
Kelly Brooks	ext. 136	Associate Editor, RW & Production Editor, RWEE
Thomas R. McGinley	—	Technical Adviser
Michael LeClair	—	Technical Editor, RWEE
John Bisset	—	Contributing Editor
Skip Pizzi	—	Contributing Editor
Marguerite Clark	—	Editor (International), Milan
Rogelio Ocampo	ext. 121	Latin America Editor in Chief
Karina Gerardi	ext. 137	Latin America Editor
Peter Finch	—	Editorial Assistant, Milan

—EDITORIAL CONTRIBUTORS—

W.C. Alexander, James Careless, Harry Cole, Mark Durenberger, Charles Fitch, Ty Ford, Scott Fybush, Frank Grundstein, Harold Hallikainen, Craig Johnston, Paul Kaminski, Peter King, Mark Lapidus, Daniel Mansergh, Sharon Rae Pettigrew, Carl Lindemann, Ted Nahil, Tom Osenkowsky, Ken R., Rich Rarey, Tom Ray, Randy Stine, James G. Withers, Travis the VIO Guy, Barry Umansky, Tom Vernon.

Radio World

Vol. 30, No. 32 December 20, 2006

Telephone: (703) 998-7600 • Business Fax: (703) 998-2966 • Editorial Fax: (703) 820-3245
E-mail: radioworld@imaspub.com • Web site: www.radioworld.com

—ADVERTISING SALES REPRESENTATIVES—

US East & Latin America: John Casey	330-342-8361	Fax: 330-342-8362	e-mail: jcasey@imaspub.com
US West & Canada: Dale Tucker	916-721-3410	Fax: 916-729-0810	e-mail: dtucker@imaspub.com
Classified Ads: Claudia Van Veen	703-998-7600 x154	Fax: 703-671-7409	e-mail: cvanveen@imaspub.com
European Sales Mgr., Africa, Middle East: Raffaella Calabrese	+39-02-7030-0310	Fax: +39-02-7030-0211	e-mail: rcalabrese@imaspub.com
Japan: Eiji Yoshikawa	+81-3-3327-2688	Fax: +81-3-3327-3010	e-mail: callems@world.odn.ne.jp
Asia/Pacific: Wengong Wang	+86-755-5785161	Fax: +86-755-5785160	e-mail: wwg@imaschina.com

NEXT ISSUE OF RADIO WORLD JANUARY 3, 2007
NEXT ISSUE OF ENGINEERING EXTRA FEBRUARY 21, 2007

For address changes and subscription renewal, please visit www.rwonline.com and click on "Subscribe to RW." To submit letters or story proposals, to request writer's guidelines, or for other editorial matters, e-mail the editor at radioworld@imaspub.com.

—ADMINISTRATION & PRODUCTION—

Stevan B. Dana	President
Carmel King	Chief Executive Officer
John Casey	Publisher
Marlene Lane	Chief Operating Officer
Chuck Inderrieden	Chief Financial Officer
Eric Trabb	Vice President, Sales
T. Carter Ross	Editorial Director
Davis White	Production Director
Karen Lee	Production Publication Coordinator
Lori Behr	Ad Traffic Manager
Linda Sultan	Classified/Product Showcase Layout
Robert Green	Circulation Manager



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: For reprints call or write Emmily Wilson, P.O. Box 1214, Falls Church, VA 22041; (703) 998-7600; Fax: (703) 998-2966, Copyright 2006 by IMAS Publishing (USA), Inc. All rights reserved.

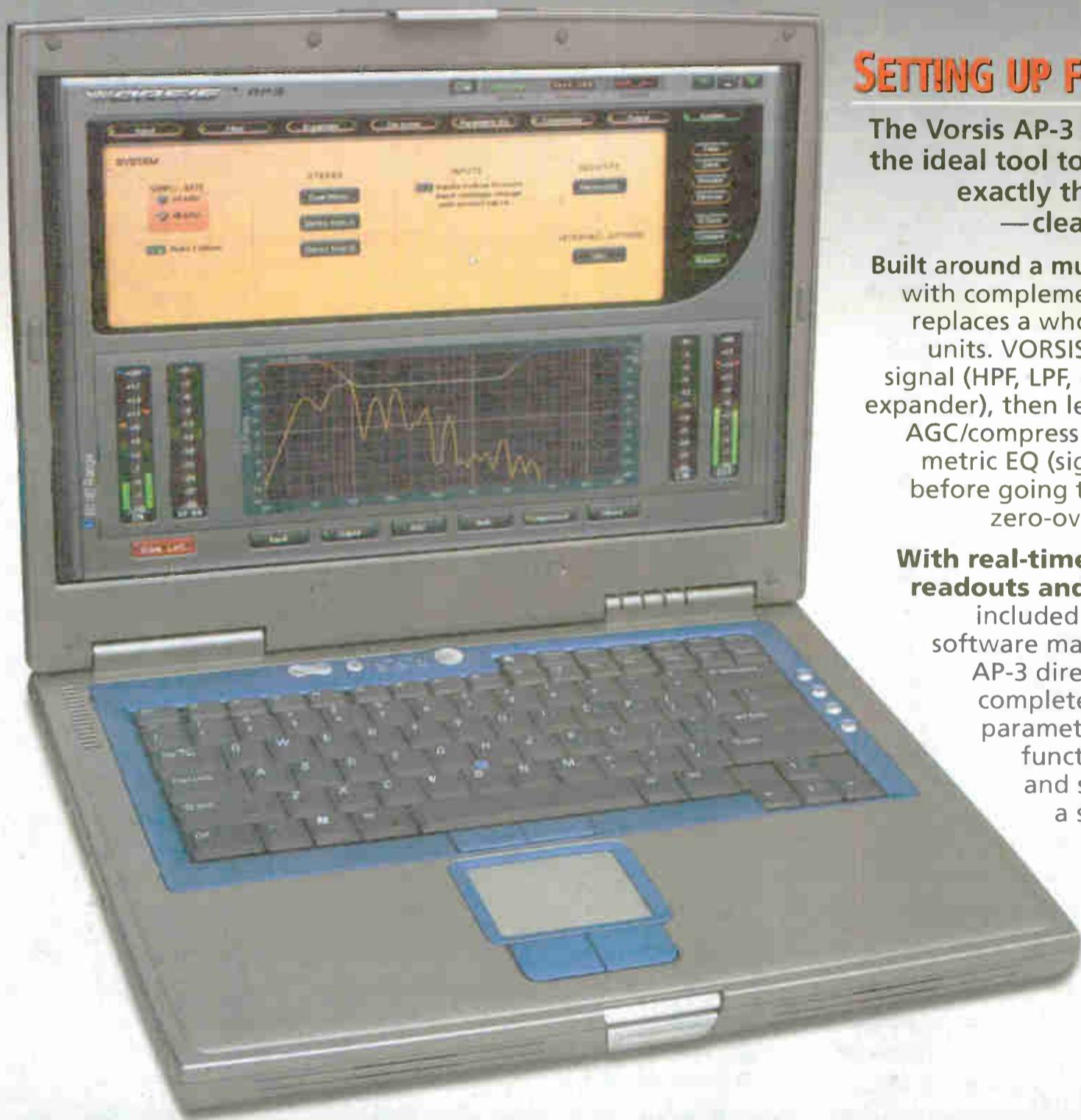
—Printed in the USA—

This Little Unit



Can Do BIG Things!

Our new AP-3 is the perfect HD Processor.



SETTING UP FOR HD RADIO?

The Vorsis AP-3 digital processor is the ideal tool to shape your sound exactly the way you want it — cleanly and efficiently.

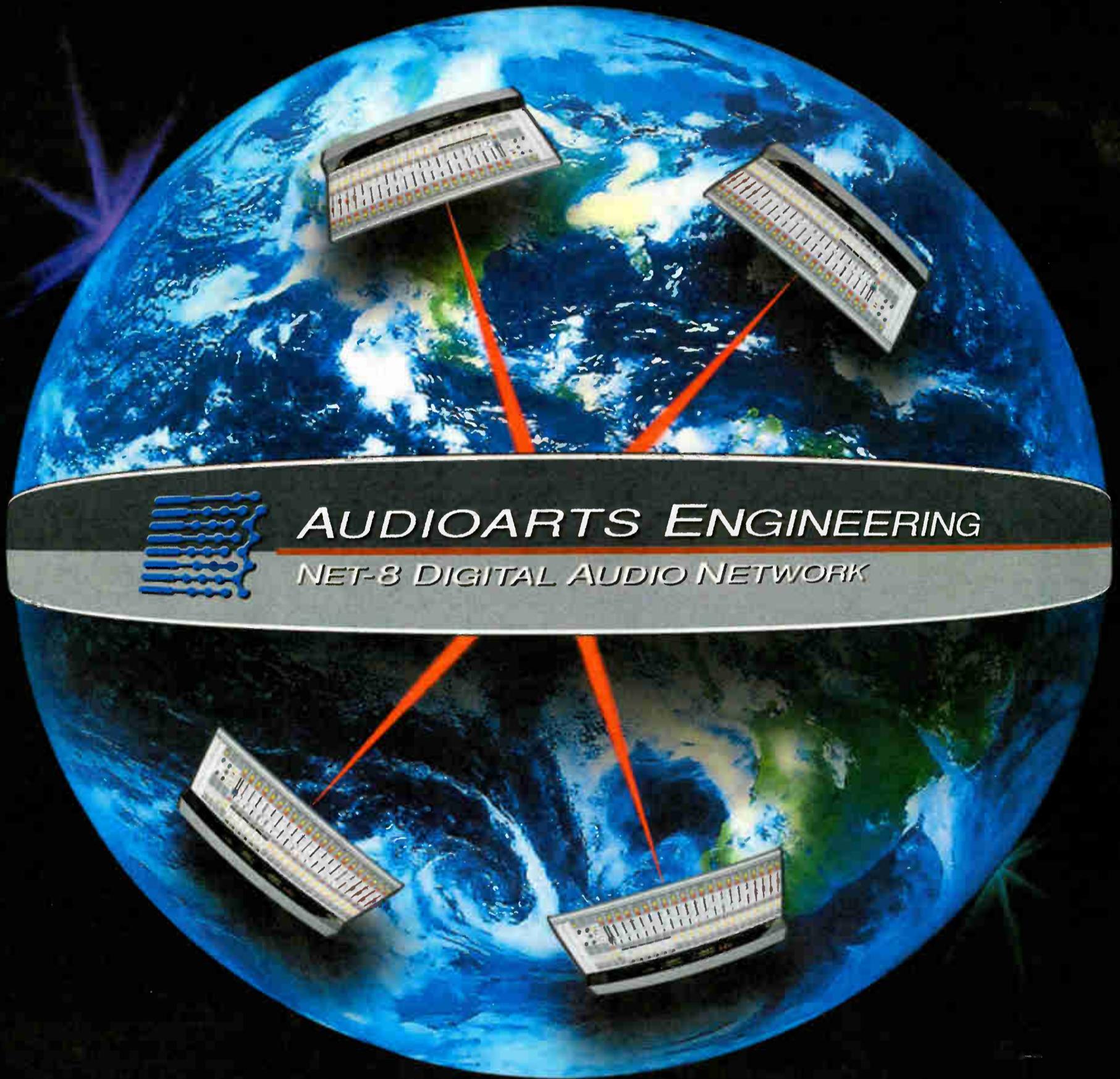
Built around a multi-band compressor with complementary AGC, the AP-3 replaces a whole rack of dedicated units. VORSIS pre-conditions your signal (HPF, LPF, notch filter, de-esser, expander), then let's you apply 3-band AGC/compression and 4-band parametric EQ (signal chain reversible) before going through a final stage zero-overshoot peak limiter.

With real-time spectrum density readouts and full metering, our included PC graphic interface software makes operation of the AP-3 direct and easy, offering complete control of all audio parameters, presets, monitor functions, system settings and security—all through a single RJ-45 ethernet connection that lets you control one or many AP-3 units.

TAILOR THAT SOUND

VORSIS™

It's a Whole New WORLD!



AUDIOARTS NET is the *EASY* way to interface your D-75N digital consoles! And because D-75Ns are also standalone designs each studio can operate *INDEPENDENTLY*, relying on the network only to share resources. And by *EASY* interface we *MEAN* it—you don't have to be a software guru or IT professional to get up and running—and *STAY* running! And because it's *AUDIOARTS*, you can rest assured it'll be reliable and preserve your budget. **TAKE ADVANTAGE** of *WHEATSTONE's* extensive expertise in **DIGITAL TECHNOLOGY!**

 **AUDIOARTS ENGINEERING**

sales@wheatstone.com / tel 252-638-7000 / www.audioarts.net

Copyright © 2006 by Wheatstone Corporation