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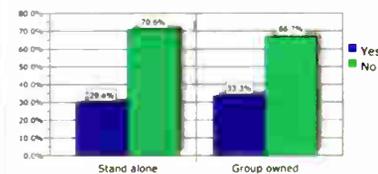
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Respondents who now own an AoIP network: Has latency been a problem for you?



More Boxes Open for Pandora

Carmakers, Consumer Electronics Firms Expand Their In-Dash Internet Offerings

BY LESLIE STIMSON

LAS VEGAS — Not long ago, the big, shiny attention-grabber for radio in new consumer electronics was satellite.

Internet radio is the new darling; and Pandora leads the charge in name recognition among consumer electronics manufacturers and retailers. This was apparent at the 2011 Consumer Electronics Show. Traditional radio almost seemed overlooked amid all the new devices displayed at CES, where buzz categories also included 3D televisions and a constellation of 70 to 80 new tablet PCs.

The Internet radio product category certainly is growing, with particular emphasis on applications that can be used to provide Internet radio connectivity in the car.

IN EVERY CAR?

The day of buying a car that is directly outfitted with Pandora or some other Internet radio music or talk service isn't here yet. But radio engineers and programming experts say that day is coming and that the industry must pay heed.

Executives at Pandora say one of

their goals is to be in every car manufacturer's audio entertainment platform. "We see Pandora as redefining what radio is in a connected world," said Jessica Steel, executive vice president of business and corporate development in a session on car connectivity.

Traditional radio was founded on a

model of one station/one tower broadcasting to many users, she said; satellite followed with a similar delivery pattern, whereas Pandora offers the user music selected specifically for him or her. "We believe this is where radio is going."

Citing consumer interest, more automakers and receiver manufacturers are charging ahead to offer some sort of Internet radio entertainment in vehicles. "The goal is to make sure we're integrat-

(continued on page 8)

LPFM: So What Happens Now?

Predictions Vary on When FCC Will Open Application Window

BY RANDY J. STINE

WASHINGTON — LPFM broadcasting advocates say new rules forthcoming from the FCC will expand low-power radio opportunities and could bring about a long-awaited filing window before the end of 2011.

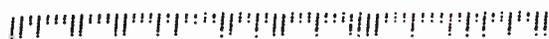
Just how many new FM community licensees will be created is not known; some observers expect thousands of applications. However, some experts predict many fewer will get through the settlement and selection process, be constructed and get on the air.

By the FCC's count there are now 835 LPFMs, mostly in small communities and rural areas. The new rules guiding low-power broadcasting could open up the possibility of some stations in urban centers like Boston or Chicago, some analysts predict, though others say the barrier to entry into the largest markets remains high.

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A technician from Wave Communications installs an antenna at WOCT(LP) in 2005. Engineering consultant Benjamin Evans worked with Oshkosh Community Media Services, a division of the city of Oshkosh, to get its low-power station on the air.



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Selected content from Radio World's "The Leslie Report" by News Editor/Washington Bureau Chief Leslie Stimson.

NEW LPFMS TO HAVE INTERFERENCE REMEDIATION PROCEDURES

In the low-power FM language passed by Congress and signed into law by the president, a couple of noteworthy items merit a closer look.

The interference remediation procedures are interesting. For LPFMs licensed at locations that do not satisfy third-adjacent channel spacing requirements under Section 73.807 of the commission's rules (47 CFR 73.807), the FCC must provide the same interference protections that FM translators and boosters are required to provide as set forth in Section 74.1203.

Up to a year after a new LPFM is built on a third-adjacent channel, it must air periodic announcements alerting listeners that interference that they may be experiencing to a neighboring station could be the result of that LPFM's operation. How often those must air was not specified and is something the commission is going to have to figure out as it changes its rules. The LPFM must instruct affected listeners to contact the station to report any interference.

Congress directed the agency to require all new LPFMs on third-adjacent channels to tell the FCC "and all affected stations on third-adjacent channels" of a complaint of interference by electronic communication within 48 hours, and to cooperate in addressing the interference within the victim station's protected contour.

These LPFMs will be "encouraged to address all other interference complaints," including those made to the FCC about interference to full-service FMs, translators and boosters by the transmitter site of an LPFM on a third-adjacent channel "at any distance" from the full-service FM, translator or booster.

In turn, the FCC is directed to notify the LPFM licensee of interference within seven calendar days after it receives a complaint from a listener or another station.

Regarding remediation, the text reads: "To the extent possible, the Federal Communications Commission shall grant low-power FM stations on third-adjacent channels the technical flexibility to remediate interference through the co-location of the transmission facilities of the low-power FM station and any stations on third-adjacent channels."

The FCC will accept "informal evidence of interference" including any engineering analysis that an affected station

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NEWSROUNDUP

TIS STATIONS: Deadlines were set to comment about the FCC's proposals to change rules governing Travelers Information Service stations, low-power stations in the AM band. Government agencies and some TIS licensees asked the commission to consider expanding the scope of the TIS, which was created in 1977. In its Notice of Proposed Rulemaking, the commission seeks comment on questions such as should TIS stations be able to transmit at higher power levels and in more locations and air information such as NOAA Weather Radio retransmissions and Amber Alerts. Comments to PS Docket No. 09-19 are due Feb. 18 and replies by March 7.

THE ONE: Ludwig Enterprises said its new "The One" radio will be compatible with Apple iPod docking stations. The unit will receive a variety of radio broadcasts transmitted over affiliate broadcast DTV stations. Ludwig plans to cover 50 markets when its network is built out. Ludwig's system is based on patented technology using a "carousel" that interleaves information streams in a repeating pattern for inclusion in a DTV signal.

may commission and accept complaints based on interference to a full-service FM, translator or booster. The definition of "informal evidence" will be interesting; it sounds as if some of this is open to interpretation.

The commission will accept complaints of interference to mobile reception as well.

And to wrap up the interference tidbits, there's a special protection for full-service FMs licensed in "significantly populated" states with more than 3 million people and a density greater than 1,000 people per one square mile land area.

For those areas, the agency will require LPFMs licensed after the bill is enacted and located on third-adjacent, second-adjacent, first-adjacent or co-channels to full-service FMs to follow the same complaint and remediation procedures that translators and boosters must provide to full-service FMs. The rules for those areas come into play regardless of whether the complaints occur within or outside of the protected contour of victim stations.

Finally, the FCC will conduct an economic study on the impact LPFMs will have on full-service commercial FMs and submit a report to Congress no later than a year after the changes are enacted.

So the commission has a little work to do before it opens a new application window for the new LPFMs.

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Catfish Swims in a Bigger Pond

He's Steve Church's Replacement as CEO.
What Should We Expect From Telos Now?

Mike Dosch has definite goals in mind for the four broadcast equipment companies that constitute the Telos family. These include filling out their product lines with more choices and shipping newly developed models more quickly. But, he says, don't expect massive alterations now that he has taken over as chief executive officer.

"What Steve Church has handed me here is a quite successful company, not a company in trouble," Dosch told me. He emphasized that he has in fact been playing the CEO role quietly for some months now.

"I don't have to make a lot of changes and blow things up. I have the pleasure of tweaking and improving. What you've liked about Telos, it's going to continue. What you haven't liked about Telos, we're going to be fixing that. It's been a pretty well-run company."

We reported in Radio World's online NewsBytes in January that Church, who founded the company in 1985 in his kitchen in Cleveland, has stepped aside as CEO of the alliance that has grown to include the Telos, Omnia, Axia and Linear Acoustic businesses. Church remains majority owner; the other owners are Dosch, Frank Foti and Tim Carroll. Those four make up the company's board of directors.

Church indicated he'll remain involved, though he acknowledged he is "passing the baton." (We profiled



Church last spring when he received NAB's Radio Engineering Achievement Award. You can also read his letter about this transition at www.radioworld.com/article/112416.)

"I think Steve wants to get back to his roots a little bit more, to get closer to technology again," Dosch said. "The company is about three times the size it was when I started." Sales are about \$30 million per year, and the firm employs around 100 people; it has headquarters in Cleveland and offices in California as well as Latvia (where Church has a residence), Germany, Ukraine and China.

"You can't really be a part-time design engineer and 'manage a little on the side.' Steve realizes the needs of the business are such that he can't really spend much time with tech and product ideas. My guess is he's going to go and invent something."

Telos and its sister companies have had notable successes such as Zephyr codecs, Omnia processors and Axia IP audio lines. I asked Dosch ("Catfish," to friends and colleagues) where future growth will come from.

For one thing, he thinks Telos can do a better job expanding its offerings within the sectors it serves: phone systems, codecs, radio/TV processors and audio control/routing. "If we're in a category — codecs for example — it makes sense for us to build not just one codec but a

The industry really wants us to build products that do more and cost less.

— Mike Dosch

range of products with different feature sets and price points, so that no matter what a customer's codec needs are, we have something to offer.

"It's not something we've done a terrific job at in the past. We've made products targeted at a certain range of applications or customers, but we could have leveraged our successes more broadly."

To support this reasoning, he points to the success of the Omnia One. The company has sold 5,000 units of this affordable processor in less than three

FROM THE
EDITOR

Paul McLane



years. That, he says, shows that "our brand recognition is good, people value what we do; but we haven't necessarily made products at the lower price points. There's an opportunity there.

"Also, we know the industry itself has been going through hard times, so [broadcasters] are looking to do more and spend less. The days of the \$35,000 on-air console — those are ancient history for most stations. People are asking how they can maximize the money they have. We're engineering products that are lower-priced; we're building overseas in some cases; we're using new technology to provide more features at lower cost; we're building what clients want."

Technology evolves, too, offering opportunities. Sales of ISDN codecs may be waning as those services ramp down; but IP codecs are growing, with an expanding choice of how to connect them. More users are doing remotes via the public Internet. Demand for dedicated point-to-point links also will expand as bandwidth grows thanks to technologies like Multi-Protocol Label Switching to maximize speed.

In routing, where Axia now has IP equipment in about 2,000 studios, Dosch sees ample further opportunity even as manufacturing competition in that sector has intensified. Look as well for Telos to introduce products to help customers stream content to computers and mobile devices. This is a niche where Telos once had a presence with the AudioActive encoder line. Dosch says that effort was "way before its time."

ETHICAL CREATIVITY

Dosch, who turns 49 this year, is a native of California. He studied electrical engineering at San Diego State University and came to Telos in 1999 after having worked at Pacific Research & Engineering, where he started as a design engineer and rose to become chief operating officer.

Pacific was a prestigious brand but the original company fell on difficult times in the 1990s. I asked Dosch why that situation didn't end well for PR&E as a standalone business.

"These are very different companies," he replied. "PR&E was a company that didn't have a very good business strategy. No matter how good the execution was, it was destined to failure. Telos is a different animal and in some ways the opposite. It's always had great strategy and advanced technology; if anything our execution could have been better. It's far

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Photo by Leslie Stinson

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Steps to implement the "Local Community Radio Act," which President Obama signed after its passage by Congress in late 2010, are yet to be spelled out by the FCC in revised LPFM rules.

"The commission will take swift action to open the dial to new low-power radio stations and the valuable service they provide," Chairman Julius Genachowski promised in a statement.

The act requires the commission to conduct an economic survey to study the effects of low-power stations on full-power commercial FMs; that is to be completed by Jan. 4, 2012. The results could affect how the FCC shapes the rules, experts said, and the timeline for introducing them.

An FCC spokesman declined to comment on how quickly the commission would move on the issue.

NO MORE CHAFING?

The agency created the LPFM service in 2000, authorizing noncommercial educational broadcasting with a maximum of 100 watts or less to cover a service radius of approximately 3.5 miles. LPFM stations function under many of the same operational rules as full-service stations but are not protected from interference from full-power stations.

The service's supporters long have chafed over strict spacing limitations. The National Association of Broadcasters had opposed suggestions to relax protection against interference to commercial stations. Previous versions of the recent bill failed to gain enough votes until NAB agreed to the easing of third-adjacent — and, in some cases, second-adjacent — protections.

The association said the new rules will serve to reaffirm the primary status of full-power radio stations. "NAB got everything we were seeking in the legislation, which included primary status for full-power stations and spacing rules to protect full-power stations against interference," said NAB Executive Vice President of Communications Dennis Wharton.

Low-power backers and others said LPFMs had been allocated on the minimum-spacing method, while the new law removes almost all of the restrictions on spacing between LPFMs and third-adjacent-channel stations.

"The law prohibits the FCC from reducing first- and second-adjacent separations, but does allow the commission to grant waivers of second-adjacent spacing when the LPFM applicant can establish that the proposed station will not cause interference," said Harry Cole, a communications attorney with Fletcher, Heald & Hildreth who also

NEWS

writes for Radio World.

The final FCC interpretation of the law will determine actual spacing requirements, experts agreed.

Consultants and broadcast engineers contacted for this story expect the agency will be bombarded with applications for new low-power service once a filing window is introduced. The FCC first must use the Notice of Proposed Rulemaking process to modify existing rules. It can open an LPFM filing window 30 days after publication of new rules in the Federal Register, observers said.

"I would expect there could be as

many as 5,000 to 10,000 filing for new 100-watt low-power service," said B. Benjamin Evans, president of Evans Engineering Solutions.

"Yet, based on past experience, my estimate is that after competing applications go away, about 25 percent or less of the LPFM applicants that remain would get on the air. The reasons for the low execution rate have mostly to do with the non-profit nature of the service and the lack of broadcast experience of the vast majority of applicants."

According to the Prometheus Radio

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COMMUNICATIONS

LPFM

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Project, which advocates for low-power community radio, 3,259 applications for service were submitted in the original filing window in 2000.

Evans, whose firm is based in Thiensville, Wis., conducted numerous LPFM frequency searches for organizations in the first filing window. He is convinced many groups are "chomping at the bit" to file.

"It's been 10 years since applications for new LPFM service have been accepted. There is significant pent-up demand for service."

TRANSLATOR QUESTIONS

Prometheus hopes the new rules will open chunks of spectrum in urban areas that have never had access to community radio. However, most observers say the opportunities in major cities like Chicago, San Francisco and Houston are likely to be very limited.

"The demand is there," said Maggie Avenir, technical & training officer for Prometheus. "We received inquiries from over 300 churches, schools and community groups interested in applying for LPFM licenses in the first two weeks after Congress passed the Local Community Radio Act. The greatest interest appears to be concentrated on the Gulf Coast."

Prometheus, which hasn't helped build new LPFM stations since 2007, says it is working with the FCC to make sure some open channels in major cities are preserved for LPFM service.

"A lot depends on the resolution of the Auction 83 translator applications from 2003. Thousands of applications were filed, over half by 15 organizations. If too many of those applications are granted, many of the best channels in cities will be given to speculators or networks that repeat canned programming rather than to LPFMs that produce local content," Avenir said.

Prometheus is suggesting the commission open an LPFM licensing window before acting on the pending translator applications, in order to gauge demand in local communities.

Meanwhile, 10 radio group owners with a total of 21 pending translator applications from 2003 recently urged the commission to process their translator applications, provided spectrum is available in a community for an LPFM.

Womble Carlyle communications attorney John Garziglia told Radio World these translator applicants want to provide fill-in service or rebroadcast HD2 or signal-deficient AM signals. The group does not include licensees that have built translator networks, such as Educational Media Foundation, which owns and operates the K-Love



Prometheus Radio Project has helped launch low-power stations with 'barn raisings.' Its most recent such event was for a full-power FM in New York's Hudson Valley last September. Volunteers solder audio cables for the WGXC(FM) studio.

and Air 1 networks.

Prometheus the LPFM backer and EMF the translator advocate surprised many in the industry last year by submitting a joint memorandum of agreement. They urged the commission to open an LPFM filing window in which low-power broadcasters would receive preference over translators. They also suggested LPFM stations should be authorized to operate on 87.5, 87.7 and 87.9 MHz.

However, the new legislation spells out that full-service FMs are primary services in terms of spectrum priority, while translators, boosters and LPFMs are equal secondary services.

EMF filed supplemental comments in January, stating that the LPFM bill "does not specifically address the disposition of the Auction No. 83 applications," though it said the act did "dispose of" other issues such as the question of priority. "Thus, the commission must deal with the issue of how to ensure that licenses are available for LPFM stations and FM translators ... while still treating the services as equal."

EMF also wrote that the new law does not preclude the proposals it put forth in its compromise with Prometheus. It did not reply to a request for comment for this story.

'PREPARE'

Now what? Proponents said organizations interested in obtaining LPFM licenses should take steps to prepare for the application window as the FCC navigates its rulemaking process. Prometheus is advising potential applicants to be ready to file by late this year.

Michelle Eyre of REC Networks, a community broadcasting consultant and advocacy group, tells potential LPFM applicants, "At this time, we can not speculate what the new parameters will be

or the timeline of the rulemaking process and subsequent filing window. REC's advice is to prepare. Get your organization established, if it isn't already."

Observers said the economy also could play a role in how many low-power suitors will be interested once a

filing window is established.

"If the economy doesn't improve appreciably, I would not expect a flood of apps. If the filing window were open today I would guess there would be a thousand or so applications," said Jon Kenneke, president of Kenneke Communications LLC.

His firm in Albany, Ore., provides services ranging from license application searches to studio maintenance. He said the low-power stations he has worked with have impressed him with their financial know-how.

"These LPFM broadcasters have introduced me to a novel way to raise and save money. I've been impressed with what they can do on a very small budget." Kenneke predicts the FCC won't open a new window until late 2012.

However, John Broomall, president of Christian Community Broadcasters, also an advocacy and broadcast consulting firm, said he expects the FCC to announce the rules process and open an LPFM filing window before the end of 2011.

"There will be some opportunities for urban stations. However, I expect the vast majority will be allocated to the suburbs and small cities."

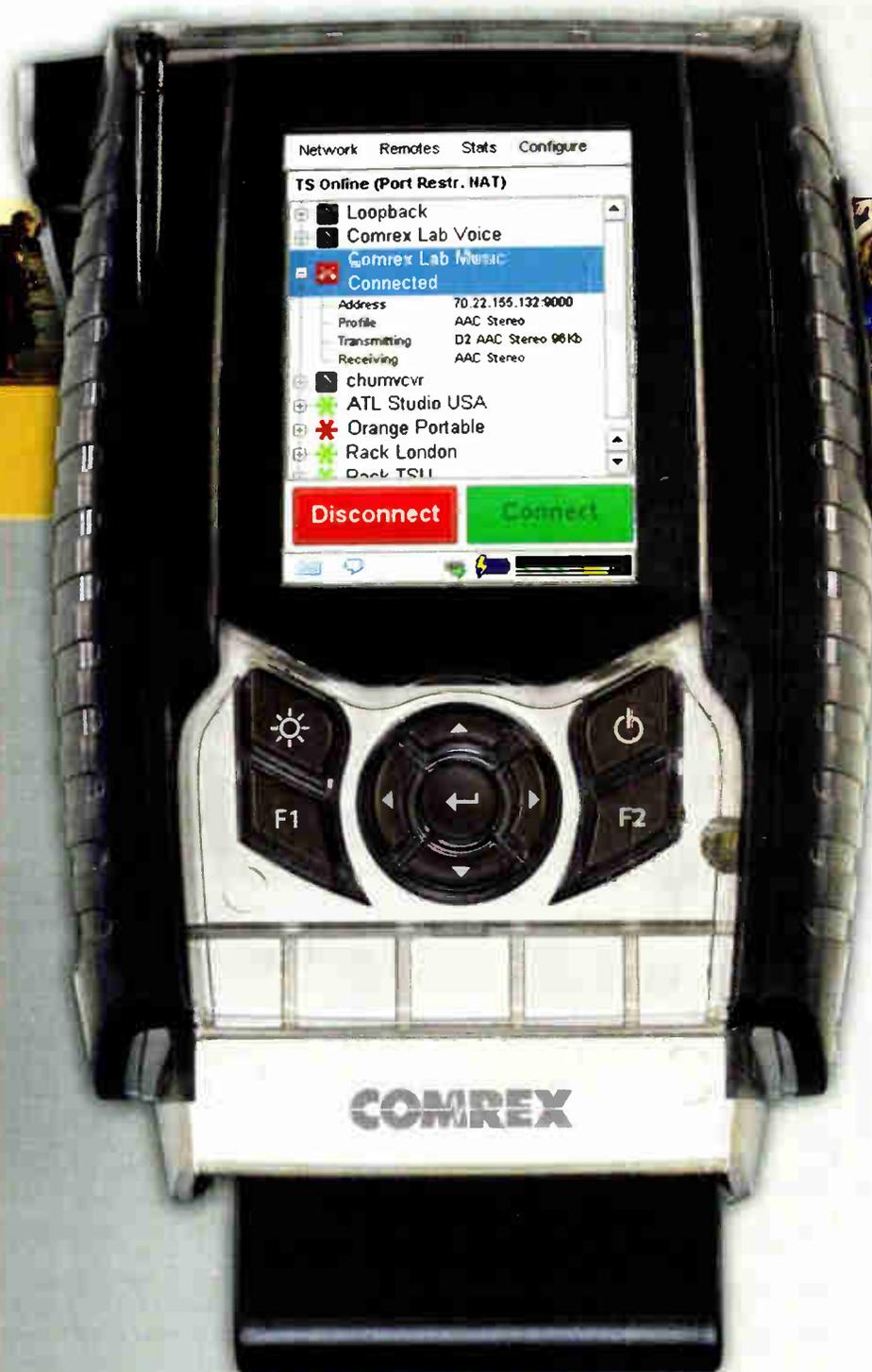
NEWSROUNDUP

BIG STATION SALE: Bonneville International parent Deseret Management Corp., an arm of the Church of Jesus Christ of Latter-day Saints, announced an agreement to sell 17 stations to Hubbard Broadcasting Inc. The companies put the value of the cash deal at \$505 million. Other terms were not disclosed. The deal is subject to FCC approval and other conditions. Bruce Reese, president/CEO of Bonneville, will go to work for Hubbard, as will Drew Horowitz, chief operating officer. Hubbard Radio Division President Virginia "Ginny" Hubbard Morris will become chairman of Hubbard Radio. In Washington, Bonneville is letting go of six stations that operate under the WTOP and WFED umbrella brands, including three FMs and three AMs. FM stations in St. Louis, Chicago, Washington and Cincinnati also are included. The St. Louis facilities are WARH, WIL and WXOS. Chicago stations are WDRV, WILV, WTMX and WWDV. The Cincinnati stations are WKRQ, WREW, WUBE and WYGY. At present, Hubbard Broadcasting operates four radio stations, including flagships KSTP(AM) and KSTP(FM) in the Twin Cities, as well as a dozen television stations in Minnesota, New York and New Mexico. The deal will add nearly 550 employees to Hubbard, bringing the total to about 700.

FORMER TIS ENGINEER: John Charles Fesler, formerly a design engineer at International Tapetronics Corp., died at 58. No cause of death was reported. According to an obituary sent by his friend Michael Bové, Fesler joined ITC after earning a Bachelor of Science in electrical engineering from Bradley University in Illinois. Among his efforts at ITC he developed and patented magnetic head designs that "revolutionized" tape cartridge machine audio performance with the ITC Series 99 product line.

NAB TECH INNOVATION AWARDS: The NAB is accepting nominations through March 4 for its NAB Technology Innovation Awards. The association said it presents the award to organizations that bring advanced technology exhibits and demonstrations of significant merit to the NAB Show. "The nominated exhibit should present advanced research and development projects in communications technologies that have not yet been commercialized." The Technology Innovation Awards will be presented on April 13 at the NAB Technology Luncheon as part of the spring show.

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INTERNET RADIO

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ing our products into consumers' lives as intensely as possible." Robert Coyle, national trainer for Pioneer Electronics, told Radio World. "The car is an extension of your house." Consumers, he said, have wanted Internet connectivity in cars for a long time.

Kenwood USA's senior vice president of Car Electronics, Keith Lehmann, characterized Pandora access as a trend and said, "We think this is going to be successful. We think it's going to be pretty strong for 2011."

The list of automakers offering Pandora connectivity in the vehicle is growing.

Major automakers like Ford, GM, Mercedes, BMW and Mini offer ways to connect a mobile phone to a car and for the user to control their audio entertainment on a big display in the dashboard.

Ford is offering more features on its Sync system (which already includes AM/FM, satellite radio, HD Radio and Pandora connectivity). Now Toyota has begun promoting Entune, a Web-connected dashboard system that streams Pandora and Clear Channel's iheartradio via a connected smartphone. HD Radio also is a choice on Entune.

Customers "are asking for things like Pandora, just like they asked for a USB connection to their iPods a few years ago," according to Jim Pisz, corporate manager for advanced technology development at Toyota Motor Sales USA.

Automakers and receiver manufactur-

DOSCH

(continued from page 1)

easier to improve execution than to fix faulty strategy.

"PR&E was a niche player in the industry. It was well known among the top 30 broadcast markets; it was hard to go in and *not* find PR&E consoles there. The hard part was growing the business beyond those top markets. When it tried to introduce lower-cost products, it stumbled; when it tried to introduce higher-tech products, it stumbled. And it had zero international presence, whereas at Telos about half of our business is outside the U.S. Where PR&E was trying to build awareness within markets that didn't know it, it would be hard to find a radio station in the world that doesn't have at least one Telos product in it.

"The industry really wants us to build products that do more and cost less. I think Telos will continue to grow."

Intended changes are meant to help the company improve on its solid base. For instance, Dosch knows Telos has a reputation for introducing new products

ers for the car are trying to minimize driver distraction and allow the user to get to his or her Pandora with as few steps as possible.

For example, Toyota considers cognitive strain a big driver distraction issue and says taking even three or four seconds to think about the entertainment display is too much. On its new Entune multimedia dashboard system, Pisz said, Web applications look as they usually do; they're not modified to conform to Toyota branding.

The 2012 Ford Fiesta can stream Pandora through smartphone apps and control playback through voice commands. The 2012 Ford Mustang is next in line to get Pandora support. Mini added support for Pandora iPhone apps to its in-car Connect system.

New tech means more money to automakers. Ford said shortly after the CES that its average transaction price is up approximately \$4,000 from two years ago, and the addition of Sync is one reason, along with new power trains and higher quality ratings. The automaker plans to develop more in-car technology for its vehicles such as entertainment, navigation, cell phone connectivity and Wi-Fi technologies, according to Automotive News.

SUCCESS STORY

Meanwhile, Pandora boasts some 75 million registered users in the United States and says it represents 50 percent of Internet radio listening. According to Steel, half of Pandora's listening is on

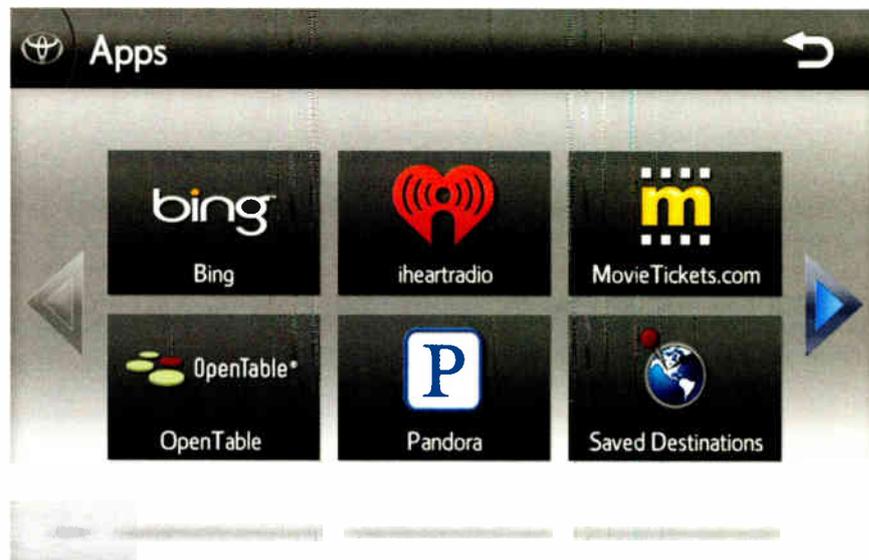
but not shipping them for a long time.

"Not enough emphasis on the execution can disappoint. One of my goals is to improve our time to market and increase the number of new products we launch every year."

I asked if he has a particular philosophy as a business executive. He mentioned the importance of being creative, of "thinking out of the box," an attribute he ascribes to Steve Church. "He can look at any problem and come up with unique solutions."

Dosch also talked about ethics. "The most successful businesses, the ones that survive long-term, are the ones that treat their employees well, pay their vendors promptly, tell the truth, keep their promises and make sure their customers are thrilled. Ethical treatment of customers, telling the truth, keeping promises, they're one and the same. Clients will continue to work with our company because of the way they are treated. We'll make mistakes, but we'll always fix them.

"This is one of the things that attracted me to Telos," he concluded, quoting Steve Church: "We're good corporate citizens."



Toyota said its Entune multimedia system will be available as an option on some models this year. Featured apps are shown. Other features are location-based services, such as personalized traffic, fuel prices, stocks, weather and sports.

mobile devices.

Pandora hired its first director of mobile and emerging media division in January, signaling its interest in becoming more of an entertainment option not just on desktops and dashboards but also on small screens, a competitor for traditional radio there as well. Pandora is now in more than 200 home electronics devices, according to Steel.

The company believes a user's experience connecting a smartphone for Pandora control of the in-dash radio "has got to be as seamless as interacting with the radio has always been" in the car, she said.

Ford Mustangs will access Pandora through the AppLink feature. At the show, sitting in a Mustang, Pandora founder Tim Westergren told the Los Angeles Times that the introduction of a phone app to control the Internet radio music service on car receivers changed everything for the 10-year-old company.

"Now, if you want to be a radio service, that's half the market." He said it feels like Pandora has "reached critical mass." The personalized Internet radio service wants "to be in every single car on every single phone," according to the account.

Bringing Internet audio into the car still involves an intermediate step like connecting a smartphone via USB cable or wirelessly over Bluetooth; once connected, the head unit controls the Pandora application on the phone and the user need not look at the phone, just the radio.

Presumably the next desirable step is for Pandora or services like it to be offered in the car directly, with no smartphone required; it's not clear if automakers are thinking along those lines yet.

Companies like Alpine visited by Radio World at the show clearly are thinking about going beyond Pandora or Rhapsody Internet radio music services

and to expand to offering talk or sports programming Internet radio services, apps, connectivity and control in the car at some point. But for now, automaker and OEM receiver offerings remain flexible, displayed as one of several on-screen menu choices, rather than as a dedicated button on the display.

Several aftermarket auto receiver makers have expanded their Pandora offerings. Some, like Sony and JVC, debuted head units with the capability to control Pandora or iheartradio through an iPhone application.

For example, Kenwood has increased its offerings from two models that support Pandora apps on connected iPhones last year, to nine such car stereo receivers for 2011. Pioneer introduced nine Pandora-compatible head units and Alpine expanded its selection of Pandora-controlling head units from one to four.

PAY ATTENTION

As automakers and receiver makers quickly develop Internet connectivity for vehicles, traditional radio industry observers say radio needs to pay attention to the new competitor in the dash.

"We're not there yet, but ubiquitous broadband connectivity in the car is getting closer. It's something we need to be concerned about," said Greater Media Vice President Radio Milford Smith.

However, the jury is still out as to whether the ability to receive Internet radio in the car would somehow displace or eclipse traditional radio.

Radio used to "own" the dash; now it's only one of many audio entertainment services in the car, according to many radio industry observers.

Automakers who spoke to Radio World aren't projecting a day when traditional AM/FM is entirely absent from the car. But current or planned products

(continued on page 10)

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INTERNET RADIO

(continued from page 8)

certainly make it easier for drivers to ignore traditional radio should they choose to. Loss of its prominence in cars would be a monumental challenge to commercial radio's business model, in this view.

Other observers say the situation is not so dire. They note that mobile phone companies are beginning to cap the bandwidth that customers can use, moving away from plans offering unlimited bandwidth use. Such

We see Pandora as redefining what radio is in a connected world.

— Jessica Steel
Pandora

limits, according to this line of thought, will result in a narrower pool of consumers who'd want to use Internet radio capability, and pay for it, in the car.

Even consumer electronics experts, speaking at a car connectivity session, had no answer for who would pay for all the bandwidth if everyone wants to use Internet devices in the car. FCC Chairman Julius Genachowski has said a bandwidth squeeze is coming.

One radio engineer said it's time to challenge Pandora's claims of 75 million users. "How many people

are really listening?" Even if 75 million have tried the service, he asked, how many are listening consistently?

Internet radios for the home were not overlooked at CES, with Grace, Pure, Livio and Sherwood introducing new tabletop radios.

Here are some of the noteworthy Internet radio devices coming on the market in 2011 as seen at CES. Look for digital radio product news in our next issue.

MEDIA SYSTEMS:

ENTUNE: Toyota said its new multimedia system "offers fully integrated and upgradeable entertainment, navigation and information services." Entune includes Pandora, XM, iheartradio and HD Radio; it competes with Ford Sync.

After downloading a mobile application and when using a Bluetooth-capable phone with a Toyota vehicle, customers can access personalized content and services. Featured apps include Bing, iheartradio, MovieTickets.com, OpenTable.com and Pandora, as well as location-based services such as personalized traffic, fuel prices, stocks, weather and sports. Toyota Entune also includes support for read-back and replay capabilities for text messages.

Toyota told Radio World the setup can be upgraded via over-the-air software updates. Toyota Entune will be available as an option on some models this year.

FORD: The 2012 Ford Fiesta already can stream Pandora through smartphones apps, and control play-back through voice commands. Mustang 2012 owners are next in line for Sync AppLink, the software application that gives Sync users hands-free voice control

of smartphone apps. Ford went live with AppLink as a download on www.syncmyride.com, available to 2011 Fiesta owners for mobile apps, including Pandora Internet radio, Stitcher news radio and OpenBeak. Ford says that by adding AppLink compatibility factory-installed to the Mustang, it is showing its commitment to advanced in-car connectivity in more vehicles. It cites studies indicating that 46 percent of adult smartphone users have apps on their phones and 36 percent of those admit to using those apps while commuting.

CAR INTERNET RADIOS:

ALPINE: Receiver maker Alpine is expanding the number of head units that can control Pandora with an app on a USB-connected iPhone from one to four. The radios control multiple Pandora functions and add the ability to create custom stations. The iDA-X305S from 2010 remains in the Pandora-capable lineup and lists for \$399. The lowest priced unit is the CDE-122 CD receiver for \$180.

JVC: Receiver manufacturer JVC announced four head units that control a Pandora Internet app from a USB-connected iPhone, its first such models. Two CD receivers in the regular series list for \$179 and \$219. The two Arsenal CD-receivers list for \$189 and \$269, respectively.

KENWOOD: Last year, Kenwood showed two head units with Pandora control through an iPhone app; this year it is including Pandora control on nine head units, including Pandora control on all five of its new in-dash multi-

(continued on page 12)

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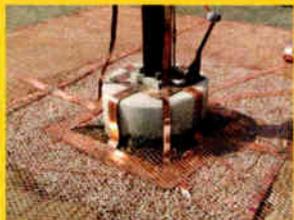
All of the above are indicators of hidden ground system problems that may be reducing your coverage.

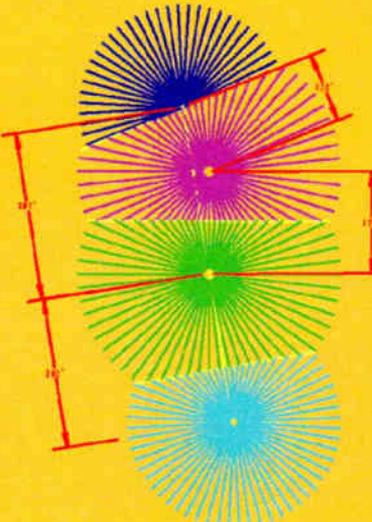
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SAMPLE LINE REPLACEMENT
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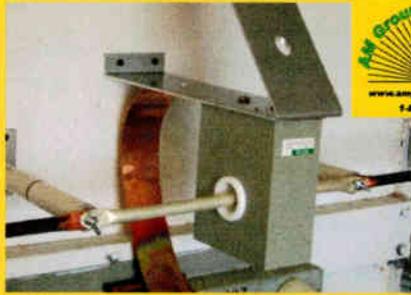
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INTERNET RADIO

(continued from page 10)

media/navigation systems, two CD receivers and two receivers that do not contain CD players. One of the new units is the Excelon CD receiver KDC-X995, which includes a five-line LCD display that can be switched to a larger three-line text for easier viewing. The unit ships in March and will list for \$380. Another unit featuring Pandora is the KIV-701 digital media receiver that includes a three-inch color display and plays iPod/iPhone/iTouch audio and video files. The unit ships in April and will list for \$450.

LIVIO RADIO: The Michigan-based Internet radio company unveiled two in-vehicle Internet radio devices. The Carmen, Livio's new FM transmitter, offers auxiliary output capabilities for users looking to take audio files available for free on the Internet into a car or boat. The patent-pending Carmen software automatically launches once users connect the device to their Mac or PC, and records the programming for later listening. With the company's Bluetooth Internet Radio Car Kit, users can stream the Livio Radio Car Internet Radio App, which makes available 45,000 radio stations including NPR and Pandora Internet stations. They can also use the kit to talk hands-free using Bluetooth controls.

"We're starting 2011 with an emphasis on the vehicle," said Livio Radio Founder/CEO Jake Sigal. "With 48 percent of non-smartphone owners expecting to upgrade to a more sophisticated device in 2011, the demand for these products will only grow."

PIONEER: Nine of Pioneer's 2011 automotive in-dash products offer Pandora streaming and control through a connected Apple iPhone. Pioneer's latest Pandora offerings expand its car electronics lineup with two CD players, three audio/video, two digital media players and two navigation systems. New to its CD player line, Pandora capability is integrated into two units, the DEH-P6300UB and the DEH-P8300UB. With a connected iPhone, users can view and select Pandora stations stored on their Pandora account directly on the CD player. They are available now and list starting at \$150 and \$180, respectively.

AHA RADIO: Pioneer also brought another Internet radio service, Aha Radio, to two of its navigation systems, the AVIC-X930BT and AVIC-Z130BT, to be available in March for a suggested price of \$800 and \$1,200, respectively. Using an iPhone with the free Aha Radio Mobile App connected to the new AVIC systems, users can listen to traffic conditions and Facebook and Twitter updates; they can access podcasts and other services such as the "Hungry" and "Coffee" stations, which deliver vicinity search results and directions to restaurant categories listed on Yelp.

ASTEROID: Parrot says its new Asteroid system lets drivers make hands-free phone calls, listen to music from various sources and connect to GPS or the



Pandora capability is integrated into the Pioneer DEH-P6300UB. With a connected iPhone, users can view and select Pandora stations stored on their Pandora account directly on the CD player.



Parrot says its Asteroid system is coming to the U.S. by mid-year. It lets drivers make hands-free phone calls, listen to music from various sources and connect to GPS or the Internet.

Internet. The car receiver with Web service apps uses the Android operating system. Asteroid enables listening to music from various sources: USB key, iPhone/iPod, MP3 player, SD card and now Web radio stations where 3G connectivity is available. Music files can also be sent on the car receiver from a mobile phone and via Bluetooth. Parrot says Asteroid will be available in Europe in the first quarter of 2011 and in the U.S. in the

second quarter. Price is to be announced.

SONY: The company's mobile electronics division launched its first two head units with Pandora Link to control a Pandora app on a USB-connected iPhone, as well as on Bluetooth-connected BlackBerry and Android smartphones. Both satellite- and HD Radio-ready units ship this summer. Price is to be announced.

HOME INTERNET RADIOS:

PURE: The U.K.-based company offered three Internet radios to U.S. consumers last year. Now it has introduced two additional Wi-Fi-equipped Internet radios.

With Contour, users push to eject an iPod/iPhone dock. It includes video outputs so users can view videos from their iPhone or iPod on their TV. Contour will list for \$299. The portable One Flow provides up to 20 hours of listening per charge when used with optional rechargeable ChargePak. Pure also announced an i-20 iPod/iPhone dock. One Flow and i-20 are available at the pure.com/us/store for list \$149 and \$99, respectively.

The company also launched a new "cloud-based" music service. With FlowSongs users can buy music from Flow-equipped Pure devices like Contour and One Flow. Users tag a song on an Internet radio station or FM, then buy the track, all through their Wi-Fi radio. Tracks will be individually priced between 99 cents and \$1.49. A yearly subscription to FlowSongs will be \$5.99.

Users push to eject an iPod/iPhone dock on the Contour Internet radio from Pure.



GRACE: The company's latest Internet radio features a 3.5 inch color display and a Party Mode button that synchs all radios in the new Grace products to deliver the same programming throughout a home. The unit can be controlled from new apps loaded on iPhone/iPod Touches and Android phones. The radio streams Internet stations as well as Pandora, Rhapsody, Sirius Internet Radio, Live 365, iheartradio, NPR, BBC, NOAA and other services.

SHERWOOD: The receiver maker's Internet streaming appliance is the iPod/iPhone-docking iNet-20. It streams Pandora and Rhapsody music services, features alarm-clock functions and doubles as a photo frame.

ALSO OF INTEREST:

GROOVESHARK, LIVIO: On-demand music service Grooveshark and Internet radio company Livio Radio are partnering in devices for music sharing in vehicles as well as portable units.

Livio will add Grooveshark onto its products. "Our goal is to get Grooveshark into the car and your home with minimal effort," Livio Radio founder and Chief Executive Officer Jake Sigal said at CES.



Livio Radio and on-demand music service Grooveshark demoed a prototype device that plugs into a cigarette lighter and would allow Livio users to access Grooveshark music in the car and play through the car speakers.

Livio and Grooveshark demoed a prototype device that plugs into a cigarette lighter and would allow Livio users to access Grooveshark music in the car and play the tunes through the car speakers. A Grooveshark spokesman told Radio World the company expects the device to be available this summer in the \$60 to \$80 price range. Grooveshark, based in Gainesville, Fla., was founded in 2006 by Sam Tarantino and Josh Greenberg; they describe themselves as "two guys looking to make a service offering the world on-demand music, accessible on as many devices as possible." The company says it has 20 million monthly unique visitors to its website at listen.grooveshark.com and a library of 7 million songs.

What will be the impact of all these new tools on radio? Comment on this or any story. Write to radioworld@nbmedia.com.

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Guy Wires Down? Something Ain't Right

Also: Yawcam Freeware Keeps an Eye on Things

As a kid I played a game with my sister in which we stacked a bunch of dominoes and then tried to remove one at a time before the entire stack tumbled over.

WORKBENCH

by John Bisset

Read more Workbench articles online at radioworld.com

Fig. 1 is a takeoff from that game. How many guy wires can you remove from an AM tower without it falling over?

Hey, look, it's still standing in Fig. 2. But I can hear the owner now: "Ahhh,

it's only AM ..."

Send me pix of your "what to avoid" scenarios. I'm at johnpbisset@gmail.com.

Aaron Read, general manager of WEOS and WHWS in upstate New York, comments on an article by Leslie Stimson in the Dec. 15, 2010 Radio World that discussed cellular phones with FM reception.

An issue of note is that several higher-end "smartphones" such as the iPhone and Motorola Droid have physical hardware for FM radio reception but lack soft-

ware support for accessing that hardware.

Some enterprising hackers have figured out ways to "get at" all sorts of hidden features on these phones, including activating the radio. For example, the Motorola/Verizon Droid X has software support built in for its radio while the Droid 2 does not. Yet there's a hack available on the XDA Developers forum that unlocks it; see www.tinyurl.com/droid2radio.

If you're not sure whether your phone has latent radio capability, try doing a quick Google search combining the names of the carrier (AT&T, Verizon, etc.), the phone manufacturer (HTC, Motorola, Samsung, Apple, etc.), the operating system (Android, iPhone OS,

Windows Mobile 6 or 7, etc.) and the phone itself (Droid 2, Omnia, Defy, etc.), along with the word "radio." This likely will turn up any information.

As one might imagine, there tend to be more hacks for the Android OS thanks to its more open architecture, but there are some for Apple and a few for Windows Mobile, too.

Aaron Read can be reached at read@hws.edu. Aaron has encouraged visitors to his station websites to listen using their Droids or iPhones. Great cross-promotion. Visit www.whws.fm.

Lew Wallach, N9WL, is not only a ham but a CPA. Having read our tips in the Dec. 15 *Workbench* on emergency preparedness at the transmitter site, Lew



Fig. 1: Go get your hard hat.

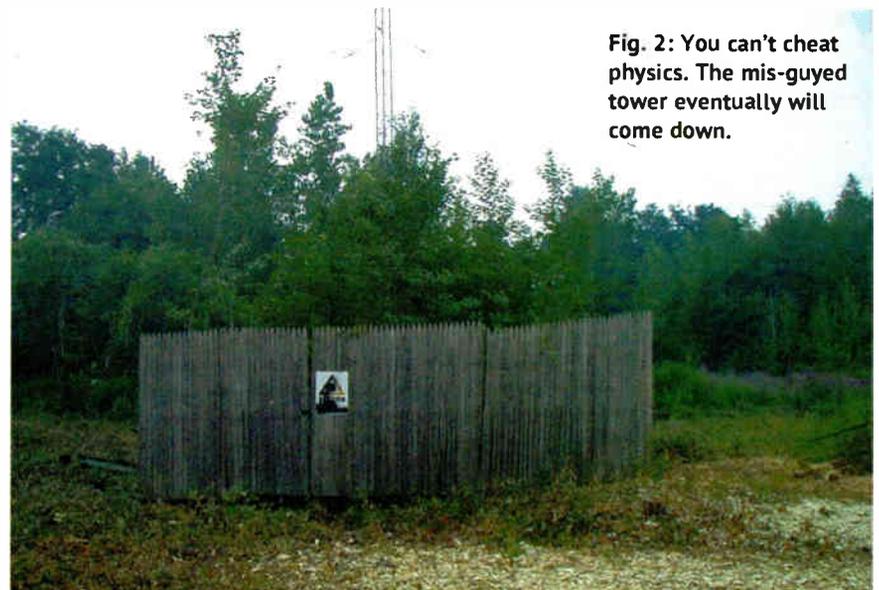


Fig. 2: You can't cheat physics. The mis-guyed tower eventually will come down.

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During a backpacking trip that tested Murphy's Law, Lew says his stadium space blanket made the difference between discomfort and hypothermia. He only has experience with the Thermos Space Blanket brand; a number of manufacturers make such products, available at nearly every outdoor store and even Wal-Mart.

He adds that emergency survival

(continued on page 22)

Report-IT Enterprise Revolutionizes Newsgathering for Chum Radio

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Chris Larke, Broadcast Engineer, CHUM Radio Vancouver

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Radio Host Ray Grover uses Report-IT

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Chris Larke, Broadcast Engineer, CHUM Radio Vancouver



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NRB Is Pleased With Mood Shift

But Association Still Wary Despite Fall Election Outcome

BY CRAIG JOHNSTON

The National Religious Broadcasters association worries about a "rampage of increasing federal power over the lives of Americans, including communications platforms."

That's the phrasing of Senior Vice President and General Counsel Craig Parshall, who spoke to Radio World on the cusp of the organization's 2011 annual convention in Nashville, which starts Feb. 26.

NRB was pleased with the outcome of the recent elections, he said, because voters appeared to want change in the federal government.

"The American people voted in the mid-term elections to rethink this movement, really return power and control back to the states, local government and to the people."

Prior to Republicans taking the House of Representatives, Parshall said, "It seemed that the mood in Washington — in that Democrat House, Democrat Senate and the Obama White House — was that if there was the hint of a problem out there, that we need to,

number one, subsidize the problem, and number two, federalize it with regulations and reach out with federal power over that problem."

NRB has focused its concerns particularly on the Federal Communications Commission under Chairman Julius Genachowski. Parshall said the FCC is an agency, not a lawmaking body.

"They're to implement and administrate the law created and delegated by Congress. And so I think Congress is going to take some of this back, and they're going to stand in the way of the FCC's ambition."

Parshall cited examples of what he considers potential egregious FCC overreaching. One is the Future of Media proceeding, which included a 2010 panel discussion in which Parshall took part.

"That proceeding is trying to wrangle the issue of what they [the FCC]



Craig Parshall: 'We don't want to allow the federal government to place unreasonable restrictions on existing media organizations that are already floundering.'

perceive to be declining journalistic standards in the media. ... What was the federal government doing analyzing the performance of the media? It ought to be the other way around; the media was created in freedom of the press, and the First Amendment was created so that the media and the press could be free enough to review the actions of the government. Not vice versa."

Another area of jurisdictional concern to NRB is the FCC's attempt to regulate the Internet through its network neutrality proceedings.

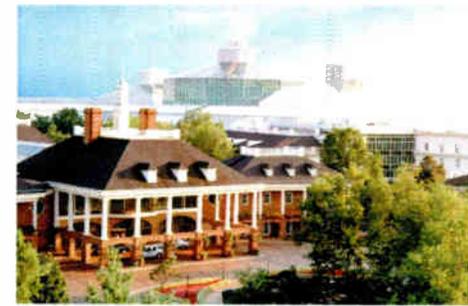
"We're very supportive of the movement of a number of folks on Capitol Hill, to hold hearings and to circumscribe the ability of the FCC to regulate" in this arena.

(continued on page 18)

IF YOU GO

What: NRB 2011 Convention & Exposition

Where: Gaylord Opryland Resort & Convention Center



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How: <http://nrbconvention.org/>

How Much: \$625 for members, \$350 for spouses and first-time attendees, \$725 for others; daily rates and student/faculty registrations available



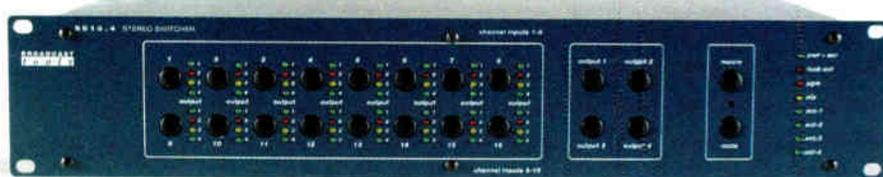
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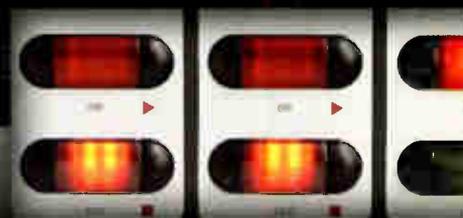
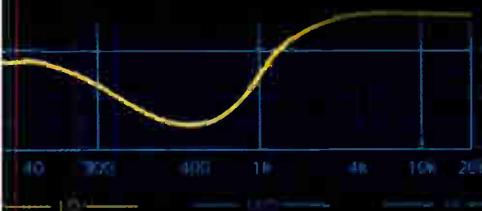
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NRB*(continued from page 16)*

Parshall describes an "elephant in the room" in the network neutrality discussions.

"Whether it's Microsoft or AT&T or Google, all the players in this Internet debate are talking about wanting to retain their free-market ability to function without government regulation; and we can sympathize with that. But no one, including the FCC, seems to be talking seriously about the right of consumers and the American citizenry

to use these platforms on the Internet, Web-based platforms, for freedom of viewpoint."

The commission's National Broadband Plan, which includes capturing some spectrum now licensed to broadcasters, is also on NRB's radar screen.

"They still haven't given clarification on that," said Parshall. "So we're going to err on the side of caution. Not that we're implying bad faith on the part of the FCC in how they're going to do this; we simply are very concerned that whatever mechanism they use, an auction and so forth, we're concerned that it not

be directly or indirectly coercive, sort of arm-twisting broadcasters, particularly TV broadcasters, to give up spectrum — even if not required to, simply to make it too difficult not to."

'DELICATE BALANCE'

In areas of regulation such as encouraging media diversity or easing cross-ownership rules, Parshall describes the NRB's stance as nuanced. He paraphrased NRB President/CEO Dr. Frank Wright testifying at an FCC field hearing several years ago.

"We have great sympathy to provid-

ing opportunity to small local media, and small local broadcasters in particular, because a lot of our members and a lot of folks in Christian broadcasting qualify for that category; we want to make sure they have every opportunity to flourish. And we see problems with monopolies, obviously.

"On the other hand, [we oppose] too tight a limit on cross-ownership and things like this, particularly in ... a downturn economy, where advertising is still a struggle for commercial radio and television, and [given that] technology is changing so quickly on all forms of communication platforms.

"Studies ... tell us that people are spending less time getting their news and information on TV, radio and newspapers, over the last five years at least, and almost doubling the time they're spending on the Internet getting their news and information.

"We don't want to allow the federal government to place unreasonable restrictions on existing media organizations that are already floundering. It's got to be a delicate balance."

That said, Parshall issued a qualifier.

"There are some who want to change media ownership rules to gerrymander a result in terms of changing the kind of content that comes out of, particularly, talk radio." If the goal was to silence

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KEY EVENTS**SATURDAY**

"Social Media Strategies" — Speakers include Mark Ramsey of Mark Ramsey Media and Rey Mena of Emmis Interactive

Evening General Session — Dr. Frank Wright, NRB President & CEO; Voddie Baucham of Voddie Baucham Ministries; Jay Sekulow of American Center for Law and Justice; Nicole C. Mullen of Word Records

Radio Reception — Among the award winners: KCBI is NRB Major-Market Radio Station of the Year; Janet Parshall is NRB Air Personality of the Year in the talk format; "Time to Revive With Kyle Martin" receives the NRB Radio Genesis Award

SUNDAY

Worship Service — With James MacDonald of "Walk in the Word"

Expo Opening

"Connecting With Audiences in an Age of Distraction" — A conversation about movies, entertainment and the future of media; speakers include Michael Flaherty, president of Walden Media.

EXHIBIT SAMPLING

NRB exhibits are Sunday noon to 5 p.m.; Monday 10 to 5 p.m.; and Tuesday 10 a.m. to 4 p.m. The following is a sampling of booths of interest to radio attendees. For the full list see nrbconvention.org. The exhibit hall averages 130,000 square feet and some 200 vendors.

615 Music
American Family Radio
Anserfone Call Centers
BGS
BSW

Broadcast Depot
Broadcast Electronics
Broadcast Software International
Campus Crusade for Christ
Comrex Corp.
ENCO Systems
Electronics Research Inc.
Galcom International
Glorystar Satellite Systems
Jampro Antennas
Ka You Communications
Kintronic Labs
LeSea Broadcasting
Linear Industries
MediaSpan Online
Myers Information Systems

Nautel
NewTek
Next Wave Radio Network
OMB America
Propagation Systems/PSI
RF Specialties Group
RCS
RRsat Global
Communications Network
RVR USA
SPX Communication
Technology
Shively Labs
Sony
StreamOn
WorldCast Systems

Average attendance of recent past NRB conventions is 4,500.



conservative talk radio and expand liberal talk radio, he said. NRB would object.

Discussion about the Fairness Doctrine is never far from NRB's mind. The organization in late January sent an open letter to President Obama asking him to oppose publicly what it calls "proposals to censor free speech." NRB commended Obama for his "dignified and presidential" remarks in Tucson, Ariz., after the shootings there, but also said NRB "expects the battle to define 'civil discourse' to ramp up in coming months, bringing with it a renewed effort to reinstate the Fairness Doctrine." It said the doctrine could be

(continued on page 22)

MONDAY

Women's Breakfast — Gracia Burnham of the Martin & Gracia Burnham Foundation; Natalie Grant of Curb Records

International Luncheon — NRB has not revealed the name of the speaker but says he "serves in a culture where Christians have long been persecuted, some losing their lives for their faith in Jesus Christ. Yet this man has not shrunk away from proclaiming God's truth using Christian radio."

Evening General Session — With Ravi Zacharias of Ravi Zacharias International Ministries

TUESDAY

Public Policy Debate — The theme is the Christian church's response to the gay rights movement. With Janet Parshall, Rev. Dr. Cindi Love of gay rights organization Soulforce and Joe Dallas of Genesis Biblical Counseling.

Banquet — With Chuck Swindoll of Insight for Living, and Denver & the Mile High Orchestra

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NRB

(continued from page 19)

brought back with just three FCC commissioners' votes.

INDECENCY SUPPORT

One area in which NRB agrees with the FCC is enforcement of indecency standards for broadcasters.

"The current rules that are being enforced by the FCC are reasonable, they are constitutional, they have a legal authority, and they're not arbitrary and capricious. These [rules] are about as clear

as you can get on this issue, and I think they've been enforced with an even hand.

"We're glad that the current administration of the FCC is continuing those same rules that were inaugurated under the Kevin Martin administration."

Regarding whether broadcasters should be obliged to pay rights fees to performers, Parshall stated: "We're shoulder to shoulder with NAB on opposing performance rights; we have been just as vehement and just as interested in opposing it as NAB has been, and have been working with them and alongside of them to oppose it."

Another area of common interest with the National Association of Broadcasters is FM radio reception in cell phones and other mobile devices. Parshall said it has been a long-term goal of NRB President Frank Wright "that radio needs to have a footprint in the wireless handheld platforms. And clearly, that's where a lot of people are saying that the future of communications is: in the hands of the people who are going to hold onto these wireless handheld devices. And why not make sure that radio isn't one of the applications on those cell phones?"



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WORKBENCH

(continued from page 14)

equipment is not the place to try saving a few dollars.

Lew also has a tip for soldering. A stainless steel scrub pad cleans his soldering iron tip better than a wet sponge. A budget-busting three-pack for \$1 at the local Dollar Store will clean a lot of tips. They also are handy to stuff inside conduit and other insect and rodent access points. They don't rust and the rodents haven't eaten through them — yet.

Lew Wallach, N9WL, can be reached at lew@lew-cpa.com.

Atlanta engineer Allen Alleo calls your attention to www.yawcam.com. This freeware is webcam software written in Java, simple and easy to use.

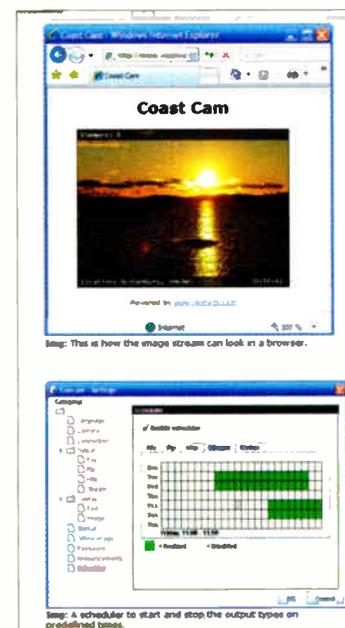


Fig. 3: Yawcam is free. The name is short for 'Yet Another Webcam software.'

Yawcam features include video streaming, image snapshots, a built-in Web server, motion detection, FTP upload, password protection and time-lapse movies. You can protect your transmitter site inexpensively. Although Yawcam is free, consider making a donation if you find the software useful.

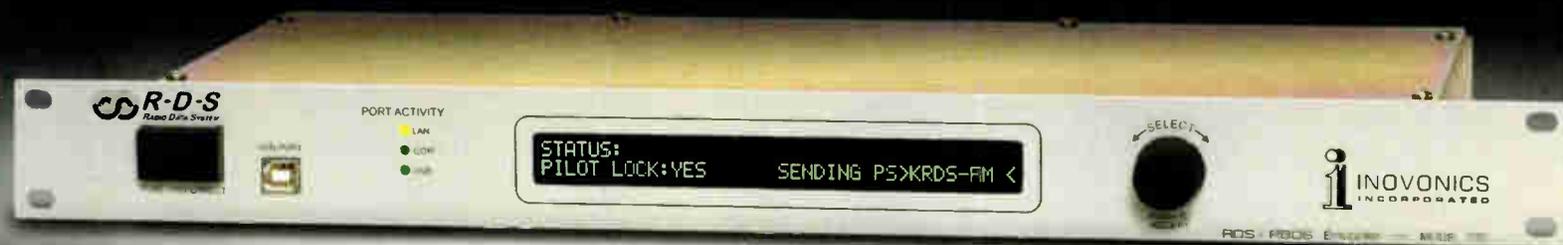
Allen can be reached at alleo21@yahoo.com.

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

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They Put the Juice in Powerful Radio

We Conclude Our Look at the Evolution of Broadcast Transmitter Power Supplies

BY JAMES E. O'NEAL

In the Feb. 1 issue we began a discussion of the evolution of transmitter power supplies.

ROOTS OF RADIO

One of the more infamous radio transmitter motor-generator installations was in Las Cruces, N.M., at KOB, when it was part of New Mexico A&M College (now New Mexico State University).

As related by Ann M. Velia in the 1972 article "KOB: Goddard's Magic Mast," published by New Mexico State University, the station was founded in 1919 as 5XD by Dr. Ralph W. Goddard, who became the dean of the school's engineering department and played a pivotal role in the station's growth and development.

By 1929, KOB had developed into a 10 kW operation, and had FRC permission to jump to 20 kW.

Goddard was heavily involved in the design of the radio apparatus in use, and relied on motor generators for the transmitter's DC voltages, using series-connected units (with frames elevated above ground) to achieve the necessary plate potential.

It's reported that he watched over this early incantation of KOB like a mother hen, and kept a special wooden yardstick handy for whacking generator brushes to make sure that they were seated properly.

Ordinarily, southwestern New Mexico is quite arid, but on one particular day in late 1929, humidity levels were much higher than normal — so much so that the concrete floor of the outdoor generator room was damp, as were the soles of Goddard's shoes and his favorite yardstick.

During a routine check of the generator room in the early afternoon of Dec. 30, Goddard tapped brushes of the 20,000 volt machine for the last time. The jolt he received was instantly fatal.

Without his nurturing presence, support for the station waned. It was moved and later sold off to commercial interests. (It has been in Albuquerque since 1932 and today operates as KKOB.)

IN ROTATION

Rotating machinery and its upkeep requirements didn't appeal to some

transmitter designers.

General Electric engineers had their own ideas about developing high-voltage DC and borrowed technology developed by GE as an offshoot of William Coolidge's research on hot cathode X-ray tubes, as reported in Dr. Saul Dushman's article "A New Device for Rectifying High Tension Alternating Currents" in the General Electric Review of March 1915.

This was the Kenotron high-vacuum rectifier. (The word "Kenotron" was "Greco-Schenectady" nomenclature, borrowing from the Greek words for "empty space" and "appliance.") The Kenotron initially was touted as a means for creating high-voltage DC for X-ray tubes and electrostatic precipitators, but found its way into several transmitter power supplies.

The Kenotron really wasn't the perfect answer for broadcast transmitter applications, as it was intended for very high-voltage, fairly low-current uses,



and had a significant internal voltage drop. To provide the necessary plate current for even moderately sized transmitters, multiple Kenotrons had to be paralleled together. Evidence of this comes from the photograph of Chicago's WENR early transmitter installation shown above right. A total of 18 type UV-214 Kenotrons can be counted in the "bay" between the clock and far wall. Existing documentation (I.J. Karr and C.J. Burnside's article "Developments in Broadcast Transmitters," distributed in the proceedings of an IRE convention in

1930) mentions that they were connected in a six-phase double "Y" configuration. Several other Kenotrons are visible in the photo.



Kenotron diodes, originally designed by GE for powering X-ray tubes and electrostatic precipitators, were pressed into service to provide DC for some early transmitters. This 1920s photo shows the installation of multiple Kenotrons at Chicago's WENR. Note the railing that separates operators and visitors from the high-voltage circuitry. The extended venetian blind cord provides evidence that this steel version of a 'velvet rope' didn't provide that much of a barrier. Note also the water-cooling coils on the Kenotrons.

Cooper-Hewitt mercury arc rectifiers were used to provide high-voltage DC power in some transmitters. In some cases, the operator had to manually rock the rectifier to start the arc. The tube shown is fairly small by mercury arc standards, being rated for 120 V service (at 30 amps); however it contains in excess of 15 pounds of mercury.

All of the tubes pictured are equipped with water-cooling coils. The internal voltage drop was so great as to require cooling for the Kenotrons, adding to the overall complexity of the transmitter.

POUNDS OF MERCURY

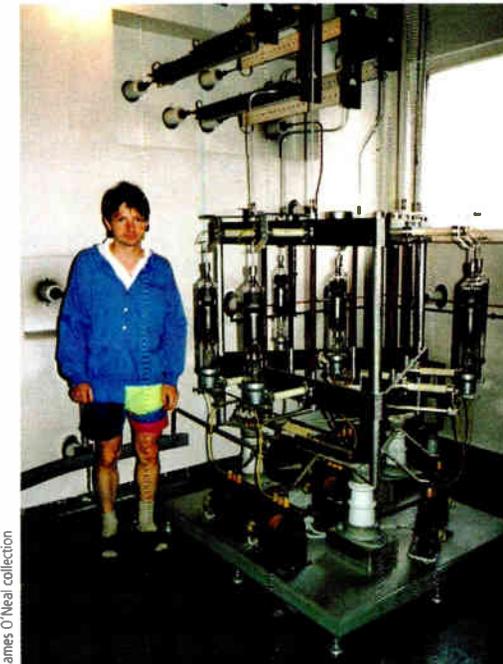
Another AC-to-DC device available to early broadcast transmitter designers was the Cooper-Hewitt rectifier (also known as the mercury arc rectifier).

While it depended upon ionization of mercury for its operation, any resemblance to more modern mercury vapor rectifying tubes stopped there. The Cooper-Hewitt device was based on the principle that when an arc was drawn between a conductor and a pool of mercury in a vacuum environment, current flowed in only one direction.

The "production model" Cooper-

Hewitt rectifier came in several forms, but all were built around a reservoir containing several pounds of liquid mercury, and having at least two electrode-containing "sidearms" attached.

To start the rectification process, smaller models were energized and then



Mercury vapor rectifiers replaced motor-generators in providing transmitter high-voltage DC. Shown here is part of a three-phase power supply used with a shortwave transmitter installed in 1938 near Munich, Germany. OSHA would probably not have approved.

rocked side-to-side until the sloshing mercury made contact with a separate "ignitor" electrode, thus initiating an arc. Physically larger units incorporated an

(continued on page 26)

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SUPPLIES*(continued from page 24)*

ignitor electrode assembly that could be moved outside of the containment vessel by an electromagnet, thus allowing the initial arc to be drawn remotely. Once the mercury surface was "arced" and ionization began, the tube could be left alone, with the electrodes in the sidearms serving as rectifier tube plates and the mercury pool as the cathode, thus providing full-wave rectification. (Larger tubes with multiple sidearms were built for polyphase AC rectification applications.)

While the Cooper-Hewitt rectifier was a step forward in obtaining DC for transmitter plate supplies, it too was far from perfect, requiring frequent operator attention. (The writer once viewed an early broadcast transmitter with such a rectifier — a small "steering wheel" was provided for the technician to rock the glass vessel as part of the sign-on procedure.)

Another problem, though not considered that great 80 or so years ago, was the volume of mercury in the rectifier. The rectifier vessel was usually glass, and the sidearm electrodes were the weakest part. If mercury arc rectifiers were mishandled, it was easy to snap off a sidearm and release several pounds of mercury onto the building floor. The rectifiers could also explode on their own, creating an equally nasty problem.

The "sizzle" of the arc necessitated some careful design work in the power supply filter area.

MERCURY VAPOR TUBES

The Cooper-Hewitt mercury arc rectifier eventually morphed into the hot cathode mercury vapor rectifier, which ultimately eliminated the high-voltage motor-generator sets needed for plate voltages.

However, these tubes still needed spe-

cial handling and were not exactly fool-proof either. More than one young radio engineer learned the hard way that they had to be "conditioned" before being placed into service.

This meant operating them for some time with only filament voltage applied. This heated up and vaporized any liquid mercury that might have lodged between internal tube supports or elements during shipping or storage. If "un-conditioned" tubes were hit with plate voltage, the accumulated mercury could cause a heavy short circuit with predictable results.

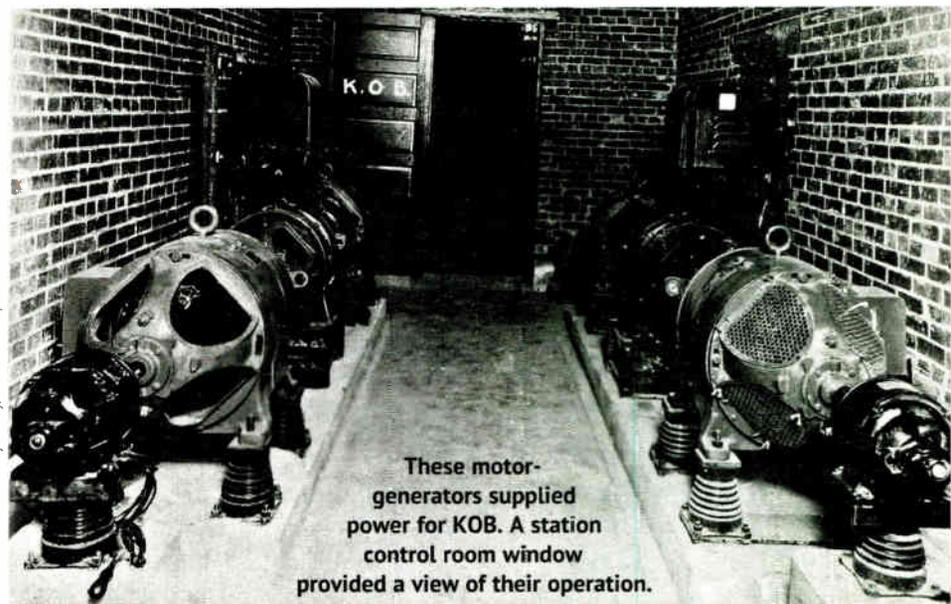
Even when well-treated, mercury vapor tubes could still misbehave. Occasionally, and for no apparent reason, they could "arc back" (short circuit) while in operation. The behemoth WLW transmitter used six giant mercury vapor bottles, and when one of them fired back, operators reported that the building shook. The utility company supplying 33 kV AC to the building was also immediately aware of the situation.

SOLID-STATE, 80 YEARS AGO

Solid-state technology eventually put an end to rotating machinery and mercury-filled devices for providing transmitter DC voltages. This came about in the late 1950s and early 1960s, and was driven by the advent of the transistor.

However, it's not quite true to state that there were no solid-state rectifying devices used earlier. The copper oxide rectifier was one of these, having been invented in the late 1920s and commercialized by several companies. But as it was basically a low-voltage device, the majority of Cu_2O rectifiers saw service in lead-acid battery chargers and meter rectifiers.

There was one documented use of this technology in transmitters for providing DC plate potentials in the 1940s. Westinghouse grafted RCA's Rectox copper oxide rectifiers (more at home in other applications) into its 5, 10 and 50

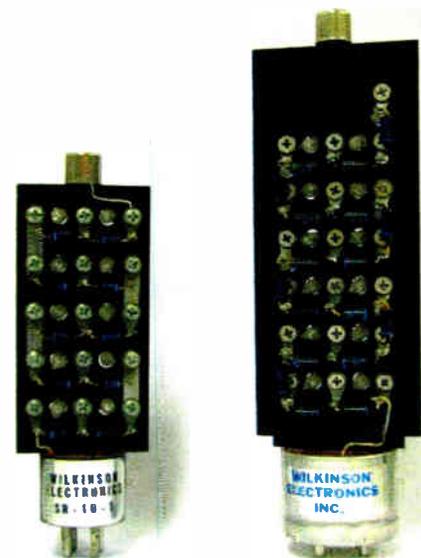


These motor-generators supplied power for KOB. A station control room window provided a view of their operation.



Dr. Ralph W. Goddard, dean of the engineering school at New Mexico A&M in Las Cruces, founded radio station KOB. He initially 'piggy-backed' transmitter high-voltage DC from motor-generator sets in a college engineering lab before acquiring dedicated units for the station. Goddard became a martyr to early transmitter engineers when he was accidentally electrocuted by the station's high-voltage motor-generator devices in late 1929.

James O'Real collection



Silicon rectifier stacks such as these made by Wilkinson began to displace the beloved mercury vapor tube in the 1960s. They weren't nearly as entertaining to watch. These two units replaced the 866 and 575 MV tubes used in many transmitters.

kW models, but only for tubes requiring 3 kV or less. Main plate voltage sources were supplied by more conventional technologies. (See R.N. Harmon's "Copper-Oxide Rectifiers in Standard Broadcast Transmitters" in the Proceedings of the IRE from December 1942.)

And according to most reports, even in these lower-voltage applications, the rectifiers weren't that reliable. The author was unable to locate any record of selenium rectifiers being used in high-voltage radio transmitter applications.

SILICON STACKS TO THE RESCUE

It wasn't until the advent of reliable high-voltage high-current silicon rectifiers that mercury vapor tubes finally began to be phased out of broadcast

transmitter designs. At least one company, Wilkinson, made high-voltage silicon stack devices to directly replace the mercury-bearing rectifiers.

Silicon rectifiers cut electric bills and transmitter room heat, and they made life simpler — indeed, in some cases, safer. But they also eliminated an unintended transmitter power supply feature, a modulation indicator of sorts. As one transmitter engineer reflected on that loss: "There was always something very comforting and reassuring about watching the brightness of the mercury vapor rectifier's glow change in step with the modulation."

James O'Neal is a frequent contributor. Comment on this or any article. Write to radioworld@nbmedia.com.

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USERREPORT

BY WILLIAM P. ABBOTT
General Manager
WDJA(AM)

DELRAY BEACH, FLA. — An industry colleague recently referred me to the new Comrex ARC software for Android-based phones.

Being the GM of WDJA, I am familiar with the Comrex systems. We have been using the Comrex Access rack unit and the Comrex Access Portable for years. Some months ago, I purchased an HTC EVO 4G phone for use on the Sprint Network.

After learning about Comrex ARC I went to the Android Market and downloaded it directly into the phone. Being a former corporate IT person, I had low expectations for this software. After all, what could a phone do any better than a proven platform for live remote broadcasts? I was surprised.

PROXY SERVER

The hardest part about setting up Comrex ARC is that in most cases it will require you to use an SIP proxy server to function correctly. I went to the Comrex website and downloaded the manual for Comrex ARC. It outlined a step-by-step process for installing the software and configuring a free SIP proxy server at www.iptel.org.

The process for setting up the SIP server account was pretty straightforward. Once that was done, all that was left to do was to configure the Comrex ARC SIP settings to match what was set up on the server.

Comrex ARC will connect through any data connection that your phone is capable of providing. I first tested it on a Sprint 3G connection. I was able to connect quickly and maintain a feed with approximately a 1 second delay. I did experience some minor packet dropout from time to time. However it was not bad and seemed to be normal network congestion.

The 4G test was nearly flawless. With that much data bandwidth, dropouts were hard to find. Above all, the best experience was with Wi-Fi. I performed a 60-minute test on Wi-Fi and experienced no data packet dropout at all.

The audio quality will also depend heavily upon your individual phone's microphone audio. I found that with my HTC EVO the audio quality using the built-in microphone was good but the level was high due to the type of micro-



phone that it is.

I purchased an adapter cable that plugs into the audio jack on the EVO and breaks it out to an XLR connector for microphone input and a 1/8-inch female jack for headphones. Using a Shure Beta 58A microphone and standard headphones the audio quality was crystal clear. The microphone audio level control in the Comrex ARC software was much more sensitive and responsive when using the external microphone input.

I compared the audio quality of the Comrex ARC to the Access Portable unit. The Comrex ARC audio quality using my HTC EVO with external audio input connected sounded equally as good as that arriving via the portable Comrex codec. I recommend it for live remote broadcasts, especially when you may

have a lone reporter in the field attempting to capture a live interview, where a full-blown Comrex Portable might be too cumbersome.

I have been receiving requests from some of the station's brokered show clients asking if I will set up Comrex ARC on their phones so that they can broadcast from home or wherever else they may want to broadcast from. I can see how this type of technological convenience will be a game-changer for the talk radio industry.

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TECHUPDATE

IK MULTIMEDIA INTRODUCES iRIG MIC

IK Multimedia's iRig Mic is a new handheld condenser microphone for use with iPhone, iPod Touch and iPad to take care your mobile sound needs.

According to the company it is suitable for a singer, vocalist or songwriter on the move, also for recording news events, speeches, instruments, performances or other sound sources in the studio, on stage or in the field.

The iRig Mic features a unidirectional condenser-electret microphone capsule that records in both close and long-distance mic conditions. It provides real-time monitoring with its dual mini-jack connector design. A three-level gain switch makes it adjustable for sound pressure conditions from soft speaking to loud playing. Its form is suitable for handheld performance and allows users to mount it on any mic stand. The rugged metal body is road-ready for the mobile musician.

iRig Mic ships in the first quarter of 2011 and retails for \$59.99.

For more information, contact IK Multimedia in Florida at (954) 846-9101 or visit www.ikmultimedia.com/irigmic.



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World Radio History

JK Audio Melds Broadcast and Bluetooth

Play-by-Play Announcer Finds BlueDriver
Makes Broadcasting Possible From Anywhere

USERREPORT

BY BRIAN SCOTT
Play-by-Play Announcer
1610 AM XRB

BROWNSBURG, IND. — The JK Audio BlueDriver F-3 Bluetooth wireless audio interface has been godsend for my application.

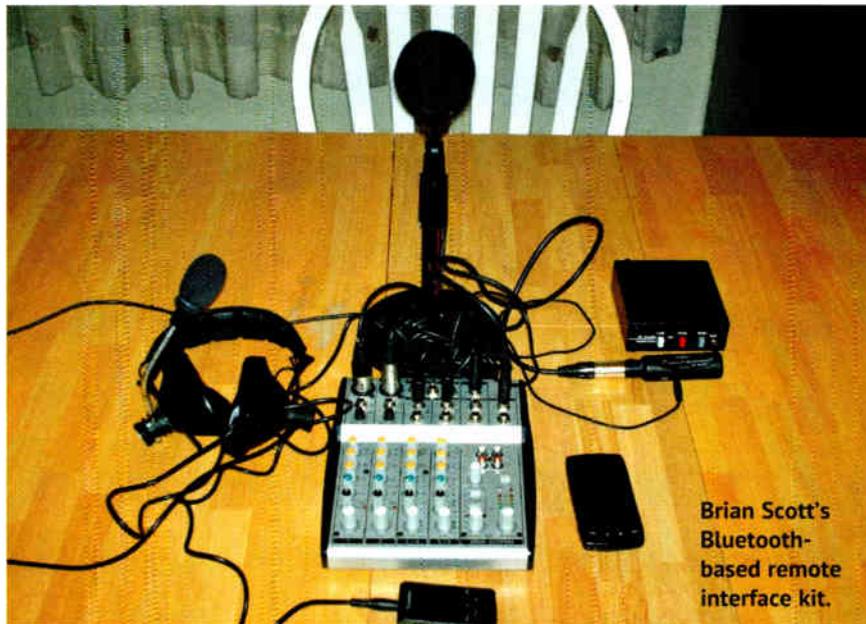
I broadcast quite a few high school sporting events for both 1610 AM XRB, a Part 15 low-power AM serving Brownsburg, Ind., and for www.audiosportsonline.com. The BlueDriver F-3 gives me the capability to broadcast any game in any situation.

In a normal case I use my JK Audio AutoHybrid portable phone when I have an analog line present, but the BlueDriver allows me to use the same equipment setup when an analog line is not available and still produce audio with outstanding clarity and strength of signal.

It also allows me the peace of mind knowing that a reliable and high-quality backup is available if my POTS line decides to act up or is unexpectedly unavailable once I arrive at the remote site.

The BlueDriver F-3 basically is an oversized female XLR connector with a

sary. A stereo cable must be used as the BlueDriver F-3 sends the mic output to the right channel and the Bluetooth return to the left. The signal from the right channel is a little low but adequate for being able to hear if the station



Brian Scott's
Bluetooth-
based remote
interface kit.

built-in Bluetooth transceiver. A 3.5 mm return jack is on the side for line out use.

CONNECTIONS

I connected a stereo 3.5 mm patch cable and fed it back in to my mixer so I could monitor the station when neces-

sary. A stereo cable must be used as the BlueDriver F-3 sends the mic output to the right channel and the Bluetooth return to the left. The signal from the right channel is a little low but adequate for being able to hear if the station

needs to talk to me during the broadcast (a rarity since I do my own production on-site). If your particular needs dictate talking back to the station during every break, I would recommend bringing the patch cable to a headphone amp rather than back to the mixer itself since the mixer is sending the signal out over the air. Care must be taken to not bring the level too high lest feedback occur.

I use a Behringer UB802 mixer for most of my remote work. The 802 has a 1/4-inch main out jack that necessitates using a male XLR-to-1/4-inch patch cable to connect the BlueDriver to the main out jack. The 3.5 mm return is by way of a 3.5 mm-to-1/4-inch stereo cable that I bring to one of my open 1/4-inch unbalanced line in jacks.

After setup is complete, I simply pair the BlueDriver F-3 to my LG Ally cell phone, call the station and we're on the air.

The picture shows my setup: one set of XLR headphones; an XLR mic that is used either for a color analyst or as a crowd mic; an MP3 player that is used to run spots and production from the remote site; and the BlueDriver F-3 using the male XLR-to-1/4-inch adapter along with the 3.5 mm-to-1/4-inch stereo return cable.

Initial pairing of the BlueDriver is fairly straightforward. It pairs like any Bluetooth device would to a phone. My LG Ally cell phone recognizes it as "phone and media audio." To broadcast out, you must put the BlueDriver F-3 in

"phone" mode. Be careful not to change the setting while it is powered as it takes a shutdown of the device to change the setting back. After initial trouble-free pairing, subsequent connections have been a breeze.

Audio sent out through the BlueDriver F-3 has been of consistently higher quality with considerably less noise than if I had simply used a Bluetooth headset paired to the phone itself. The only change I make to my mixer setting is to back off the input levels and the main out. The cell phone itself sends out a loud signal and with the BlueDriver F-3's strength of signal and clarity, I find that I must back my levels off on my mixer. The result is a strong signal with excellent clarity.

RECHARGEABLE BATTERY

The BlueDriver F-3 has an internal rechargeable lithium-ion battery. Specs say it should get a good 14–16 hours of life but I have never used it for longer than 3–4 hours continuously. I've had no issues with battery performance. The unit does come with an external mini USB charger and can be powered via the charger or USB cable during use if needed. So I don't anticipate power becoming an issue.

The BlueDriver F-3's range is spec'd at 33 feet though I come nowhere close to that. Generally, it is always within a foot or two of my phone. Even with only one bar showing on the phone for signal strength, broadcast quality remained clean, smooth and free of any kind of choppiness.

The BlueDriver F-3 lists for \$249. I received it within five days of purchase. I have not found anything else on the market that has the audio quality and flexibility of use for anywhere close to a similar price. There are other Bluetooth units that are an "all-in-one" alternative but are much higher in price. The JK Audio BlueDriver F-3 allows you to use whatever configuration of mixing, recording or broadcasting equipment you may have and use it simply as a method to get the signal out over your Bluetooth-enabled phone. Users can even plug it directly into the bottom of an XLR mic for man-on-the-street or remote broadcasting uses without the need for a mixer.

The system has allowed us to continue to provide an excellent quality of broadcast even in situations where broadcasting by means of a phone line is not possible. It also doubles as an excellent backup device should a POTS line fail, allowing for a simple and quick connection to the board, pairing up with a Bluetooth-enabled phone to get me back on the air as quickly as possible.

For information, contact Joe Klinger at JK Audio in Illinois at (815) 786-2929 or visit www.jkaudio.com.

TECHUPDATE

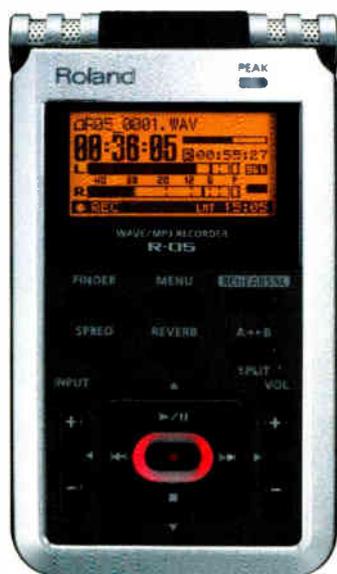
ROLAND OFFERS WAV/MP3 RECORDER

The Roland R-05 handheld digital recorder provides 24-bit/96 kHz audio quality, enhanced recording and editing features and an extended battery life of 16 hours or more of recording time. Its stereo microphone allows direct recording, or sounds can be captured with an externally connected microphone.

The onboard editing features allow for specified regions of audio to be looped, and the playback speed can be adjusted without causing a change in pitch. Rehearsal mode automatically sets the optimum recording level and the R-05 can simultaneously record WAV and MP3 files of the same performance.

The R-05 allows for file transfer with computers via USB 2.0, and also enables users to trim, divide and combine audio files within the recorder itself. For those who desire a high-gloss finish to their recordings, the R-05 is equipped with reverb. The included windscreen and tripod mount enhance placement and help produce better recordings.

For information, contact Roland in California at (323) 890-3700 or visit www.rolandus.com.



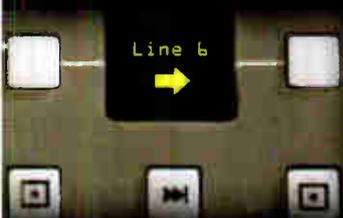


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Codec-in-a-Phone Makes Life Easier

Tieline Shoots and Scores With CHUM on Sports Reporting Remotes

USERREPORT

BY CHRIS LARKE
Broadcast Engineer
CHUM Radio

VANCOUVER, B.C. — As a broadcast engineer for CHUM Radio Vancouver I am always on the lookout for broadcast products that not only make life easier for our staff but for the engineering department. I look for simple, effective and reliable equipment that can be put into use quickly and doesn't have a steep learning curve.

I came across Tieline's Report-IT applications while our department was looking for a solution to solve an audio quality dilemma. One of our morning show hosts is on the road most of the time during the NHL season and he had been going to air using a land line, which of course is not ideal.

Report-IT was one of the solutions we came across. We tried the Report-IT Lite version on various iPhones as well as the iPad and were satisfied that Report-IT would work for us in this situation.

During our test trial we also saw many other potential uses for Report-IT

so we purchased the Enterprise Edition and have not looked back since.

PHONE HOME

Once Report-IT was downloaded to an iPhone, the initial configuration ended up being a breeze. Through the administration account, making configuration changes to such things as user accounts, FTP destinations, codec information (i.e., station-end information) and the default domain settings are straightforward, easy to remember and quick to access. Settings are stored on Tieline's Enterprise Server so I do not have to worry about losing them to any type of system crash back at the station.

To get the audio into the iPhone we purchased adapter cables online for about \$25 each. This allowed for connection of a dynamic microphone and a pair of headphones to the iPhone.

Report-IT has two ways of gathering and sending audio on the iPhone. The first is through the "Report Live" screen, which allows the user to make a live connection via 3G or Wi-Fi to a Tieline codec back at the station. The second way is through the "Record a Report" screen from which the user records, stores and then sends audio (via FTP) back to the station.



rarely have to order Internet connections. We still do "line checks" to ensure that there is a good 3G signal available and that the connection rate is stable. There is the odd time we have had to go to ordering an ADSL circuit and throwing a wireless router on the circuit.

Report-IT has two ways of gathering and sending audio on the iPhone.

We approached our staff to see if there were other uses for Report-IT that had not been thought of. A creative idea now in use came from our production team.

We have a few advertising clients who like to voice their own spots; but scheduling the client's time often is a challenge. The solution was to get the client to voice the spot using Report-IT.

The producer sets up a session time and asks the client to download the Report-IT application. They then log in with an assigned production account; and after a simple tutorial, the client voices the spot as if he or she were in studio. We have found that the quality of the built-in microphone on the iPhone 4 is excellent for this type of voice work.

For our sports reporters, both of these methods have been invaluable when gathering audio from interviews or press conferences and getting it to air long before our competition does.

We have also found that Report-IT is a cost-effective tool when it comes to sales remotes. Thanks to the 3G connection we

For information, contact Mary Ann Seidler at Tieline in Indiana at (317) 845-8000 or visit www.tieline.com.

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In Lübeck, a Remote Van in a Pocket

Mayah Flashman II Helps Small Local German Baltic Broadcaster Sound Big

USERREPORT

BY JULIAN GEBLER
Technician and Music Director
Lübeck FM

LÜBECK, GERMANY — Going live on air from virtually anywhere in this age of the affordable satellite remote van should be rather easy. But for a local

our reporters. We found the Flashman II recorder/codec from Mayah, a “remote van” to put in a pocket.

Instead of the usual poor quality encountered when using a common mobile phone, our reporters equipped with the Flashman II can go live from any location, as long as they can access the



The Lübeck FM portable rig: a microphone and Mayah Flashman II codec/recorder.



A Lübeck FM reporter at work with the station's Mayah Flashman II portable.

radio station, even that can be too much, too expensive.

We at Lübeck FM, a small nonprofit station where much of the work is done by volunteers, were looking for a cheaper and simple solution to be used by

Internet by cable, 3G or any other way. For our programs it means that we are capable of being up to the minute and can bring events right to the listener.

The operation of the units is simple. Presets take care of the right settings

for most any situation. The reporter chooses the phone book entry, presses “connect” and should be connected to the studio automatically. The most important status messages and readings are available on the LCD screen, so the reporter can concentrate on the program contents and still have an overview of transmission progress.

OPERATION

We have found that using the lowest possible bit rates is vital for 3G-based transmission. This ensures a smooth signal throughput and more stable connection.

Of course, depending on the event and location, one may have to share the wireless network's bandwidth with other 3G users. If the required bandwidth suddenly is not there, the sanctity of the transmission is affected. For this

reason we chose use the HE-AAC v2 codec for our transmissions.

We were amazed how good the sound quality was despite of the low bit rate. With just 32 kbps we could achieve perfectly clear connections for the voices of our reporters and nicely maintain the atmosphere of the location. At the same time the delay was still moderate when using these settings, so that reporters could have a real-time chat with the host. To maximize the transmission's reliability it's also advisable to use an additional external 3G antenna.

However, if there is cable Internet service possible at a location we would up the data rate. The transmission quality at the higher rate is the same as any dialogue taking place in the studio.

As the transmission counterparts for the Flashman II on location we use a Mayah Centauri II or Mayah C1141 IP codecs in the studio. Both devices can connect directly with the portable codecs without additional configuration. The stationary codecs in the studio automatically recognize the settings of the mobile device and can synchronize to it, which is a necessary requirement for operation without supervision by technicians.

Other features of the Flashman II are important for its live field work. Using its onboard recorder, reporters can play back prerecorded material such as quotes during the live session. It can also be used to upload recorded files over FTP right to the studio.

For information, contact Daniel Loeffler in Washington state at (360) 618-1474 or visit www.mayah.com.

TECHUPDATE

BROADICAST ENABLES EASY LIVE AND RECORDED REMOTES

BroadiCast is a new Web-based solution to replace live remote equipment.

Using a laptop or smartphone as an audio input, BroadiCast takes the music/sound input signal and encodes it with a custom encoder in proprietary IAM+ format, which promises superior quality at a very low bit rate. The signal is then sent to a custom automated “server.”

The server re-encodes the stream to a universal format (e.g. MP3, WAV) and sends it to the station at the highest bit rate its connection can handle.

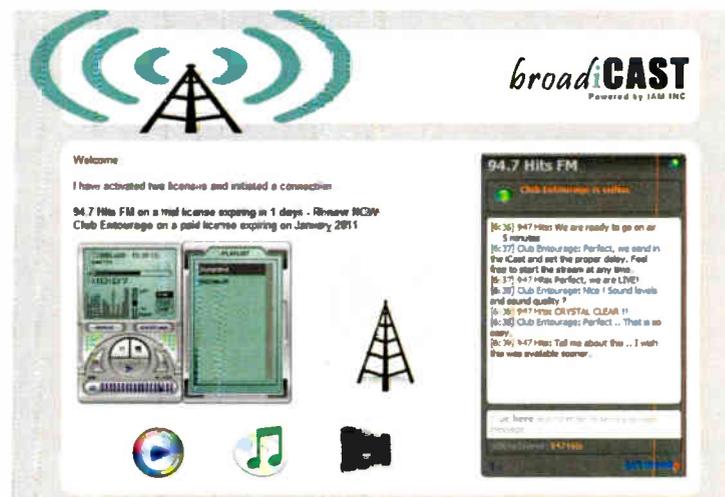
There are no packets or peer-to-peer connections to worry about, eliminating technical set-ups and firewall modifications. According to the company, Internet speed will not affect audio quality because BroadiCast is not using VoIP. High quality is achievable with a dial-up connection, which means a 3G

USB stick could be used to achieve outstanding results.

BroadiCast offers a user-set delay, song recognition and preconfigured “emergency” playback streams that will act as a failsafe in the case of power outages, DJ or presenter mistakes. The server will continue playback from wherever the stream has stopped or go to commercial in case of a human error.

A live chat feature can act as a comms channel and built-in telephony system via which presenters can audibly communicate minus the delay. BroadiCast streams can double as Web feeds for Web radio listeners and can be integrated in smartphone apps.

According to the company, BroadiCast eliminates the use of gear, vans or any sort of equipment other than a laptop or smartphone and does not rely on

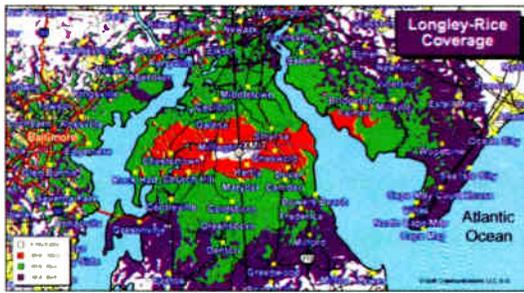


or use a hardwire telephone line. The user simply signs in to a website and clicks “broadcast,” and the receiving counterpart presses “play.”

For information, contact BroadiCast in Quebec at (403) 879-6180 or visit www.broadicast.com.



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Radio broadcasts of Major League Baseball, NFL, and some college football games that are on cassette tapes, approx 100 to 125 games, time period of the entire collection is from the 1950's-70's, asking price of \$1500/BO. Must purchase entire collection. Ron, 925-284-5428 or ronwtamm@yahoo.com.

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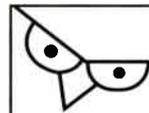
Collector wants to buy: old vintage pro gears, compressor/limiter, microphone, mixing consoles, amplifiers, mic preamps, speakers, turntables, EQ working or not, working transformers (UTC Western Electric), Fairchild, Western Electric, Langevin, RCA, Gates, Urei, Altec, Pultec, Collins. Cash - pick up 773-339-9035

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I'm looking for San Francisco radio recordings from the 1920's through the 1980's. For example newscast, talk shows, music shows, live band remotes, etc. Stations like

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Looking for a broadcast excerpt of a San Francisco Giant's taped off of KSFO radio from 1959, interviews with Willie Mays, Dusty Rhodes & some play by play excerpts, also features a homerun by Willie Mays and Felipe Alou stealing second base, running time is 18:02, also looking for SF Giants games and/or highlights from 1958-1978 also taped off KSFO Radio. Ron, 925-284-5428 or ronwtamm@yahoo.com.

Looking for KFRC signoff radio broadcast from 1930 Andy Potter, running time is 0:22 & also the KLX kitchen the program guest is Susanne Caygill, a discussion of women's affairs with a long promotion for Caygill's appearance at a local store. Anne Truax, Susanne Caygill, running time

is 13:44. Ron, 925-284-5428 or email ronwtamm@yahoo.com.

Looking for KTIM FM radio shows from 1981-1984 if possible unscoped. R Tamm, 925-284-5428 or ronwtamm@yahoo.com.

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READER'S FORUM

IN DEFENSE OF TRANSLATOR NETWORKS

I read with interest the letter from Larry Tighe ("Translator Networks Have to Go," Nov. 3) regarding his thoughts on saving the AM band. His solution does nothing in fact to save AM. His solution is to mess with the FM band. Judging from the number of AMs filing for a translator, most are not interested and some can't find a frequency because of NCE stations.

I see where he has two FM translators in the commercial band re-broadcasting his AM station. Should commercial operators have the whole band? Some appear to think so.

His website is a good one, and it looks as though he has a real good balance of local programming; he even has a preacher on the station. My congratulations for a job well done. But a lot of people would not be served if his idea came to pass.

Some people do not like the mindless drivel heard on many stations just to fill time. Some of the music is not worth listening to; much of the news is anything but fair and balanced and is, in fact, quite distorted or never reported at all. Many listeners like to hear programming that is edifying to the spirit; music that is decent; and news that reports the truth not heard on many network newscasts.

I imagine Mr. Tighe is referring to Christian networks like EMF, CSN, MBN, FLR, TBN, CBN and others that program Christian programming 24/7. Many parts of this nation do not have Christian programming. Does he think Christian listeners should have nothing to listen to? Does his station have listeners who willingly support his type of programming by sending support money directly to him because he does such a great job?

There are hundreds of thousands of radio listeners

and TV viewers who like what they see or hear on translators enough to support their choice of programming. And believe it or not, not all stations or networks are in it for the money.

Most believe in the message they are putting out over the airwaves; and it costs them just as much money to operate as it does a commercial station. The big difference is that they are restricted from selling time in the manner of a commercial station, and are limited to the first 20 channels of 100 on the band. Again, is it greed that makes anyone want it all? What about the NPR and the classical stations? Should they also be forced off the air?

Mr. Tighe, you bought an AM station and I think you probably do a good job. But why don't you learn to live with the restrictions that were in place when you bought your AM? NCE operators have their restrictions; maybe they should be permitted to sell commercials. You should try operating with grants for a year or so, it might be harder than you think. And yes, I do engineer for both NCE and commercial broadcasters.

*Jim Teel
Roswell, N.M.*

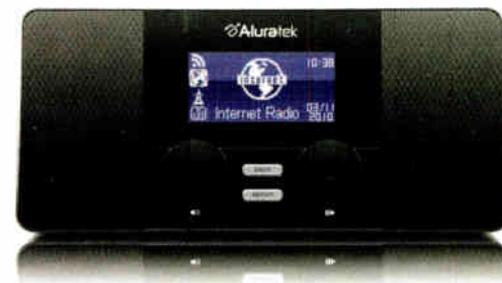
I LOVE MY ALURATEK

Leslie, thanks for the great article "Internet Radios Are Stocking Stuffers" (Dec. 1).

I wanted to bring to your attention a new line of Internet radios manufactured by a company called Aluratek (I am not associated with the company).

I became an "at-home" dad after the radio agency I was working for closed, and became tired of having to turn on the computer to listen to various streaming entities such as CBC, WJR, WKSU, etc.

I discovered this Aluratek Internet Clock radio, model AIRMM02F. J&R Music in New York City had it on sale for \$77. I couldn't be happier. Great sound, remote, Ethernet connection (though I use Wi-Fi), USB jack for



MP3s, vTuner (which makes programming my radio very easy), FM, etc. Check it out; they have another model available too, and both list for about \$100.

*Jeffrey Jacobsen
Collegeville, Pa.*

THE FOLKS BEHIND THE VOICE

I am not an engineer, just a 32-year broadcasting veteran (mainly in production), but I found Joe Buch's letter "My First Radio Remote" in the Nov. 17 issue *soo* cool.

I couldn't match meeting and hearing mob-busting Governor Dewey, but the principle's the same. I dragged my mom to a WISM(AM) (Madison, Wis.) remote; seeing the voice behind the radio was like the coolest thing I had ever seen.

The guy — Robin Steele, I think — was doing his whole show from either a men's clothing store or an appliance store; and it was truly the neatest thing a 13-year-old could see. It's probably what got me into radio in the first place.

Now at 53, I still haven't lost the fascination of meeting folks behind the voice. What a great letter!

*Mark Ward
Production Director
Cumulus Wilmington
Wilmington, N.C.*

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What's Next in Radio Technology?

Insights From Wheatstone's Recent Study

COMMENTARY

BY JOSH GORDON

With the hunt on to find business models to replace declining ad revenue, it is not the most advanced or coolest technologies that will succeed but the ones that support winning business models.

This does not diminish the importance of tech, because every new business model being put to test is powered by a new enabling technology. How will your station make money in the coming years? A second HD channel? Streaming content over the Web? Sponsored podcasts? Social media?

All are powered by technologies to which the radio market did not have access 10 years ago.

The idea for the Wheatstone study "Revenue-Generating Radio Technologies: A Progress Report" was to ask the people implementing these revenue-generating technologies — yes, the tech people — how the process is going. This study got people thinking, which was what we were hoping for.

Here are five things we learned:

1. Radio Is a Divided Camp Over the Profitability of Streaming — The most discussed finding was about radio stations streaming programming over the Internet. Of the 10 revenue-generating technologies we measured, respondents picked streaming as both the most frequently used and the one with the most revenue potential (Fig. 1).

When the study was reviewed on blogs and articles, readers responded. Posts to trade publications discussed whether streaming could be profitable given the expense of music license fees. Comments on Jaye Albright's Breakfast Blog discussed how to consider the expense of paying for each listener's bandwidth.

Paul Thurst wrote on his Engineering Radio blog that if stations don't make streaming work, someone else will: "One thing that Internet sites like Pandora have shown, radio broadcasters cannot sit back and be content with the status quo. Without technical innovation and some outside-of-the-lines thinking, radio will be bypassed by newer, more interactive media services." And yes, some just loved the finding, with the Triton Media blog calling the study a "must read."

This divide over streaming is documented in the chart in Fig. 2. Here we see both standalone and group-owned stations affected.

A little more than one in four respondents say they are making money charging for advertising right now, with another third believing they will be doing so

money for your station unless they are combined with the right tools to monetize them. You need to have the right people, resources, technology training, sales training and company-wide education. For example, what good is a large investment in streaming going to do for you if your sales force is not prepared to properly sell it?"

Selling ad space for a streamed product is very different. The bad news is that the station cost structure is different, with expense added for every listener. The good

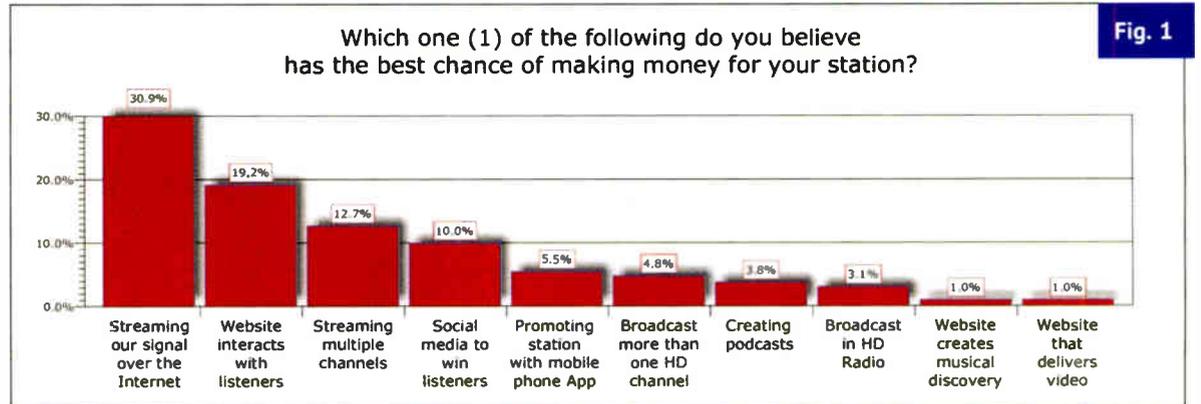


Fig. 1

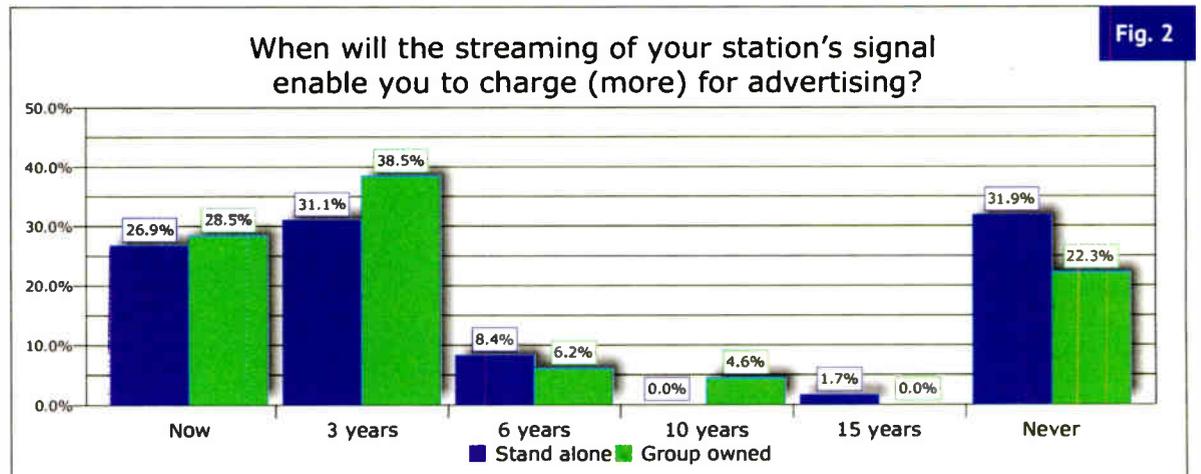


Fig. 2

within three years. But as the timeline extends to six, 10 and 15 years out, the numbers drop to single digits. Finally, more than a quarter of respondents believe their station(s) will never be able to charge for advertising on streamed content.

From a research point of view, it can be uncommon to find this kind of an opinion divide in an audience that shares many other common values. How can it be that so many are making money at this now, yet many believe they never will?

Gary Kline, vice president of engineering and IT at Cumulus Media, in a quote from the study, puts this into perspective: "None of these technologies will make

new is that the media sale is different; media salespeople can go on calls with far more data about your listeners.

2. Three Years Out, More IT Networking Is Coming — We used the "three-year-out" metric in several questions because it is an unofficial high-tech research yardstick. Beyond three years, advancing technology, rising processing speeds and lower storage costs add too much uncertainty for accurate predictions.

Group-owned stations are advancing more quickly but standalone stations are not far behind.

That said, three years out there will be more auto-

(continued on page 38)

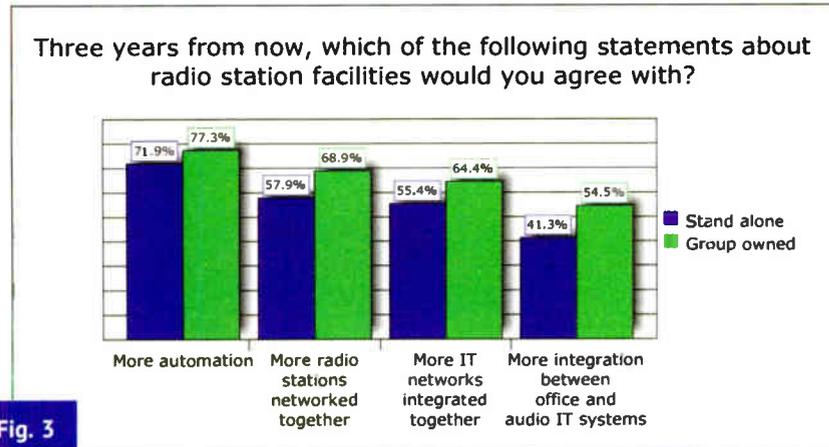


Fig. 3

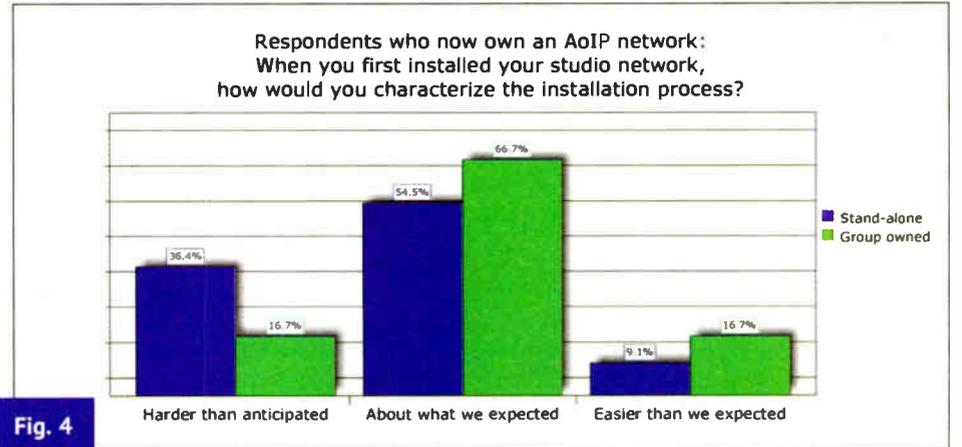


Fig. 4

NEXT TECH

(continued from page 37)

mation; more audio consoles networked together; more radio stations networked together; more IT networks at stations integrated together; and more integration between office and audio IT systems.

Fig. 3 is one of the “three-years-out” charts from the study.

3. AoIP Is Not Always Living Up to the Hype — Many stations have found AoIP networks to be more challenging than anticipated. Over a third (36.4 percent) of respondents from standalone stations with AoIP networks found installation “harder than anticipated.”

By contrast, group-owned stations, where AoIP experience can be borrowed from a central IT department or another station, found installations far easier, with only 16.7 percent finding installation “harder than anticipated” (Fig. 4).

In the study, Mike Cooney, vice president of engineering and chief technology officer of Beasley Broadcast Group, confirms this with an experience of his own.

“My first (AoIP) installation was about five years ago. It was probably one of the first installations of its kind and it did not go smoothly. It was a learning curve on our part, and on the manufacturer’s part, as it was a new product. [Installing] the same exact system a year ago went absolutely smooth with no troubles at all. Neither system caused any problems after it was installed, but the first installation was harder because of the learning curve.”

Another surprise came when we asked stations with AoIP networks if they had latency problems. Standalone stations, whose systems tend to be smaller, had fewer issues, but one in three group-owned stations reported latency problems (Fig. 5).

Latency, or audio delay, can annoy talent when their voice in their headphones has a delay as they talk. It can become more than an annoyance when it interferes with an automation system. Latency can cause ad spots to be dropped and satellite feeds to be missed.

4. Within 15 Years, Tech People Believe a Majority of Listeners Will Be Via the Internet, Not RF — As we look ahead, for every few years we measured we found a few more respondents who believe that their stations would have more listeners from their Internet stream instead of their RF signal.

Although the number of respondents picking streaming was small, with each passing time unit they added up. When we total the number of people who believe they will have more Internet listeners within 3, 6, 10 and 15 years, combined they became a majority. Within 15 years,

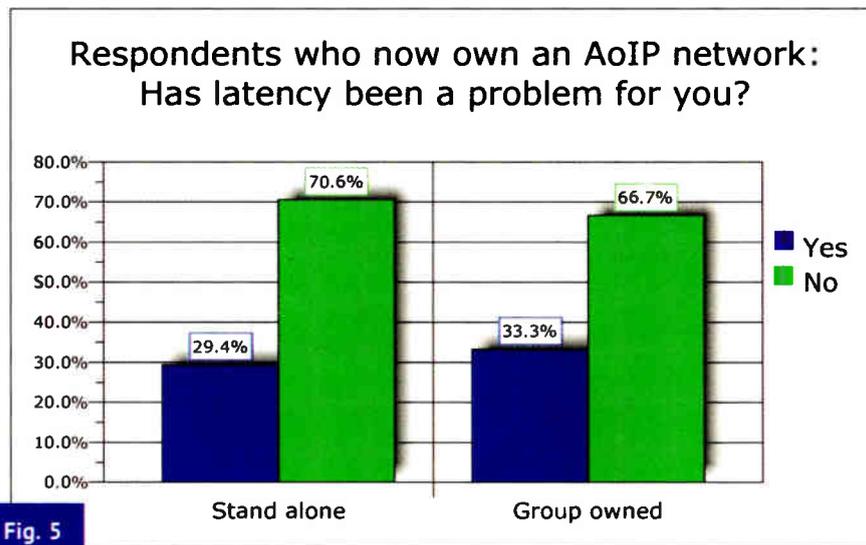


Fig. 5

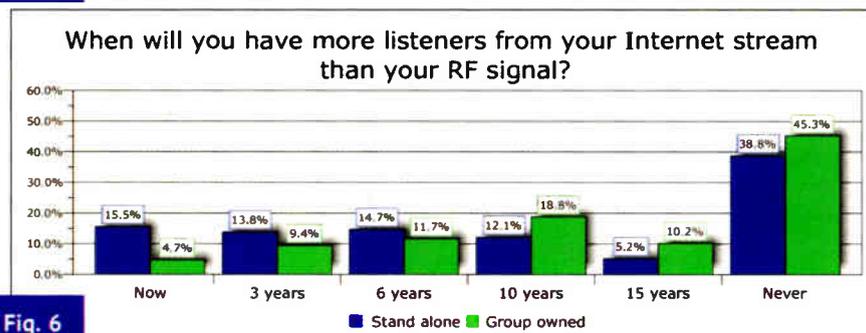


Fig. 6



Fig. 7

61.3 percent of respondents from standalone stations and 54.8 percent from group-owned stations believe they will have more online listeners than over the air (Fig. 6).

5. Nevertheless, Transmitters Will Stay On — Despite the above, very few respondents believe their transmitters will be turned off. Keeping transmitters going will give stations a competitive advantage over online-only radio. Roughly 76 percent of respondents believe they will never turn off their transmitter (Fig. 7).

In the study, Mike Cooney agreed with the majority and raised a further question: “Which transmitters?”

“There may be a time down the road when we turn off our analog signals but continue with just our digital signals,” he said. “We will have multiple channels of digital and may make as much money transmitting data services as we do from our radio product. Because there is a lot of bandwidth in the HD signal, there could be many different

services, such as the Broadcaster Traffic Consortium, where we transmit traffic data on the HD signal. By then, there could be many other kinds of data services we could be taking advantage of.”

Other radio-delivered data services could include text-based information such as song titles and artist names, weather updates, movie listings, sports scores, stock quotes and school closings.

In conclusion, many changes are coming to the tech side of radio; there is no shortage of opinion as to which of these revenue-generating technologies will win out. But radio tech people are a passionate group and have confronted change before.

Many non-tech people might prefer to sit on the sidelines and wait for the winning technologies to emerge. Programming guru and blogger Mel Phillips, after posting on the coming changes outlined in the study, commented, “Welcome to the world of technology. I’m glad I chose programming ...”

Comment on this or any article. Write to radioworld@nbmedia.com.

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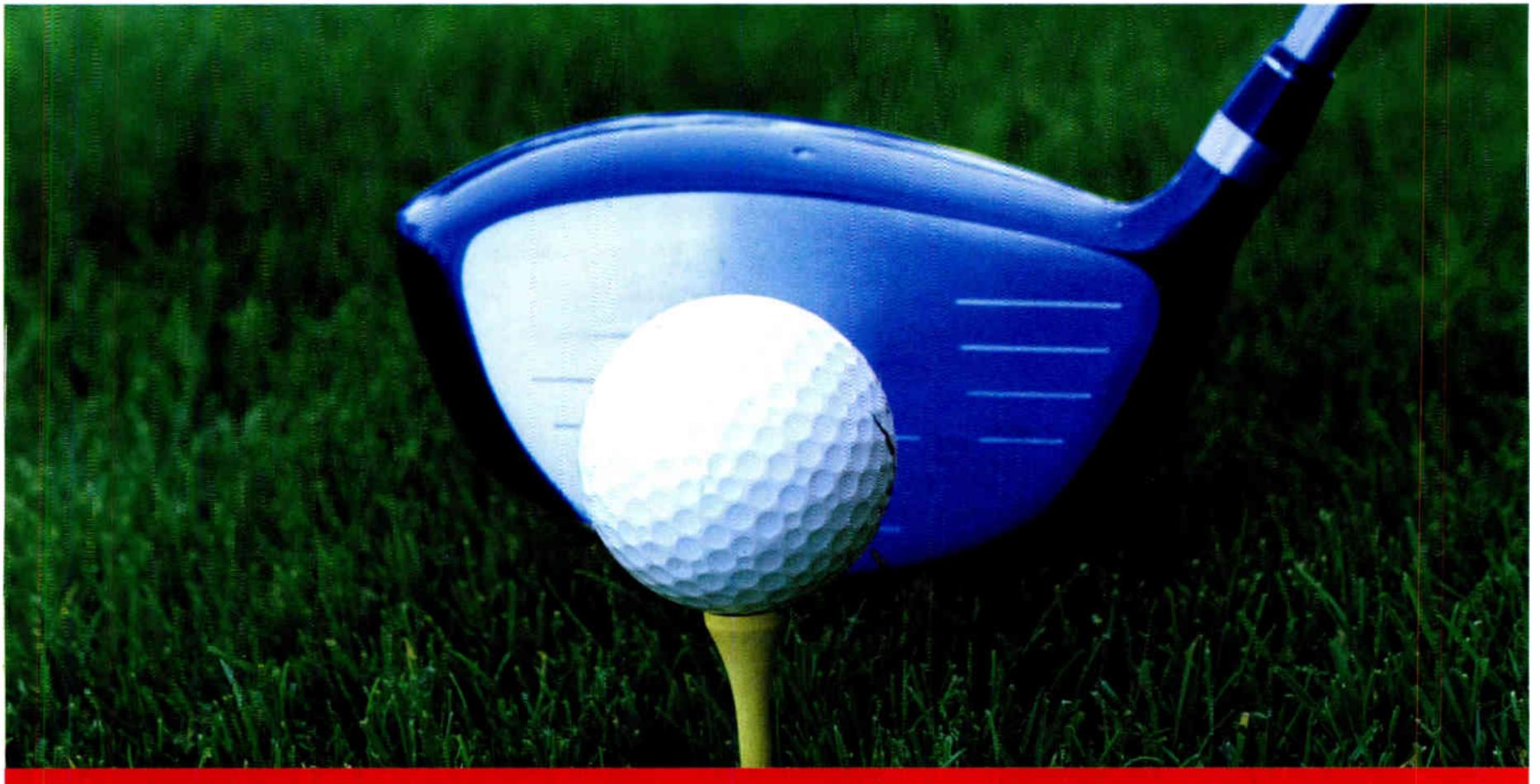
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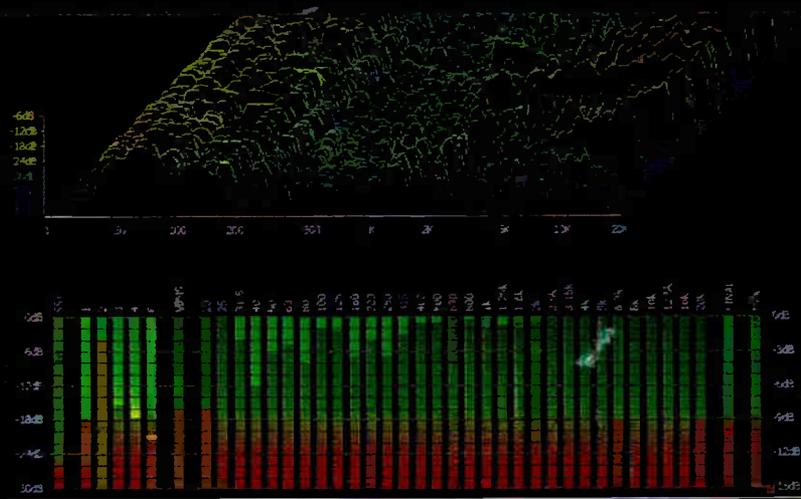
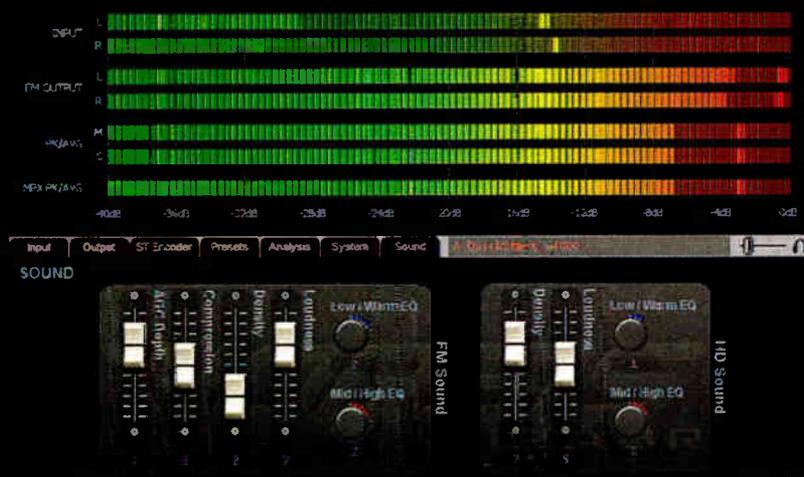
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"The music sounds great, and this box can be tweaked to anyone's preference. There is a lot to discover in this machine....but our single biggest achievement has been achieving the clearest, cleanest 'voice' I have ever heard come from an FM processor."

"I am extremely impressed with the unit's capabilities and how well it performs with our NPR talk/Classical format"

Real Comments From Real Users About Vorsis

Just wait until they get their hands on AirAura™



phone 1.252.638-7000
www.vorsis.com | sales@wheatstone.com

"What an amazing difference in sound quality!!! This is a brand new FM station and comparing it to the other new station in town using the Other brand of processor our client is louder, cleaner, and even legal. Wheatstone definitely has a winner here with Vorsis."

"This is a great sound and we are so, so pleased with our new Vorsis on-air processor. You just threw down the gauntlet to the processing industry with this new unit! Nobody can match a sound this loud, this clean, and this unique! Now everybody gets to chase after us for a while. Thanks Vorsis!!"

"Our signal used to virtually disappear in downtown New York when we went on night pattern because of the extremely high level of man-made noise. Now when we're on night pattern our coverage in downtown is actually better than when we are on day pattern, the other brand of audio processor and a 10X higher powered transmitter! We're buying a second one to put on our daytime transmitter!"

"You have to be kidding! I have NEVER heard FM audio sound this good, this detailed, this smooth, this clean, and this loud (how did you do it??). Very nice work!"

"Love the box!!! Overall the sound of the station is vastly improved. It's loud, wide and clear."

"I guess the only word for Vorsis is 'WOW.' It's got some great bottom end, and it's more transparent than any processor I've heard."

"The AGC/Compressor/SST combination is simply amazing. We play classical CDs. Older classical CDs were mastered at a much lower level than current ones. Announcers don't compensate and never will. Your processor is able deal with what amounts to probably 40-45dB (or more) "average" level variations and hold them perfectly in the sweet spot with virtually no squashing, pumping, sucking, or other usually audible artifacts of such wide range level control. In short it does its job perfectly every time."

"This box sounds much better than any other processor I have ever tried. Ever!"

"I love classic rock and it's the program format on the station that I own. No other processor that I've tried (and I think I've tried them all!) sounds as good on this format. We're nice and loud and still cleaner than the other stations in the market. We were surprised to hear the intentional dynamics of songs actually get on the air - other processors just flatten them out or turn them into a sea of mush. For the first time ever we're also hearing subtle nuances in songs that we used to think we knew every single note of. What an amazing air sound! No... What an amazing processor!!"

"The SST algorithm is the least audible of ANY processor I have ever had experience with. I'm not sure how you did it or exactly how it works but its automatic "leveling" is excellent - no pre-processing whatsoever is necessary with SST."

"The high end of this processor is very open sounding - there is no fake "sparkle" with the HF EQ either. Perfectly clean and natural sound. And did I mention LOUD?"

"Your equalizers are actually useful and unlike other processors do not grunge-up the sound merely by enabling them."

"Finally! A processor that deals effectively and transparently with overly-sibilant announcers and audio levels that usually go all over the place! (I especially love the tweak-able multi-band thresholds!)"

"Why haven't the other audio processor companies been able to make an AM box that sounds this good? I can't think of a positive superlative that is big enough to describe how pleased I am with our AM sound now. Our coverage seems to have increased by quite a bit too!"

"Our multipath is Gone! GONE! As an engineer I have difficulty believing a processor can make this much difference in apparent coverage area but the listening is the proof. We've had several listeners call and comment that their reception has greatly improved and even I've noticed vast improvements when driving through what were previously horribly multi-path prone areas. I'm not sure why, but it sure does work!!"

"This box has great metering and excellent analytical tools - you get good visual indication of everything that is happening inside."

"The unit's stability has been flawless, not even a tiny glitch. We have it set up to time-sync and it works great. The scheduler-based (and SILENT!!) preset switching is perfect! Unit sounds very accurate sonically and is very easy to set-up."

"We are now VERY unique in our audio. Compared to other stations in the market, we are as loud yet maintain legal modulation (at least 4 stations in our market run with 130%+ modulation). We're not "squashed" sounding at all and if you compare us with the other stations (all formats) we're clearly a dynamic and clean stand-out signal on the dial now."

NOTE: We aren't naming names because everyone who is reaping the rewards of sounding better appreciates their anonymity (with respect to the competition). We won't blow your cover, either.