



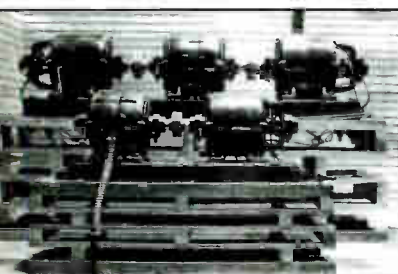
RADIO WORLD

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Richard Arsenault: Champion of AM Radio

He Has Pushed for Regulatory Changes, Though Success Hasn't Been All He'd Hoped

BY RANDY J. STINE

FORTESCUE, N.J. — Richard Arsenault knows AM radio is slipping in popularity as media consumption

NEWSMAKER

fragments. He believes it's a matter of time before more small-market AM

broadcasters meet their financial doom during challenging economic times.

That's why the consultant and former AM station owner in 2010 asked the FCC to consider two petitions for rule-making: one to allow a power boost for AM licensees, another to allow for AMs to begin pre-sunrise service earlier. The FCC rejected the power increase idea, citing interference concerns. It has yet



Richard Arsenault, right, is shown on a job with Terry Dalton of Stellar Communications.

to act on the pre-sunrise service request.

The proposals drew new attention to Arsenault and positioned him as something of an advocate for downtrodden stations, particularly AMs.

"Due to the exponential growth in competitive digital technologies and the ever-increasing interference from those devices, AM radio needs all the help it

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An Unscheduled Inspection

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Shapiro Takes His Plan to the Book Circuit

Government Should Foster Change, CE Leader Believes

BY LESLIE STIMSON

WASHINGTON — Gary Shapiro is a first-time author who says the U.S. economy is going in the wrong direction. Asked why he decided to write a book, the long-time president/CEO of the Consumer Electronics Association replied: "We elect politicians to make tough decisions and they're not making them. I'm pretty distressed about it. It's going to affect our kids."

His book "The Comeback: How Innovation Will Restore the American Dream" was released by Beaufort Books in January.

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SHAPIRO

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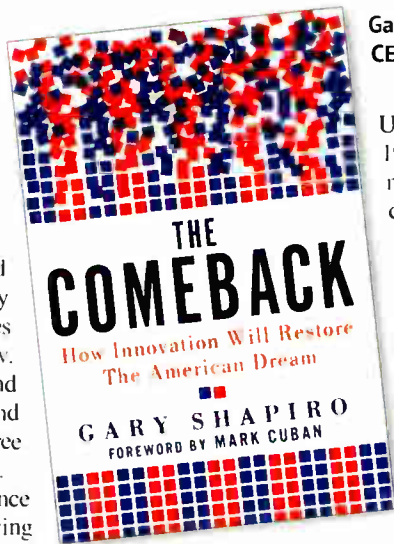
Shapiro believes the U.S. economy has "taken a horrible turn" since 9/11 and that he provides a blueprint to help the economy recover and reestablish the United States as a world leader.

"The U.S. economy has a very challenged future based on government policies. The only way we can get out of it is to change the policies and focus on innovation," he said in an interview.

He said innovation creates jobs, markets and new industries, but requires attracting the best and brightest students, as well as investment in the free market, free trade and the availability of capital.

The tightening of America's borders since 2001 is not good for business, he says; denying citizenship to top university students "is an insane policy if the U.S. wants to keep pace with the rest of the developing world. Most countries gladly take the engineers we don't want," he writes, though Shapiro adds he is not advocating the nation drop all immigration restrictions.

He would change a policy that treats all foreign nations the same in terms of visa quotas, and he would like to see a special category created for bright and gifted students to obtain visas. He would adopt policies to encourage the best university students to stay in the United States once they get their degrees.



Gary Shapiro's book went on sale in January. CES convention attendees got first crack.

U.S. science and tech companies founded from 1995 to 2005, the chief executive or lead technologist was foreign-born: of those, 52 percent came here as university students.

Shapiro said that the same study found there are more skilled workers waiting for a U.S. visa than can be admitted under current law, which, according to the study, allows about 120,000 available visas a year, with no more than 7 percent allocated to immigrants from any one country.

After Sept. 11, 2001, Shapiro writes, "We pulled back the welcome mat and put up real and perceived barriers to the world's educated people who previously would have

studied or created companies in America. Today, other nations welcome these students, entrepreneurs and engineers."

The next Bill Gates likely will come from India or China, Shapiro predicts.

CUTTING 'UNTIL IT HURTS'

Among his suggestions for turning around the economy are drastically cutting government spending "until it hurts" and restoring "sanity" to the country's fiscal policy. Lawmakers also must open American products to untapped markets worldwide

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He cites a 1999 University of California Berkeley finding that engineers from China and India ran 24 percent of U.S. technology business launched in the previous 18 years. Also, a Kauffman Foundation study in 2009 found that, in a quarter of



Shapiro, left, was presented with a buggy whip by Fred Jacobs at the Jacobs Media Summit in Baltimore. Shapiro had been quoted saying radio was acting like a "buggy whip" industry by pushing for an FM chip requirement in cell phones. Jacobs had responded in a blog headlined "Buggy Whip, My Ass!"

by passing free trade agreements, according to Shapiro.

He says the country should stop penalizing investment in startups by lowering corporate tax rates so that private venture capital will again flow to U.S.-based companies; he says half of that capital goes to foreign-based firms.

But government should not give any company, large or small, a financial bailout; he writes that efforts to rescue Chrysler and GM "wasted billions in taxpayer funds and since their debt was also wiped out, they have little incentive to invest. Lawmakers should make sure business taxes are transparent and predictable, change the tax laws to favor investment over debt and our country should make economics, business and entrepreneurship studies compulsory."

Technological innovation isn't always easy because it "changes other industries, and not always in pleasant ways. In fact, sometimes technological innovation destroys," Shapiro believes. He mentions typewriter mechanics and travel agents as examples of job categories that have largely fallen by the wayside because of such changes.

Change threatens the status quo and old industries fight back, he writes, using broadcasters as an example.

"Rather than adapting, the broadcasters often meet new competitive threats by lobbying government for more protection." He describes broadcasters' drive to mandate an FM chip in cell

(continued on page 5)

Nautel Seeks the Long-Term View

Conlon's Strategy Is to Address Radio's 'Three Significant Challenges'

Equipment manufacturers are a bellwether for the technical direction and health of the radio broadcast business. From time to time I like to check in. This conversation is with Peter Conlon, president and CEO of Nautel Ltd.

McLane: What are the biggest challenges facing radio broadcasters, and what technologies is Nautel advocating to address those needs?

Conlon: In our part of the business, we believe that radio broadcasters face three significant challenges right now.

First, there are fewer and fewer young engineers getting into the radio broadcast business. When you couple that with CEs and other technical staff leaving the industry, it points to a talent crunch.

Second, this talent crunch is coming at a very awkward time. Broadcast equipment, particularly in the digital world, is becoming more complex. So just as the talent pool is shrinking, the job is getting tougher.

Finally, all broadcasters are facing tight budgets; both capital and expense. So it looks as if fewer people, with less money, are going to have to do more difficult jobs. Quite a picture.

We think it is essential for Nautel to bring a whole array of technology to address these needs. We need to continue to develop products that are reliable and robust, with high levels of redundancy, and which are easy to install and maintain. That way, we minimize demands on an engineers' time.

We also need to simplify the move to HD Radio with software offerings like



HD PowerBoost, as well as rock-solid hardware such as Importer Plus and, of course, Orban Inside. The more connection points, cables and hard drives we can eliminate, the easier the job gets.

Finally, our most important new technological approach shows up as our AUI – Advanced User Interface. However, it's not just a user interface. It actually embodies a control system with measurement points and built-in instrumentation that can be operated from anywhere in the world, over the Web. And, in the future, it means that new, value-adding functionality can be added to the transmitter simply by downloading software, again, over the Web. Engineers can diagnose a prob-

lem without the commute, and Nautel's customer service engineers can assist, all via IP.

McLane: Nautel calls itself a specialist in high-power solid-state radio transmitters and RF amplifiers. Is that a growth business?

Conlon: I think of the RF spectrum much like oceanfront real estate. You can't make any more of it, so the bit that exists will always have a high intrinsic value. Someone will always broadcast.

I believe our skills at designing highly efficient, highly reliable, small-footprint RF transmitters will allow us to develop products that will be always valued in that space. We've just begun

FROM THE EDITOR



Paul McLane

to see the growth that exists for us.

McLane: What is Nautel's annual revenue? Where do you anticipate growth will come from?

Conlon: As a private company, we don't publish our revenues. However, I'm pleased to say that we continue to be profitable, have doubled the size of our business in just the past four years and our new orders for 2010 were up 40 percent over last year. Our 200 employees are kept pretty busy.

We're excited about both the domestic and international markets right now. For years, Nautel was a well-kept secret, only for those in the know. Today, Nautel is no secret; we've invested heavily in our sales and marketing teams and continue to do so, making sure that we are considered in every project and tender worldwide.

Now that the recovery is in motion, we're hoping to see growth in all our markets.

McLane: Nautel is an advocate of asymmetrical sidebands to allow increased digital radio power. What lessons have you learned from first adopters? When do you expect full regulatory approval?

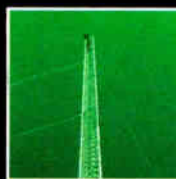
Conlon: We have to give the credit for asymmetrical sidebands to our customers. They told us the challenges they are facing, and we listened, and then invested in R&D to help our customers solve them. Nautel has always been an engineering-led company, and a major

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Disappointing Audio Broadcast

This is a call for all members to put pen to paper and send the UK Government a Strong Clear Signal I am asking you to write a letter to your MP and lobby them to hit the alarm for the analogue radio switch off which is targeted for 2015. This is a totally unnecessary move to force the change to digital radio without any real benefit to anyone other than the leading DAB radio industry and profitless commercial broadcasters. We expect to see the eventual switchover but we can make it clear that this is not the time to do it, not the correct system to use. Below are the most salient points that you should make very clear in your letter. The Government are actually looking for

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SHAPIRO

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phones and other devices an "absurdity that penalizes the innovation of the cell phone with the antiquity of the FM radio and antennae."

In contrast with broadcasters, Shapiro says, the cable industry innovated when satellite came along; he says cable survived because it expanded to embrace the Internet and "quickly became the broadband provider to most of America."

He cites Ford as an example of innovation because it has chosen to define itself as a car technology company, "a huge shift for them," with its Sync communications system; he also credits the automaker for choosing not to take government funds like GM and Chrysler.

The author describes himself as a pragmatist who pushes for government to be less involved in business. He believes his plan is common sense but is likely to anger partisans of both the main political parties. "Democrats argue for more government spending and programs. Republicans argue for lower taxes," he writes. "We are in a crisis, and it won't be fixed simply by more government spending or by cutting taxes. Our best hope is for government to foster innovation by creating a fertile ground for innovation to flourish."

The head of CEA has been involved with consumer electronics for more than 30 years, beginning as a law student in 1979; he was part of a group that represented VCR makers and retailers when Hollywood studios sued them, claiming the devices violated copyright laws and that consumers should not be able to record movies and TV programs. The VCR makers prevailed and Shapiro went to work for the association full-time.

Shapiro considers himself an independent. Asked if the book indicates an interest in elected office, he replied that he loves his job and can't think of a better one in Washington; he said his position involves an alignment of what's good for the electronics industry, what the CEA board supports and what he believes in.

RADIO

Shapiro devoted one paragraph to radio in his book, but his few comments were in line with what he's been saying lately about the industry.

At the Jacobs Media Summit in December, Shapiro said NAB's push for an FM chip mandate is misguided and predicted it would fail. He said the suggestion makes radio look old, weak and ineffective, hence his comment that radio was acting like a "buggy whip industry."

The recent Congress was not interested in voting for a mandate, he said; in subsequent remarks to Radio World he

predicted a mandate would not pass during the new session of Congress either.

He has disputed broadcasters' argument that consumers need access to radio stations on their devices in an emergency because they can use their phones. NAB has said cell networks sometimes fail during emergencies.

Shapiro praised NAB President/CEO Gordon Smith as "a savvy senator" who brought up the FM chip issue as a way to divert performance rights legislation. But this strategy, Shapiro said, "makes radio look like it needs a government handout." An NAB spokesman declined

comment on Shapiro's remarks.

Asked how radio can innovate, Shapiro said HD Radio "looks promising" despite its "chicken-and-egg" challenge. Car makers, he said, are embracing the technology.

Regarding increasing competition for radio in the dash, Shapiro believes radio remains dominant there but warns that wireless capability is coming to cars, built into the dash and in aftermarket products. Thousands of companies will try to get audio content into the automobile, he said; these "clearly" are competitors for radio.

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ARSENAULT

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can get," Arsenault said.

DUAL CITIZEN

The 57-year-old now works as a broadcast radio consultant specializing in acquisitions and broadcast technologies. His namesake firm is a virtual clearing-house for a variety of broadcast services, ranging from FCC feasibility studies and preparation of commission exhibits to hands-on studio construction and transmitter installation.

"I find great satisfaction in finding creative cost-effective solutions for many smaller AM, FM and LPFM station operators. Unlike larger corporate stations, I frequently get to work directly with the station owner and enjoy that personal friendly interaction," Arsenault said.

He was born in Montreal and moved to the United States when he was 10, after his father took a position as a high school history teacher in Champlain, N.Y. Arsenault, of French-Canadian descent, became a naturalized U.S. citizen in 1971. He holds dual citizenship; under a newly revised naturalization law, Canada also recognizes him as a citizen by birth.

His interest in broadcasting was demonstrated when he built Part 15 transmitters as a youngster; he also assembled studio equipment out of old parts and built an amplifier for his electric guitar. "I was ripping radios apart for parts."

Arsenault's first radio job was as a disc jockey at WDV(L)FM in Vineland in southern New Jersey in 1972. His first big break in the broadcast engineering



'AM radio needs all the help it can get,' says engineering consultant and former station owner Richard Arsenault.

business came several years later when WMVB(AM/FM) in nearby Millville hired him as staff engineer.

In the early 1980s, Arsenault traveled to Beaumont, Texas, to work for Lamar University as chief engineer for KVLU(FM). He also worked as technologist for media services for the College of Communications at Lamar.

Arsenault has his Bachelor of Science degree from the University State of New York, now known as Excelsior College. But he received an education of a different sort when he joined the staff at the consulting firm of Jules

Cohen & Associates in Washington in 1982.

"That was where I gained valuable insight into radio and television feasibility engineering studies and preparation of FCC applications. It's a very professional organization and was a great educational experience."

By the late 1980s and into the mid-1990s Arsenault was involved with many radio stations as chief or contract engineer; by his count, at one point he was in charge of engineering services at 14 stations. Then in 1994 he took the opportunity to purchase one: WREY(AM), the Millville station where he'd begun his broadcast engineering career in 1974.

Arsenault eventually brought back its WMVB call letters and performed just about every job inside the radio building.

"It was a terrific experience. I was general manager, sales manager, chief engineer, talk show host and more. I have a lot of respect for what a GM does. I find that the technical side is easier."

TRYING TO SURVIVE

Arsenault, a member of the Institute of Electrical & Electronics Engineers (IEEE) since 1982, sold the radio station in 2000 to Quinn Broadcasting and has since focused on his consulting business.

He is based in Fortescue, on the southern coast of New Jersey along the shore of the Delaware Bay. Arsenault works mostly with small and medium-sized broadcasters along the eastern seaboard.

"I feel like I can come in and really make a difference and be helpful to small broadcasters in many ways. Many are just trying to survive in the world today. The diversification of media has brought on an onslaught of media choices," Arsenault said.

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"Many small broadcasters are struggling while some are doing a little better than imagined."

The kind of thing he notices when visiting smaller broadcasters is lack of attention to the required public inspection files, which often are incomplete. This can lead to fines.

"It's pretty basic stuff usually. I give (owners) technical advice on everything from maintaining EAS equipment to tower lighting issues. I understand what a lot of broadcasters are facing today. They are easily distracted from some of the simpler compliance issues because they are so preoccupied on just surviving day to day."

Arsenault filed his petitions for rulemaking with the FCC last summer to help broadcasters, specifically AMs, through tough economic times. But the process is challenging. "Today the FCC appears bogged down in too much red tape to quickly make changes to help some broadcasters."

AM suffers in part from increased electromagnetic interference, one reason Arsenault advocates a power increase. "What were once usable AM signals in areas are now unusable signals in many areas. To increase the ratio of the desired stations to the unwanted interference in theory seems to make sense, but the commission dismissed it. A resolution is not simple," he said. He'd hoped for a ten-fold daytime power increase, or at least a four-fold hike.

He believes the FCC officially dismissed his power increase petition before it was adequately publicized, which minimized the number of comments filed by the public. He concedes too that under his ten-fold proposal, it was unlikely that many small-market AM stations would or could invest to upgrade unprofitable facilities.

His pre-sunrise proposal received a number of con-

ments, all "100 percent in support of my petition," he said.

Regarding other efforts to help AMs, he is under-impressed with the state of AM HD Radio. He decries what he describes as hash and noise of nighttime AM HD and says the format reduces coverage areas of stations significantly.

"The result, from trying to help AM, is actually hurting it," Arsenault said.

However, he sees the surge of AM stations using FM translators to improve nighttime reach as a great benefit. According to BIA/Kelsey's "Investing in Radio Market Report," more than 400 AMs now are rebroadcasting on FM, which is about 8 percent of AMs in the country.

"Back in 1989 I filed a petition for rulemaking to allow AM stations to use FM translators. The FCC dismissed it without prejudice back then because it was a bit premature, but it is helping many AM broadcasters now," Arsenault said.

It was an NAB petition, filed in 2006 for cross-service translation, that finally gained FCC approval in 2009. The association lobbied hard for AMs to rebroadcast on FM translators, saying this change would mitigate coverage problems and promote competition, diversity and localism.

NEW BAND

Arsenault envisions a number of low- and medium-powered AM stations eventually migrating to a new band created by extending the bottom of the FM dial by 6 or 12 MHz.

"If a plan were undertaken to move a portion of existing AM stations into an expanded FM band or

other new band, the remaining stations could easily upgrade power ... to more effectively compete with stations in the FM band.

"The whole concept reduces the number of AM stations, cleans up the AM band and fills it with solid signals making radio a whole lot healthier," he continued.

"I suspect down the road that if a majority of existing AM stations are relocated, the FCC might renegotiate with Canada, Mexico and other nations with existing radio interference agreements to possibly open up higher-powered AM domestic operations. Stations could easily upgrade to 500,000 watts and profit from covering multiple states."

Arsenault also has started a series of free broadcast career tests on his website (www.radio-broadcast-engineer.com) that range in theme from radio sales and marketing to general management and computers.

"Although these tests cannot replace the value of certification available from professional broadcast organizations, the tests have potentially unlimited use to those in broadcasting and others potentially interested in radio or television. Someone might use the tests to help them determine specific areas in broadcasting that they might need to brush up on."

As for small broadcasters competing against all sorts of new technologies, he remains optimistic about those who continue to provide important local community service.

"They will survive. Those stations that play primarily music and are not interwoven into the fabric of their communities will likely feel the greatest impact. The savvy broadcaster will fine-tune programming to integrate elements that are beyond that what the various digital music players can provide."



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

CAPTIONED RADIO TO TAKE ANOTHER STEP

"Captioned radio" is about to take another step forward.

Methods by which radio stations can transmit data that displays as text on future analog FM as well as digital radios are nearing approval as a recommendation by the International Telecommunication Union, according to NPR Labs.

As we've reported, NPR Labs has demoed captioned radio on a prototype Delphi dual-display dashboard.

The ITU is a United Nations agency that adopts standards recommendations for telecommunications services worldwide. NPR Labs has been quietly working away on this project, funded by a grant from the National Institute on Disability and Rehabilitation Research; it's great to see continued progress. An ITU recommendation would provide receiver manufacturers with a roadmap to take the captioned radio concept beyond U.S. borders.

On its website at (www.nprlabs.org), NPR Labs urges anyone — but presumably receiver and chip makers, stations and people with hearing loss, in particular — to contact regulators of radio spectrum in their countries and urge support of the captioned radio recommendation that's out for ballot by members of the United Nations.

NEWSROUNDUP

LPFM: President Obama signed the Local Community Radio Act. Danielle Chynoweth, director of strategic planning at the Prometheus Radio Project, called the law "an opportunity for radio professionals and enthusiasts to help revitalize the radio dial." FCC Commissioner Michael J. Copps said, "I have been waiting for this day for a long, long time." Chairman Julius Genachowski, like Copps a Democrat, promised, "The FCC will take swift action to open the dial to new low-power radio stations and the valuable local service they provide."

JONES: Kris Jones left NAB after six years to take a position with the Washington office of News Corp. as director of government relations. Most recently he was vice president of media relations at NAB.

CES: JVC, Kenwood and Clarion expanded their HD Radio offerings, with JVC introducing four in-dash CD receiver models with HD Radio. HD Radio is among the offerings on the new Toyota Entune multimedia system, as are Pandora and Clear Channel's iheartradio. Pioneer showed nine automotive in-dash products with Pandora streaming and control through a connected Apple iPhone. More details in our pending CES wrapup issue.

SPOTS: Insurance providers ran the most spots in U.S. radio last year, followed by fast food companies and

The text recommends that receiver manufacturers "employing any or all of the ITU DSB System A, ITU DSB system F, ITU DSB system C and/or traditional analog FM be strongly encouraged to produce receivers that display captioning in a way consistent with ITU-R recommendations" and "that broadcasters be strongly encouraged to transmit programs with captioning as an integral part of their broadcast."

Though not a formal standard, the language outlines how the captioned radio data could be transmitted with either an FM RDS subcarrier or with the data capabilities of several digital radio systems including DAB, Digital Radio Mondiale and HD Radio.

Balloting for this item closes Feb. 6.

In summer 2010, the NPR Labs team showed government officials and representatives from groups representing disability communities its prototype car dashboard featuring a captioned-radio display in demos at both the White House and the Commerce Department.

NPR Labs conducted the first live captioned radio broadcast on election night 2008, when NPR's election coverage was simulcast in captioned-radio format. It worked with the International Center for Accessible Radio Technology at Maryland's Towson University, Boston's WGBH Media Access Group and Harris Broadcast to provide captioning coverage for five local Public Radio Satellite System stations.

There were several demos that night; I attended the one at Towson University and I met several people with hearing loss who were excited about such a service.

home centers/hardware stores, according to measurements by Media Monitors. Insurers ran 4.4 million spots in 2010. Categories that moved up the rankings were government/unions/associations; cosmetics/skin car; cars/trucks; and telecom bundled services.

TIS: The FCC is thinking about expanding the role of Traveler's Information Stations and has opened a Notice of Proposed Rulemaking. Those AM services provide motorists information on traffic congestion, accidents and weather reports. The Highway Information Systems Inc., the American Association of State Highway and Transportation Officials and the American Association of Information Radio Operators asked the FCC to allow regional broadcasts of more types of potential life-saving emergency information to travelers.

EEO: In an equal employment opportunity case, Oregon's Opus Broadcasting was hit with a \$20,000 notice of apparent liability for forfeiture. Opus is licensee of KROG(FM) in Grant's Pass; KCNA(FM) in Cave Junction; and KRTA(AM) and KEZX(AM), both in Medford. The FCC said Opus failed properly to recruit for 28 of 29 full-time vacancies over a six-year time period; failed to provide records of the number or referral sources of interviewees; and other problems.

CONFERENCE: International religious broadcasters TWR International and HCJB Global plan a conference to examine funding issues. The conference is March 9-10, in Cary, N.C.

GEN 6 NANO KEEPS FM LIVE PAUSE

Radio engineer Alan Jurison was kind enough to share his thoughts on the radio features of the new sixth-generation Apple iPod nano. That's the one iPod device that has built-in FM radio. The 8 GB unit is \$149 and the 16 GB unit lists for \$179.

Jurison, who has been writing about RDS in a series for Radio World, finds the FM analog and RDS sensitivity of the newest Nano similar to those of the fifth generation. "They kept the RT+ and Proprietary iTunes Tagging very similar to the fifth generation, but actually made them slightly more intuitive because you touch a 'tag' icon," he tells me.



It does not support the RT+Album Field; he says that in the sixth-gen unit, there isn't enough real estate on the screen to fit it anyway. The fifth generation does have room to store it. "It's a shame they didn't make the display slightly larger and support album data tagging via RDS."

Apple kept the "live pause" of 15 minutes of FM radio; and there's a neat local radio station list that auto-populates with all local stations detected, he tells me. Radio regions are still supported, so it will support different FM standards and bands across the world.

However, a big negative for Alan is it's hard to turn off the device. "You can drain the battery listening to radio and pressing what you think the power button is. You need to stop playing the radio by pausing the station, or by stopping the song you are playing." Frustrated users have been venting about this on Internet sites.

Apple's official documentation at support.apple.com, titled "About Sleep/Wake on Your iPod Nano," states that you have to press the Sleep/Wake button, and it will turn off in 36 hours if there is no activity.

Apple has removed the external buttons for next/previous track (or station); the tech developer relies on their earbuds with an integrated button that has a fourth pin on the 1/8-inch jack for this functionality, according to Jurison (who likes to use more professional headphones).

For this reason, plus the small screen, which is about an inch and a half square, as well as the way the unit turns off, he prefers the fifth-gen nano.

I like how Apple describes how to use the FM radio feature at support.apple.com/kb/HT4316.

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It's a Transmitter, Not a Habitrail

Send in Your Caption Ideas for This Furry Friendly Fellow

John George and Fayne Anderson handle equipment sales and do contract and project work out of Columbia, S.C. Recently they made a trip to a small-market AM station to repair a transmitter that was DOA. They found the culprit, seen in Fig. 1.

WORKBENCH

by John Bisset

Read more Workbench articles online at radioworld.com

Even in warmer climates such as we might find in South Carolina, mice and insects love a warm transmitter during winter months. Seal your transmitter building; it's less costly than being off the air because of a failed power supply.

Thanks, guys, for the winterizing reminders and the great photo. (Is that a vole?) John George of Broadtech Services can be reached at broadtech.mail@gmail.com.

So, let's have a caption for this shot! E-mail your suggestions to johnpbisset@gmail.com. And remember to use the camera on your smart phone to document any damage for your client — or to submit to *Workbench*.

With so many USB audio interfaces having embedded themselves in Chuck Bullett's

Cumulus San Francisco operations, he's wound up with a pile of old Henry analog -10 dB unbalanced to +4 dB balanced bidirectional Matchbox audio converters on his "to be forgotten" shelf.

Gone are the cassette decks, cheap computer audio cards and other consumer audio devices in his plant. And now that USB interfaces are so popular, combined with flash drive and audio capture devices, the old-style Matchbox has been all but displaced by Henry's popular USB interfaces.

The first-gen Matchboxes found a new home, however, at Chuck's transmitter sites. He's using them ahead of Arbitron's PPM QoS monitor decoders as a gain stage. The analog PPM decoders require a consistent +4 dB to saturate the audio inputs. Chuck's Inovonics off-air QoS receivers, though balanced at their output connectors, provide -10 dB. Chuck wires the high (+) lead for each channel to the tip of the RCA connector going to the Matchbox's input, and connects the low/ground (-) and shield to the ring of the RCA input on the Matchbox. The Matchbox provides sufficient gain to saturate the PPM monitor's inputs for healthy watermark sampling.

If the PPM decoders do not see enough audio to sample, they'll alarm and cry out for help. One thing that makes Chuck's heart stop these days is seeing



Fig. 1: A warm transmitter is a real temptation. Send us suggested captions for this photo and we'll publish the best ones.

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Logitek

WORKBENCH

(continued from page 10)

the red alarm light flashing on those QoS monitors; in his view that situation requires an immediate response. Chances are you're still encoding; but without substantial audio driving the input on the QoS monitor, one can't be sure. In the markets that are using Arbitron's PPM for currency, when the red light goes out you might as well be off the air, at least as far as ratings go.

The key for controlling Chuck's blood pressure is in feeding the PPM monitor a robust audio signal. Repurposing the Matchbox has solved the problem.

Chuck Bullett can be reached at chuckbullett@gmail.com.

It should go without saying that attention to your EAS tests is a paramount engineering duty.

Fig. 2 shows a funny time stamp on a Sage EAS unit. The contributor, who wishes to remain anonymous, writes that the date stamp year probably explains why the RMT did not go through.

Standard duct tape can take a back seat now that Gorilla Tape has arrived.

Typical duct tape adheres best to smooth surfaces. Gorilla Tape, with its additional adhesive, will stick to uneven surfaces. This makes it ideal for remote kits. I'll grant that this brand of waterproof tape is more difficult to pull off the roll because it has more adhesive

Add a 'space blanket' to your transmitter site emergency kit.

than duct tape; but it tears sideways with minimal effort.

Its "Tough and Wide" roll, 3 inches across, will secure microphone, speaker or AC cables to concrete, brick or tile. Reduce your liability at a remote by securing cables across thresholds or in

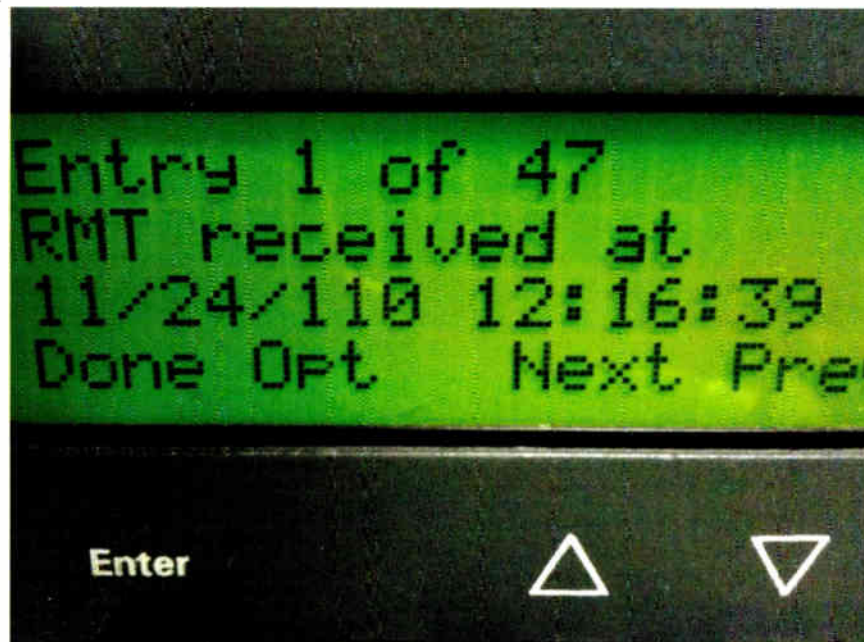
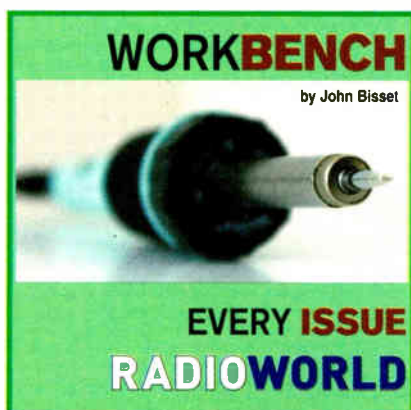


Fig. 2: Be sure to check the date function on your EAS equipment.

a parking lot.

I recently needed to cap an open conduit and didn't have a PVC or other cap handy, so I tried the tape. Having never used the tape, I plugged the conduit first with a wire wrapped around some paper towels. My thinking was if the tape cap leaked, the towels would absorb the moisture. If the tape really leaked and saturated the paper towel, the wire would help me remove it in one piece, without the paper tearing and fouling the conduit.

I needn't have worried. When it came

time to remove the tape, everything was dry, despite a couple weeks' worth of heavy wind and rain in the meantime. The tape removed easily and there was none of the residue you would expect with duct tape. Impressive.

For the fun of it I took a small piece of the paper towel and rolled it into a ball, covering it with a couple of pieces of Gorilla Tape fastened to a painted plank; then I left the plank exposed to the sun. After two weeks, the tape pulled up easily, again with no residue. The paper towel was dry.

The Gorilla Tape backing is resistant to UV and water. With these features, the 1-inch size might take the place of black wire ties used to secure outside cables. Send me pictures if you try the tape and find it successful for this application.

The Gorilla guys also offer Gorilla Epoxy. Advertised as setting within 5

there's nothing worse — or more dangerous — than trudging through the snow to get to a site, only to spend the rest of the day, and possibly the night, in cold, wet clothes.

In his years of working on remote mountaintop sites, Tom always carried one or two "space blankets" — aluminized Mylar, as at www.mcrmedical.com — and a large zip-type bag containing a spare, dry stocking cap; gloves or mittens; and a pair of socks.

Use a gallon-size bag and squeeze out the air before sealing; it won't take up very much room in the winter "crash bag."

Nowadays, a handheld GPS is handy, too. Heavy fog or blowing snow can make it easy to become disoriented.

Great tips, Tom, to keep us safe. I haven't priced those space blankets in years. You'll find them at the site listed for only a few dollars, well within the reach of every budget. Tom Franklin



Fig. 3: Gorilla Tape, with its additional adhesive, is ideal for remote kits.

minutes, its bond is stronger and will work on steel, aluminum, wood and ceramic. An easy-to-mix syringe applies the appropriate amounts to your project; a tight-fitting cap means the syringe can be reused.

Gorilla products can be found at True Value and Lowes stores. For fun YouTube videos and more information on the company's products, click on www.gorillatough.com.

Tom Franklin works for Northwest Communications Systems, headquartered in Oregon. He writes that

can be reached at tom@norcomsys.com.

Remember to send in your captions for Fig. 1, to johnpbisset@gmail.com.

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

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

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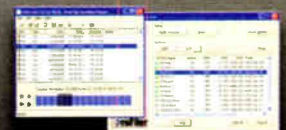
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There I Was at the Greek Festival ...

Recollections From More Than Thirty Years of Radio Remotes

BY DAVE HALLOW

Radio World asked for remote stories in its Sept. 8 article "There I Was, at the County Fair." Here are some I managed to accumulate during more than 30 years in radio. The names are fictitious.

FIRSTPERSON

During the mid-'70s I was employed by a "he who pays, plays" brokered ethnic station in the Chicago market. One of the best parts of the job was when the Greek Orthodox churches held their spring festivals, from which we ran remotes.

One of my favorites was from a church located only a few hundred feet from the transmitter site of a 50 kW AM. One year, upon setting up and checking the line with the station, it seemed the nearby powerhouse was just banging through. My location was under a tent in the middle of the parking lot; grasping for straws, I connected the earth ground from my Shure M67 to one of the copper tent pegs (how's *that* for luck?). Wonder of wonders, the interference was gone; the show could go on.

As soon as I got the signal from the station, I cued the talent, who proceeded with his usual opening of "Hello, maaaaan!" Hot puppies! We were on the air.

However, no sooner had I begun to relax than some kid came up and yanked the ground wire. Suddenly Bobby Papadakis was replaced by "I Love the Blues and the Boogie Woogie." We now were simulcasting another station's programming.

Fortunately, the engineer at our studio was on the ball and immediately wowed into a bouzouki instrumental.

Choking back the desire to throttle the kid (it probably would have made for bad PR), I darned near killed myself jumping over our table, hoping I'd land somewhere near the tent peg. Fortune and gravity were with me; I landed on target, where I reconnected the ground and continued with the broadcast.

'G ... 47 ...'

Same place, different year, I was in the process of setting up under the tent when a strong horizontal wind lifted one end of the tent, which proceeded

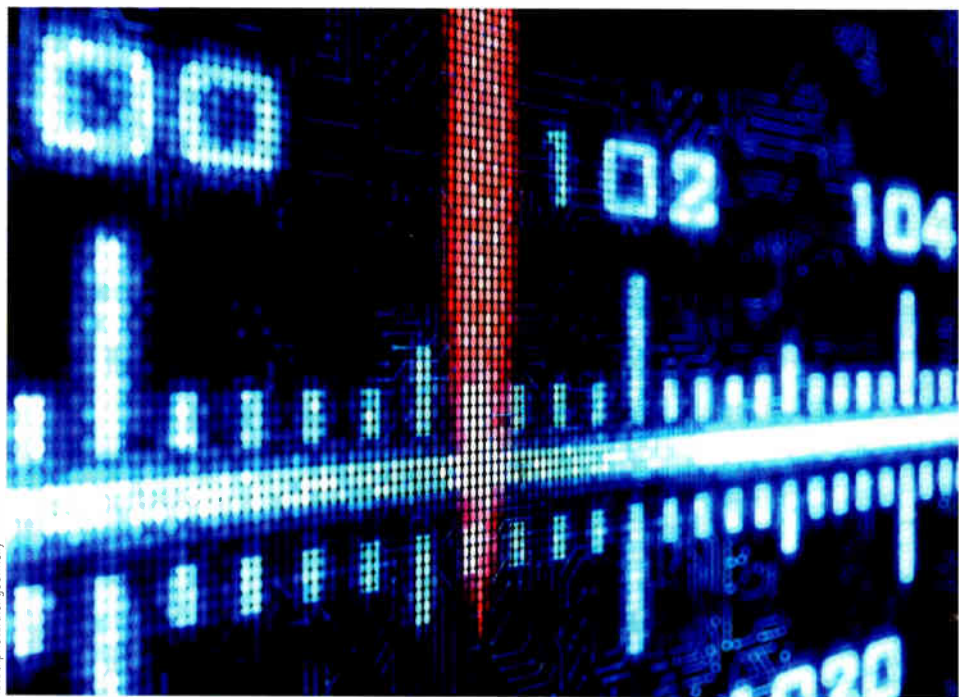
I connected the ground from my Shure M67 to one of the copper tent pegs.

to fold up. I was able to dig our gear out from under the fallen tent, but there was no way it could be raised again before air time.

I wasn't going to let such a small thing ruin the program, though, so I gathered up gear and talent and headed down into the church's kitchen, where I commandeered the phone. I unscrewed the handset's transmitter cover, did a

quick clip-clip across the contacts and the show went on as scheduled — with a Bingo game going on in Greek in the background.

Around the same time I moonlighted (with my employer's blessing) for a short time at a small 5 kW in the



burbs that just loved covering local high school sports, a task made easier with a vintage Marti RPU 40. This worked well, particularly when the remote announcer hung his hat on a hat rack instead just dumping it on the little UHF portable loop antenna.

As I'm sure anyone who's had to

coordinate local band usage knows, feelings can be bruised when a guy wants to use "his" frequency for program pickup at the exact time another is using "his" frequency to order his crew dinner. This is a perfectly good use of the frequencies, coming under the "operational communications" clause in everyone's tickets.

I've always believed in the fly-catching abilities of honey compared with the same qualities of vinegar. I waited as

long as I dared, then I placed the call, which went something like this:

"NBC, NBC, this is WGSB in Geneva, and we require this frequency for program pick-up. Will you kindly relinquish the frequency, sir?"

To which I got this immediate answer:

"Certainly, sir. Glad to do it. NBC out."

Wouldn't it be wonderful if all ops were as nice as the guy from NBC?

HOT AIR TALENT

My next move was to Las Vegas, where every weekend in the mid-1980s we ran a remote from the sports book in one of the major Strip casinos. It was a simple show, using one combo headset/mic for each of the talent plus one for me, all plugged into an M67. The cans with mic were all Telex; and like nearly everyone else, we used big colorful Nerf foam balls for blast filters.

This approach worked well, too, at least until our odds wizard put on his phones, then decided he wanted to relight his stubby, well-chewed cigar butt, which couldn't have been more than one inch long.

I guess his eyes couldn't quite cross tightly enough to allow him to see what he was doing. When his turn to

(continued on page 16)

MARKETPLACE

HARRIS PROMOTES 'HITLESS DYNAMIC DELAY CONTROL'

Harris says its Intraplex SynchroCast3 simulcast system handles dynamic delay control "hitlessly" in STL transport connections.

When a change in absolute delay on the STL occurs, SynchroCast gradually adjusts the added delay until the desired total is restored while ensuring that the audio playing through remains uninterrupted.

"This degree of control in synchronous broadcasting technology is the result of more than 20 years of simulcasting experience in FM broadcasting, mobile radio and public safety communications," it stated.

SynchroCast3 modules work with Intraplex T1/E1/IP multiplexers and GPS digital timing. This enables a network of transmitters to work together to increase coverage areas and reduce interference, according to Harris.

The system also provides simple control of system functions critical to adjusting the coverage area, along with reference signals to the transmitter station for precise control of channel frequencies.

Hitless dynamic delay control was discussed in a white paper by Bob Band of Harris for Radio World Engineering Extra; see www.radioworld.com/article/110650.

Info: www.broadcast.harris.com



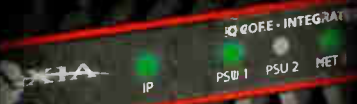


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iQ. It's about time.



axiaaudio.com



REMOTES

(continued from page 14)

give me a level came, his time almost came as well. Instead of lighting his little cigar butt, he had set fire to the Nerf ball. I don't mean he just singed it a bit. Nope! Ol' Jack had a five-inch flame going.

In the early 1990s in northern Illinois, I worked for a station that used remotes to promote itself and its DJs. One fine Saturday, our morning man was slated to do a remote from a local shopping center. It should have been a no-brainer; the hookup was via Marti and the talent only needed to do live cut-ins.

I think he'd done maybe two when I received a phone call at home from the jock about static on the remote signal. I asked if he was using the Marti RPT 30; he said yes. I asked if he was on Channel 1. Yup, he was. Was he using the yagi antenna? Was it pointed toward the station? Yup again.

The shopping center was a mile from my house, so I managed to get there before the next break. The remote was taking place from inside the mall using an RPT 2, linked to the van and then back to the station.

I found the station van but saw no yagi. I thought he must have switched over to the roof-mounted whip. But

when I looked through the van window, I could see the coax switch, with the yagi selected. Curious.

I found our DJ in the mall and asked him to pry himself away from his adoring fans and step out to the van. There, I asked him where the yagi was. He said, "There it is," and sure enough, there it was; what's more, it was pointing in roughly the direction of the station. Only problem: "There" was on the mount used for storing the antenna inside the van.

I thought this was a teachable moment, so I put my arm over his shoulder and said, "Jack, the whole idea is to put the antenna on the pneumatic mast up in the air outside the van."

He knitted his brows in intense concentration; then, with a sudden sense of realization and his eyes wide open, he said "Oh!" as if he'd just worked out all the questions of the universe.

ONE MORE

By the end of the 1990s it had occurred to me that I was simply getting too damn old to run around on all these remotes. I found myself working very happily as an RPU tech with Marti Electronics.

A Seattle station decided they were going to do their remote from an operating streetcar. Evidently they had 110 VAC available, and they were planning

on using an RPT 30 into a 5/8-wave-length whip.

The streetcar itself ran on roughly 9 squillion volts, picked up through the pantograph from an overhead cable. Realizing this, the folks at the station made copious measurements and doubtless checked with the company that

Instead of lighting his little cigar butt, he had set fire to the Nerf ball.

owned and operated the trolley car and made every other such check they could think of to be absolutely certain that there would at all times be sufficient clearance between the overhead power lines and the tip of their antenna.

Well, they got *almost* all the information. In standard running, the antenna's tip was safely removed from the overhead lines, and that part of the remote worked just dandy. But their best-laid plans were about to go "aft agley" because no one had taken into

consideration what would happen when the streetcar entered a tunnel.

I don't have the exact dimensions; suffice to say the antenna made contact and all 9 squillion volts hurried down the coax. It was most unfortunate. For a while there they were having a nice little remote.

When the transmitter arrived at Marti in Cleburne, Texas, I thought I might as well start looking at the output filter box, where the jolt had hit. Every coil in the box had been vaporized, leaving the inside of the box coated with the thickest layer of black gunk I'd ever seen.

Well, I like a challenge, so I had a ball with this one. Actually, as I recall, that was just about the only problem, because once the output filter box had been turned into a small, empty bat cave, the charge had flowed harmlessly over the chassis and exited through the ground pin on the AC plug — although the guy I talked to did admit to feeling a little tingle through his hand mike.

It wasn't long after moving with Marti to Quincy, Ill., that I came down with a case of Parkinson's Disease. That pretty much put an end to my radio engineering career; but as they say, they can take the guy out of radio, but they can't take radio out of the guy.

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

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CONLON

(continued from page 4)

part of that is being a good listener.

We're pleased that our lead customer for HD PowerBoost and asymmetrical sidebands, the formidable WAMU in Washington, has received no interference complaints whatsoever. FCC staff has seen this technology, and we believe that broadcasters will have no impediments to using this technology in the future.

The best thing we've learned about asymmetrical sidebands is how useful it is. Giving broadcasters the flexibility to precisely manage increased HD injection rates will open a lot of doors that might have permanently remained closed. The fact that we bundle it with HD PowerBoost means they can do a lot more with their existing transmitters, avoiding the need to possibly replace a system they recently purchased, or buy a second system.

McLane: You recently won a 30-site contract for 180 transmitters to the Kingdom of Saudi Arabia. What are some of your other most notable projects?

Conlon: In the past 36 months, we've been honored to deliver 160 AM and FM transmitters totaling 1.8 Megawatts to the government broadcaster in Turkey. We've also installed some very exciting high-power MW projects in Taiwan, Argentina and Pakistan, to name but a few. Our employees take great pride in every project we do, but are most proud that the first transmitters we shipped, over 40 years ago, are still in use, and supported by our customer service department.

McLane: One in your series of webinars is about "Push Radio." What is that?

Conlon: We were debating the desirable characteristics of our new VS lower-power FM transmitters. One direction we were following was how to extend the redundancy we build into our sub-systems out to the audio source so that, if one source fails, the system would automatically look for an alternate content source and keep the station on the air. We decided to have a "last refuge" source of content on a USB drive.

Well, in order for the USB drive to work, we had to build in an FTP server. One day, Chuck Kelly said, "Wait! If we have an Internet connection and an FTP server, we can deliver new content and playlists whenever we want to the USB drive without ever having to visit the station." Push Radio was born.

The Internet isn't a very reliable medium for real-time distribution of audio, but *is* reliable for distribution of files. So Push Radio means stations can eliminate the satellite link, and signifi-

cantly reduce costs, all while improving reliability and maintaining localism.

The VS can operate as a completely standalone system, monitored remotely with content delivered right to the transmitter and the audio can be processed by the Orban Inside. The VS becomes as simple to install as a home computer: Unpack it, plug it into power, the antenna and the Internet, turn it on and you're on the air.

Of course, I'm simplifying it a bit, but it is the direction we are moving towards.

Push Radio is particularly valuable

for networks that use expensive satellite networks to distribute their programming in real time to a large number of transmitters over a wide geographic area. Our VS transmitters have the ability to play audio directly from a USB memory stick, and users can even upload new content and playlists via the Internet connection.

McLane: Other areas of emphasis as we head into NAB season?

Conlon: Yes, I think it's worth commenting on the unique nature of Nautel's corporate structure that is especially rel-

evant to customers in these trying times.

Broadcasters, for good reason, are being very careful about how and with whom they spend their limited capital budgets. They're looking for value but also for vendors who they can rely on for support and who they can count on in the future. As a privately owned company with a long-term view of the market, we make investments in engineering and support when our customers need it, not when the markets tell us we can. We depend on our broadcast customers and we know that they depend on our transmitters.

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All STL Paths Are Not Created Equal

BY PAUL THURST

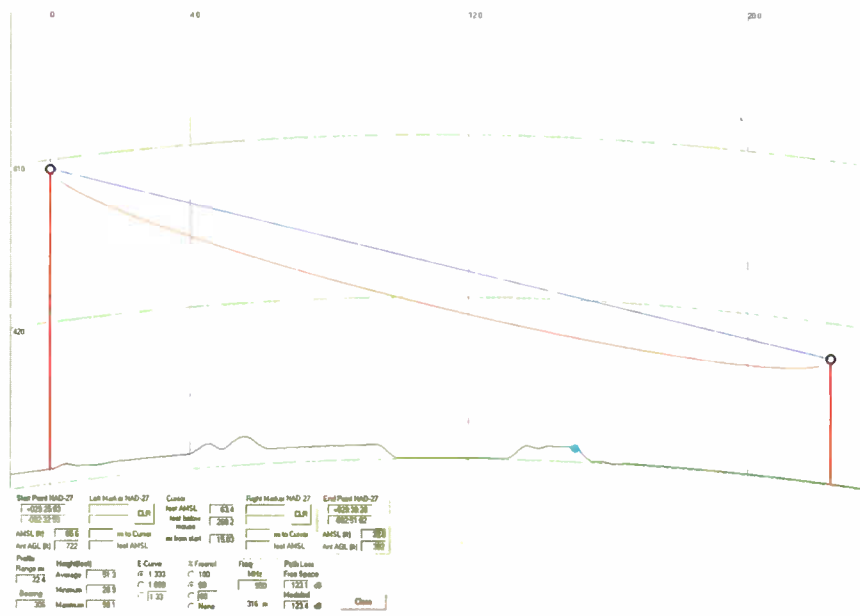
I learned this one the hard way: All climates and terrain are not equal ... an important detail when planning a studio-transmitter link.

TECHTIPS

The RF STL is usually in the 950 MHz band, although lately people have been using 2.4 and 5.8 GHz unlicensed systems with good results. What works well in the Northeast, for example, might not work that great in Florida, where tropospheric ducting and multipath can create reception problems.

One example of this happened in Gainesville, Fla. A station there had a 15-mile path over flat ground with tall towers on either end. It had full line of sight and Fresnel zone clearance. Ordinarily the signal strength was -65 dB, which is about 25-30 dB of head room for the equipment being used. However, in the mornings, most often in the late summer/early autumn, there would be brief dropouts of a few seconds.

After two years of suffering through the mysterious morning dropouts, we



950 MHz STL Path Study

finally rented a plane and flew the STL path, only to discover a swamp right in the middle that was not on the topographical map.

On mornings when dropouts occurred, we surmised, dense fog would rise up,

causing the RF path to bend and creating multipath at the receive antenna. It was a Moseley Starlink, and the digital demodulator would unlock due to high BER. The signal strength never moved off of -65 dB.

Of course, had this been an analog STL, it would not have dropped out, although it may have gotten a little noisy for a few minutes.

I have learned to be very conservative with my STL path analysis, using software tools like rfProfiler from rfSoftware to look at the theoretical path but also surveying ground obstacles like trees and building, which are not accounted for in the USGS terrain database. There are several RF software programs out there that will do the same thing.

Recently, when a station manager insisted that an STL path was possible from a proposed new studio location, I deferred to the path study, which showed only about 50 percent Fresnel zone clearance. True, the path is less than a mile, and one can see the top of the transmitting tower from the roof; but trees, buildings and even an access road create problems that could potentially cause STL dropouts.

We are not going down that road again. The station manager, whose background is in sales, was told to find another location or order a telco T-1.

Reach Paul Thurst at paul.thurst@gmail.com. This item originally appeared on the author's blog *Engineering Radio*. Send us your own tech tips, or comment on this or any story, at radioworld@nbmedia.com.

WHO'S BUYING WHAT

Interlochen Public Radio installed a **Dielectric DCR-H4 FM antenna**, shown, for its **WLMN(FM)** at 89.7 MHz in Manistee, Mich.

SPX Communication Technology (formerly Dielectric) said this is the second DCR-H4 antenna purchased by IPR. The station went on the air in August and serves an area of approximately 40,000 people. Jack Connors is IPR chief engineer. ...

Axia said **WBGL(FM)** in Champaign, Ill., ordered three **Element 2.0** consoles and associated gear. The station is owned by Family Friendly Radio. "The purchase expands WBGL's Axia installation to four studios; the sale was made by **Broadcasters General Store**," the manufacturer stated. WBGL put its first Axia studio on five years ago. ...

Barix AG said syndicated content provider **Bell Media Group** of Raleigh, N.C., used the **Barix Reflector Service** to distribute live **North Carolina Central University** football and basketball games to eight regional AM radio stations comprising the **NCCU Sports Network**. Barix introduced the Reflector Service last year "to help broadcasters with limited IT resources to establish IP links for single stations and broadcast networks with minimal effort and hassle." Jay Bell is president and chief engineer for Bell Media Group. ...

Joy FM is using an **RBRX1** from **BW Broadcast**. The organization serves Guam and the Northern Marianas. Matthew Dodd is general manager. The manufacturer said Joy FM was among the first users of its RBRX1 rebroadcast receiver, which won a Radio World "Cool Stuff" Award this spring.



MARKETPLACE

EVANS LEAVES EVANS TO START EVANS

B. Benjamin Evans is leaving his family's Wisconsin-based professional engineering firm, **Evans Associates**, to start his own shop, **Evans Engineering Solutions**.

"After 30 rewarding years at Evans Associates, I felt the time had come for me to go in a slightly new direction and expand into other areas of engineering," he told *Radio World*.

"That's why I've started my own company, **Evans Engineering Solutions**. But as long as there is a continuing need for my broadcast engineering consulting services, I won't give that up, because that's how Evans Associates started."

Evans Associates was started in 1968 by his father **Ralph E. Evans Sr.**, his mother **Rosa Evans** and his brother **Ralph E. Evans III**. Their parents died in 2005 and 2009, respectively; Ben was an ownership partner with **Ralph III**, who now continues as sole owner of Evans Associates.

The company was founded on engineering services for the radio and TV broadcast industry, including FCC applications for new and modified stations, expanded coverage studies, transmitting facility design and construction supervision, and field testing. Later it expanded to design and implementation of video/voice/data networks, public safety radio network planning and engineering and wind turbine siting.

Ben worked there as a staff engineer during college, then joined the company full-time in 1980 after earning a degree in electrical engineering.

Ralph now will continue to handle certain telecommunications clients and public safety radio engineering, Ben said. "I will continue to work for broadcast clients for such services as FCC applications, engineering studies (for upgrading, relocating a transmitter, etc.), microwave design and planning, and some field work."

The new firm will also be involved in wind energy technology, a developing area of interest. Evans explained: "I assist wind energy developers with the siting of turbines, making sure that the turbines don't block radio pathways, particularly microwave links, and don't disrupt other forms of communication such as public safety radio and broadcast radio and TV reception. I plan to expand into other areas of renewable energy."



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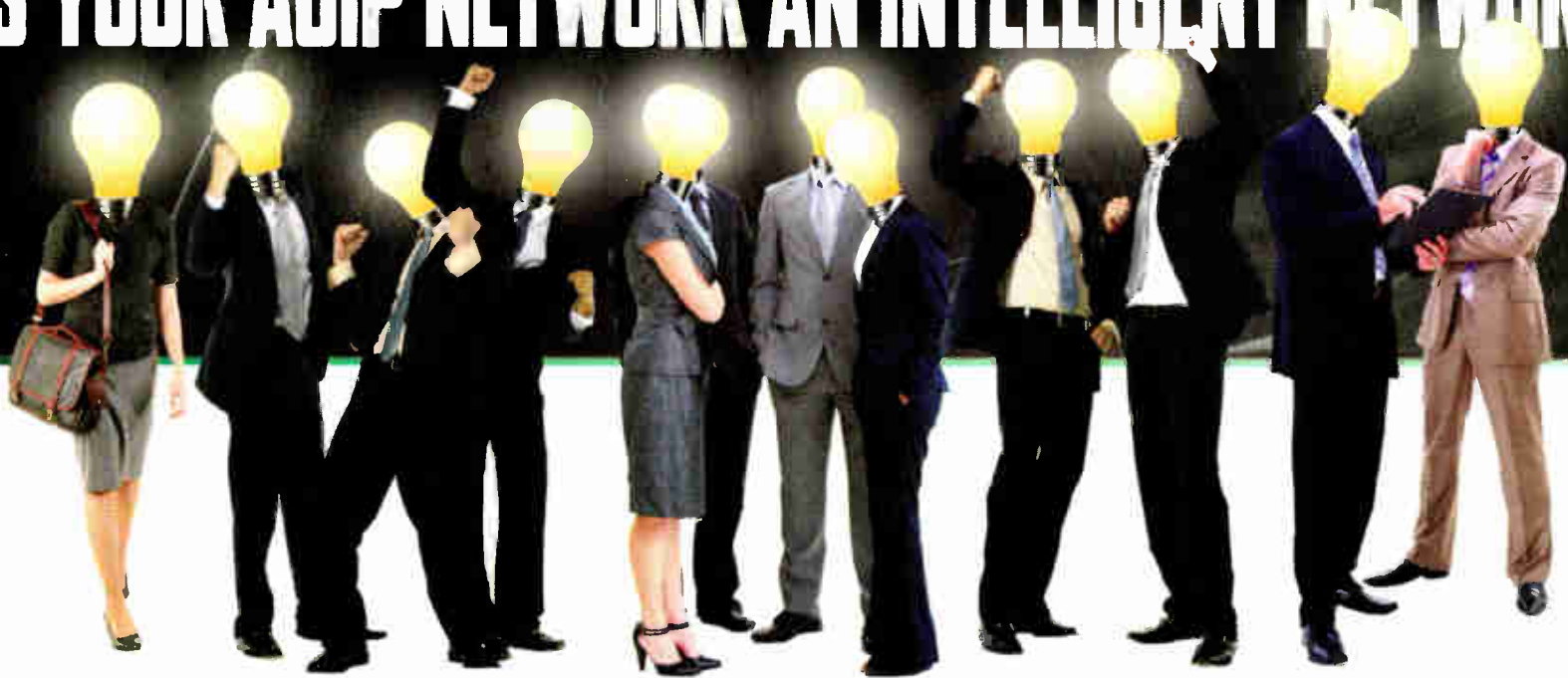


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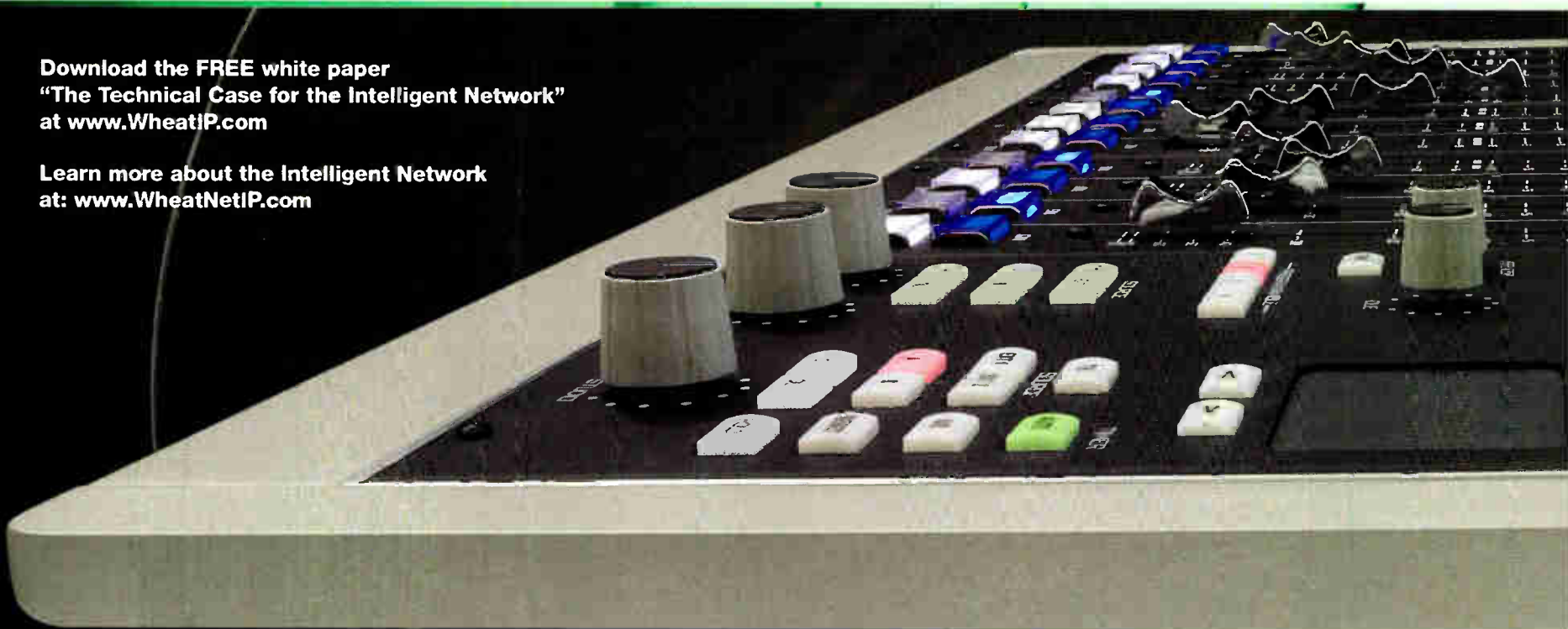
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It's true. When you add up all the costs for your network, WheatNet-IP comes out to just about the same money as the other guys. No marketing mumbo jumbo about your labor or performance here - we're talking straight hardware comparisons. Go ahead, configure your network and see. Of course we DO out-perform them by up to a factor of ten. And we DO save you great googobs of money by giving you a system that configures, runs and heals itself... Still, do a full-network hardware comparison and check it out for yourself! Operators are standing by...



How Transmitter Power Supplies Evolved

How You Gonna Put 'Em on the Air When There's No DC?

BY JAMES E. O'NEAL

Ever since a young Henrich Hertz began constructing the scores of electrochemical cells needed to power the

ROOTS OF RADIO

world's first radio transmitter in the 1880s, designers have sought out better and more efficient ways of providing the required voltage sources for transmitters.

Today, it's not that big a deal; you just hang some diodes on the output of a power transformer, add some electrolytic caps and maybe a choke or two if you want to be fancy, add a pre-packaged regulator, and you're in business. Actually, the power supply of a modern radio transmitter is probably one of the most reliable parts of the whole machine. Nobody gives them much thought at all anymore.

But it wasn't always that easy.

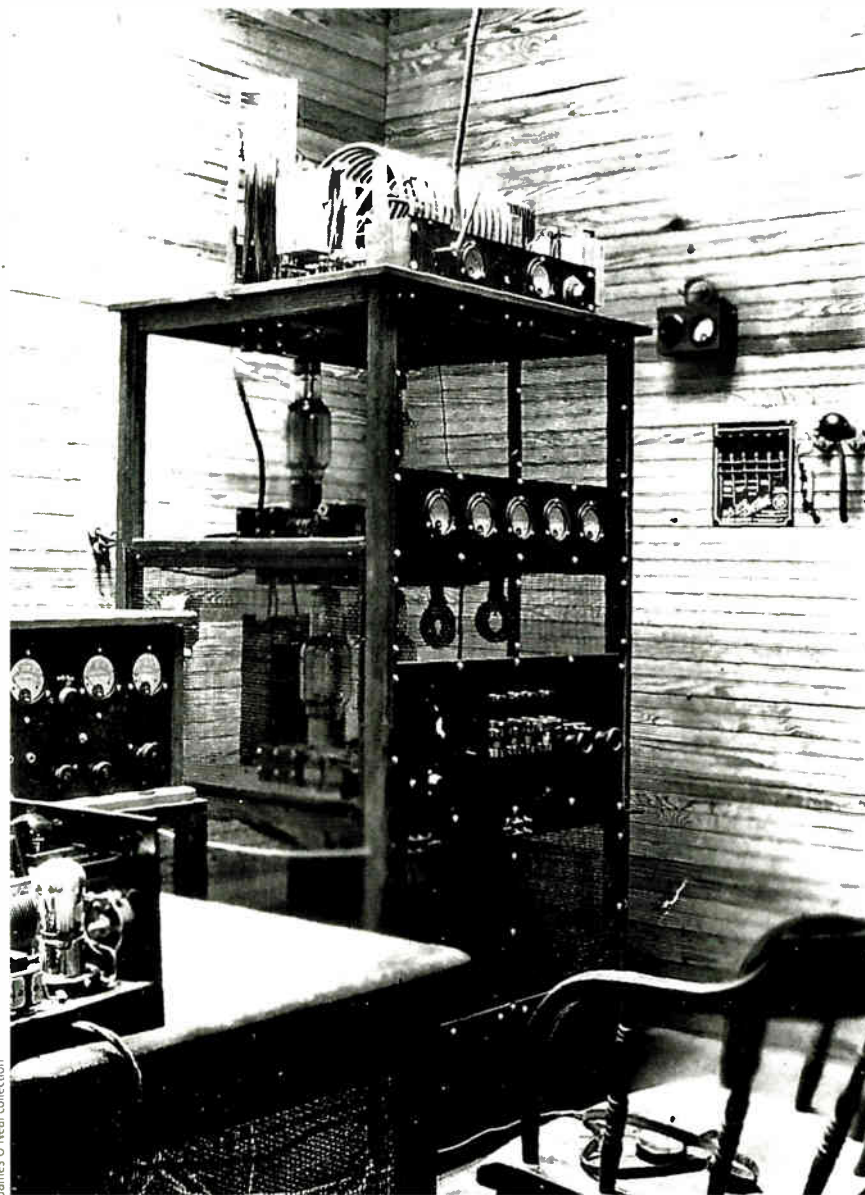
The history of the lowly transmitter power supply — from its humble (and sometimes complicated) beginnings to the compact, quiet, cool-running and efficient package of today — is full of interesting twists and turns. In this two-part article, we take a look.

The history of the lowly transmitter power supply is full of interesting twists and turns.

Hertz's primitive battery was sufficient to power the spark oscillator he constructed to prove out Maxwell's equations, and this set the scene for everything that was to come.

Following on the footsteps of Hertz, Guglielmo Marconi began experimenting with "low-power" transmitters, and finally reckoned it was time to scale things up and perhaps put wireless technology on a paying basis. He was responsible for the first really "big" transmitter, which was completed in 1901 in his attempt to span the Atlantic by radio. And like many future engineers, Marconi ran into some power supply problems.

Ambrose Fleming had been hired as



Loy Barton's initial 500 watt KUOA 1924 transmitter design used a mixture of power sources: a motor-generator set for plate voltage, a battery for bias and a conventional AC step-down transformer to light tube filaments. However, hum problems forced him to replace the transformer with another motor-generator set to supply DC to the filaments.

a consultant to help with the design and construction of the large transmitter, and came up with a "double-decker" spark oscillator powered by an AC generator. As with most new technology, things didn't work that well right out of the box.

Fleming's notes indicate that some amount of time was spent in experimenting with circuit configurations to try to optimize performance. He went for a true "smoke test" on at least one occasion, noting that "large resonance effects" were suffered by the alternator, with its windings smoking from the RF being fed back into it.

Fast-forward a few years to Marconi's commercial radio service between Cape

Breton, Nova Scotia, Canada and Glace Bay, Ireland. A hybrid DC generator/storage battery configuration replaced the earlier alternator as a power source. This consisted of three series-connected 5,000 volt generators tied to a storage battery made up of 6,000 two-volt cells, each rated at 40 amp/hrs. The fully charged batteries alone could power the spark transmitter for quite some time, as the total capacity was approximately 500 kWh at 12,000 volts of very pure DC.

However, that was "spark," and as such didn't have much entertainment value for the general public. AM transmitter technology began to evolve for transmitting speech and music, and

with it came additional requirements for direct current power.

AM RADIO

The Poulsen arc or "arc-phone" transmitter was the earliest device that could be used to modulate a carrier with speech and music in a practical manner. Charles Herrold in 1909 used arc technology to become the first broadcaster on the West Coast. According to Mike Adams and Gordon B. Greb in their book "Charles Herrold, Inventor of Radio Broadcasting," Herrold met the high-current DC demands of his transmitter, and keep operating costs down, by "borrowing" power from a 500 volt streetcar catenary that was conveniently located near his station.

When the broadcasting craze broke in the early 1920s, many individuals were vying to get a station on the air, and as "old-line" radio transmitter companies didn't exist, this led to some unusual designs (and sometimes very steep learning curves).

One of the biggest problems was in powering those first-generation broadcast rigs. Notwithstanding the DC plate potential required for the RF power tubes, high-current DC was also required for filament power, as virtually all tubes then were designed with DC filaments.

Providing pure hum-free DC was a real challenge.

As a work-around, at least one early station ran its transmitter strictly on storage battery power: KJBS in San Francisco. The station even made on-air announcements plugging the Willard Storage Battery Company, according to an account by John Schneider on the bayarearadio.org website.

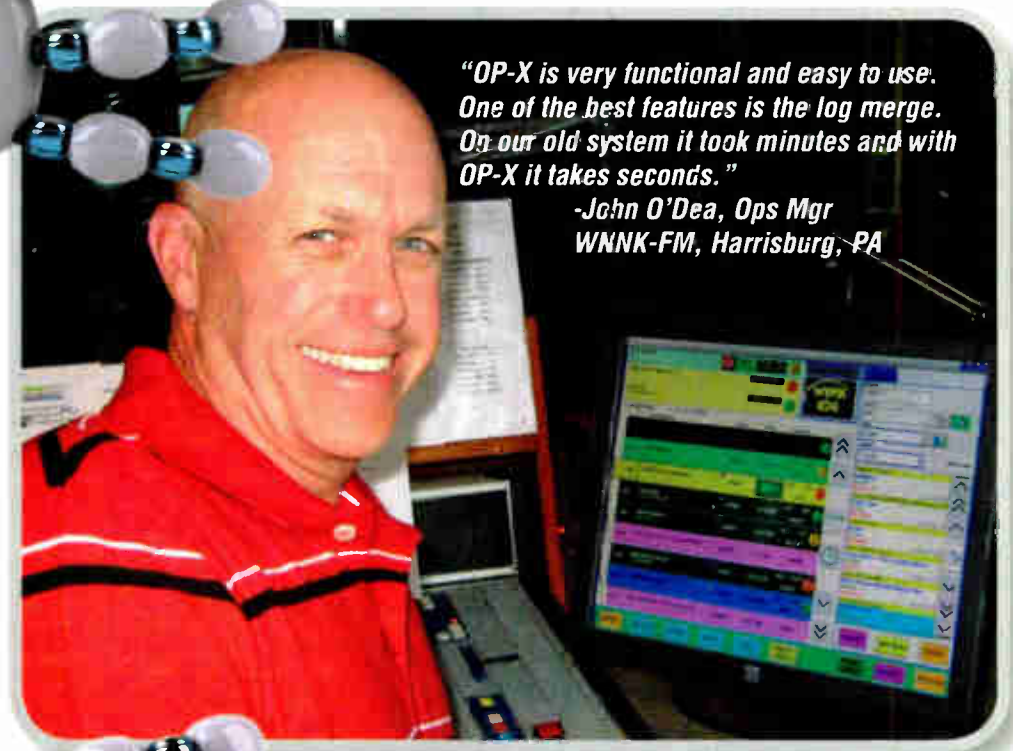
RECTIFIERS WITH MOVING PARTS

One of the most intuitive and well-developed methodologies for converting AC to DC was via rotating machinery — motor-generator sets.

An AC motor of suitable size was coupled to one or more DC generators to provide plate, grid and/or filament voltages. Only a minor amount of filtering was required, and "stock" units could generally supply the DC power requirements of very early broadcast transmitters.

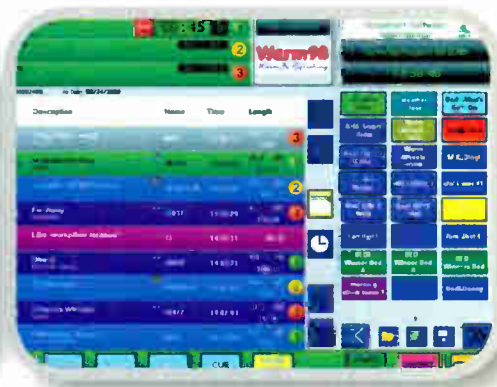
Actually, the motor-generator set became the *de facto* standard for delivering transmitter DC in the decade of the 1920s and on into the 1930s. Initially, units designed for other applications (typically electrified light railway service) were grafted into transmitter power supplies. However, as transmitter size (power) increased, catalog motor-generators were no longer adequate, and at least one manufacturer created a special division to supply transmitter manufacturers and individuals constructing their own rigs.

(continued on page 24)



"OP-X is very functional and easy to use. One of the best features is the log merge. On our old system it took minutes and with OP-X it takes seconds."

*-John O'Dea, Ops Mgr
WNNK-FM, Harrisburg, PA*



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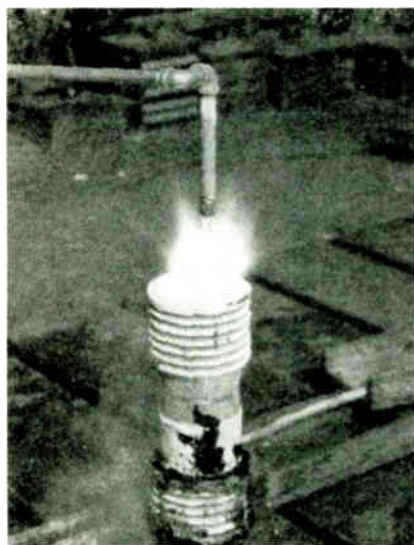
(continued from page 22)

This was necessary, as the motor-generator sets developed for streetcar and interurban rail lines rarely required potentials above 1,500 volts. By the mid to late 1920s, transmitter builders were demanding machines that could deliver upwards of 18,000 volts.

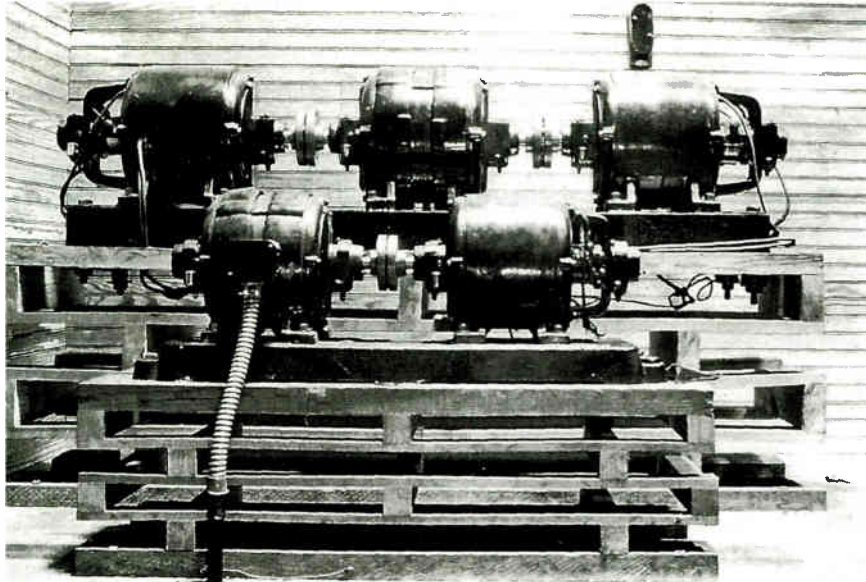
Motor-generators for radio service were special in other ways too. While some amount of ripple current didn't bother the light rail industry, even a slight amount of voltage perturbation could cause problems in transmitters.

"If the generator does not commute without sparks, these sparks will cause pulsations in the voltage, which will also produce audible sounds in the transmitter," Westinghouse engineer J.H. Blakenbuehler observed in a detailed 1928 article on his company's work in producing motor-generators for radio work. "Those pulsations producing the most annoying sounds have frequencies between 500 and 2,000 cycles per second, with probably the most distressing tone occurring at 1,100 cycles per second."

Blakenbuehler also expressed concern over the effect of minute voltage changes on transmitter frequency stability. At that time, many transmitters consisted of little more than a power oscillator stage and modulator. There was no crystal control to keep things steady, and slight changes in plate potential could cause frequency shifts (as could the change in capacitance due to the station's flat-top or cage antenna being



Water rheostats were used as a load for testing high-voltage DC generators intended for radio transmitter duty. This Westinghouse device actually "burned" water in normal operation. The flame at the top is due to the spontaneous recombination of hydrogen and oxygen generated by the electrolysis effect on the water being pumped into the unit during operation.



These motor-generator sets powered the University of Arkansas's KUOA for several years. They were located in the basement of the school's 'Old Main' building, with the transmitter situated four stories above and feeding a roof-top antenna.

blown about by the wind).

"Generators with poor regulation have been known to vary the signal frequency so much as to cause the reception by a heterodyne receiver to be very difficult," Blakenbuehler cautioned in an obvious pitch to tout the superiority of his company's products.

The very high output voltages and output stability necessitated a complete redesign of existing motor-generator products, with some of the Westinghouse devices for broadcast service requiring six miles of wire for the armature of a four-pole generator, and an additional two miles for the field coils.

Factory testing methods for these high-voltage motor-generators had to be modified too. According to Blakenbuehler, ordinary carbon resistor loads used for testing lower voltage generators proved too expensive and unsafe, so another type of load had to be developed: the water barrel rheostat.

This device, shown in the accompanying photo, was essentially a hollow porcelain tube, with an electrode (anode) positioned inside. The other electrode was a stream of water (probably made conductive by addition of a weak acid solution) that was connected to the generator's negative terminal. Water flowed into the tube, completing the circuit and presenting a load to the generator.

Blakenbuehler noted a "peculiar" phenomenon experienced when such a load was tried with very high voltages.

"The current density at the cathode was evidently so high as to decompose the water into hydrogen and oxygen, which recombined in a flame at the surface of the water." The "burning water" is evident in the photograph.

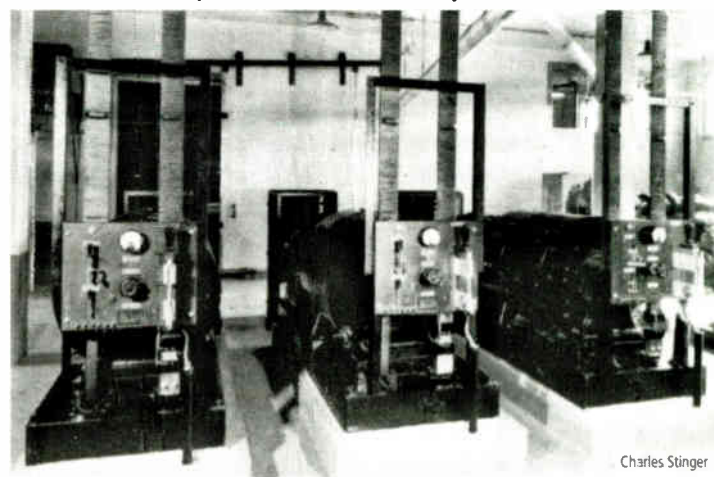
CONQUERING AC HUM

In 1924, radio pioneer Loy Barton

became a motor generator customer, specifying a motor-generator set for the plate supply of the 500 watt broadcast transmitter he designed and constructed as part of the requirements for an advanced degree at the University of Arkansas.

His thesis reflected difficulties with powering the school station's transmitter, primarily AC hum problems.

Barton was so perplexed that he wrote engineers at most of the stations on the air then to find out if they had hum problems and how they licked

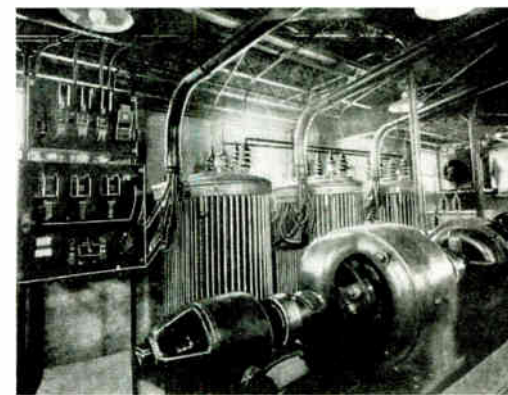


Perhaps the most famous transmitter using motor-generator sets was the WLW 500,000 watt machine that went on the air in 1934. Three 1,500 amp devices were used to power the filaments.

them. The consensus was that if hum was to be avoided, in addition to pure DC for plate potentials, transmitter tube filaments also needed fairly pure DC. (Of the 70 stations polled by Barton, approximately 50 responded, with the overwhelming majority saying they had to resort to DC for lighting filaments.)

Barton reasoned that the hum occurred due to a very slight physical movement of the large filament structure in power tubes at a 60 cycle per second rate, thus creating hum modulation of the signal.

He initially tried several schemes to null the hum component, but none



As the size of transmitters grew, some installations resembled power generating stations due to the use of motor-generator sets for providing DC voltages. This is part of the equipment room associated with WOWO's first 50 kW transmitter, constructed in the late 1920s. (Curiously, the station never operated it beyond 10 kW, only going to 50 kW in 1954 with a more modern transmitter.)

proved really satisfactory and he eventually ordered a 15 volt/100 amp motor-generator set for transmitter filament power.

As broadcasters opted for higher and higher transmitter powers, Westinghouse and other suppliers of broadcast-type motor-generator sets were kept busy churning out new designs to meet the requirements of the larger tubes being employed. In photos of installations from that era, some station transmitter facilities look more like electrical power stations than broadcast operations.

One of the most famous of these was WLW. The station's 1934 makeover into a 500,000 watt facility initially required 20 of the huge UV-862 100,000 watt tubes, each with filament requirements of 207 amps at 33 volts DC. At the time of construction, the only practical way to supply the 4,140 amps necessary was with

a motor-generator set. WLW actually had three 1,500 amp monsters — each driven by an 85 HP motor — and installed in the basement directly under the transmitter. They were paralleled together with copper bus bars resembling small HVAC ducts.

When we conclude our discussion next time, we'll start with a motor-generator installation in Las Cruces, N.M., that was involved in a tragedy.

James O'Neal is a technology editor for TV Technology and a frequent Radio World contributor. Comment on this or any article. Write to radioworld@nbmedia.com.

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KUNV Comes Home With New Facilities

Jackpot for Vegas Broadcaster Includes New Equipment, Studios and HD Radio Signal



Author Frank Mueller records KUNV General Manager David Reese in KUNV's Recording Control and Performance studios. Recording is done with Adobe Audition using a Yamaha O2R board. Reese is on a Rode NT2000 mic on a Yellowtec m!ka mic arm.

BY FRANK MUELLER
Operations Manager
KUNV(FM)

LAS VEGAS — Having two major projects scheduled to finish within a year of each other can be overwhelming, but KUNV(FM)'s staff, volunteers and contractors have shown that they were up to the task.

FACILITYPROFILE

September of 2009 found us moving into new studios on the University of Nevada, Las Vegas campus after 10 years of being a couple of miles from our sponsoring university. September of 2010 saw the launch of our HD Radio signal.

Innovative solutions have been key in completing both projects while working around technical and environmental difficulties, budget shortfalls and anticipation of future demands.

NEW STUDIOS

KUNV's new studios shine with furniture and equipment that provide staff, volunteers and students with an environment to rival some of the top commercial radio stations. Rooms designed by the Russ Berger Design Group ensure superior sound performance. All studios

(continued on page 28)

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▶ MARKETPLACE

PUT A RIBBON ON IT: Not often does former radio engineer Doug Fearn put out a new product. And in these days of digital domination, a big-box analog tube preamplifier aimed at the ribbon mic market would seem more like offering a mahogany-handled customized buggy whip



around 1920. Maybe with some snazzy silver threading, gold inlay and a lion's head pommel, too. Way cool and the horses will love it!

Yet perhaps it's not so silly. Ribbon microphones have a solid niche and there are a lot of studios not afraid to pay for quality. Radio broadcasters looking for a "sound" might want to give a ribbon chain a listen.

The new gizmo, the VT-12, is a two-channel preamp with traditional VU meters on the front of a big 2 RU box in familiar Fearn Red. Classic toggle switches handle 48 V phantom power, phase, meter, power and 20 dB pad. The VT-12 can also handle condensers and even dynamics. A 48 V lockout allows initiating phantom power or locking it out to spare your precious ribbon mics. Specs promise a whopping 70 dB gain.

Doug, a Radio World contributor in his radio days, said of his latest: "Ribbon microphones have made a well-deserved comeback in the recording world, and the VT-12 has the gain required to use any ribbon microphone and still have the classic musicality our designs are known for." Price: \$3,295.

Info: www.dwfearn.com

SILENT GREEN: For those wracked with guilt that their acoustic treatment is a burden for the planet — petroleum product, exotic hardwood,



etc. — Auralex rides to the rescue with Sustain Bamboo Sound Diffusors.

Made from fast-growing and easily replaced bamboo, the Sustain series is available in various acoustic treatment product configurations: pyramids, slats and those checkerboard designs that look like curio holders when mounted on a wall. Also available are KeyPac perforated panels for mounting with Auralex ProPanels or Studiofoam. KeyPacs can temper the amount of sound absorption a room has. And if

you're still having unexplained guilt pangs with Sustain Bamboo, Auralex adds that the bamboo used for its products isn't the same bamboo that pandas eat.

Info: www.auralex.com

NEW FRIENDS: Axia Audio, developer of the Livewire IP audio networking standard, announced that Burli has become an Axia Partner. The takeaway is that Burli Newsroom automated software system will become compatible with Livewire networks. Burli

General Manager Ian Gunn said: "A good number of our mutual clients are already running both Burli Newsroom



software and Axia IP-Audio gear ... and they've asked whether we might collaborate to enhance integration between our products."

Info: www.axiaaudio.com

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KUNV

(continued from page 26)

use a combination of angled walls and windows; baffling on the walls and in the air ducting; varying ceiling shapes and heights; air gaps in the walls; and isolated floors to ensure a high level of "deadness."

Furniture in the studios was custom created by Omnirax Broadcast Furniture to match the space and technical requirements of each area. Herman Miller chairs compliment the modern furniture.

Spring noise from previous mic booms was a constant annoyance, so in selecting the arms for this studio we were impressed by the Yellowtec m!ka solution arm system. In use we've found them to be a superior solution with all but some of the heaviest microphones.

As our on-air staff is large (more than 30 volunteers), our microphones see a lot of work for several types of voices and handlers. We wanted to make sure we had mics in our two on-air studios that wouldn't color the voices and would also be near bulletproof. We selected the Shure SM7B and have found them to be durable with a clean sound.



KUNV Host Greg Magnusson sits at the HD1 air studio's Axia control surface. ENCO Systems automation can be seen in the background. The mic is a Shure SM7B, its arm is a m!ka with a tally light.

er-based interface, as well as for the RAID configuration that allows for hot-swapping the drives easily without risk of data loss. The NAS, along with other equipment not required to be in-studio, are stored in a technical operations center where their heat and noise have no impact on our studios.



A UNLV student practices audio production in one of the edit booths using Adobe Audition. M!ka arms, Axia board and EV RE20 mics visible.

One of the challenges was to take our massive CD library (approximately 10,000 CDs) and move into the 21st century by digitizing it.

One of the challenges associated with the move was to take our massive CD library (approximately 10,000 CDs) and move into the 21st century by digitizing it.

As we had not yet settled on an automation system at the time we began the conversion, we wanted to use software that would implement a naming convention that could be imported by any system into a database to affiliate with the audio files.

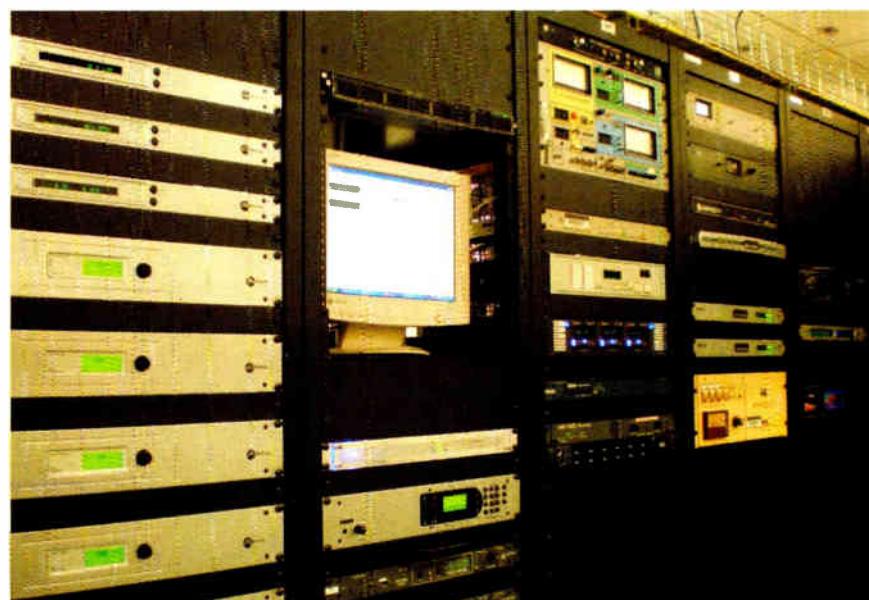
CD LIBRARY

We settled on Exact Audio Copy, which allowed us to write file names containing all necessary data using a common delimiter between fields. We found it to be a superior program not only for the naming convention but that it was able to autocomplete information for the vast majority of our CDs by retrieving data from the FreeDB online database.

Of course, we needed a place to store all of those audio tracks. In combination with UNLV's TV broadcast facility, which also joined us in the new facility, we went with a Rorke Data Galaxy network-attached storage systems (NAS). The system has been nice both for the ease of configuration through the brows-

When it came time to select an automation system, we wanted one that was both flexible and easy to use. Many of our volunteers are from an analog background and we wanted an interface that would be fairly trouble-free to adopt. A presentation from Brady Sharp, a sales representative with ENCO Systems, changed our mind from our original choice; and we have found that the folks at ENCO work constantly to improve their software. Additionally, their technical support and online community are great assets.

From the beginning of the project we knew we wanted an audio-over-IP solution that would match our goals for HD Radio broadcast. We chose Axia's Livewire system due to its compatibility with so many other vendors as well as its well-thought-out design. It is a decision we have never regretted. The Axia software and hardware are top-notch. The hardware still looks like new after a year of heavy use and the audio delivery has been flawless. Additionally, we found the combination of their audio delivery with a new Omnia 6 EXi processor so improved our audio quality that we had listeners calling us and telling us that we



KUNV's rack space in the TOC includes Omnia 6EXi and Omnia One processors, Axia engines and audio nodes, Comrex Access, Arbitron PPM encoders, Public Radio Satellite System hardware, streaming server/encoders and iMediatouch skimmer. Also at work is gear from Sage, Broadcast Tools, DaySequerra, QEI, Orban, Moseley and Belar, among others.

sounded noticeably better.

We also wanted to make sure we had a recording facility to match our broadcast facility. We had used an old broadcast audio board in our old facility and knew we wanted something more dynamic. We also wanted something that would incorporate a DAW and would deliver audio-over-IP to the recording and post-production systems.

We ended up going with a Yamaha 02R board paired to an ADK Quad Core system with 4 GB of RAM and Adobe Audition 3 for recording and editing. The system has a Digigram LX6464ES interface card that works with the Yamaha via EtherSound. We have had trouble a couple times where the Digigram system lost its settings, but restoring from a backup is fairly quick and the quality of recording is light years beyond what we had before.

It also helps that we paired the sys-

tem to an array of quality microphones, the topmost of which are a set of Rode NT2000s. Additionally, we made sure we provided a high-quality recording environment using a boxed room structure for the main room, a floating floor for the ISO booth and air-gapped walls and sound-rated doors for all remaining studios.

We wanted to make sure recordings and live broadcasts sounded as good on the road as in the studio. For live remote broadcasts we opted for the Comrex Access codec system with optional mixer. The flexibility of connections is bar-none and the sound quality is exceptional. Since we are in Las Vegas, other stations periodically call on us to record conventions, events and interviews. Field recordings are handled either through an HP laptop with Adobe Audition and a Digigram UAX220 USB audio interface or, for lighter work, a Samson Zoom H4 solid-state digital recorder.

As we moved towards HD Radio, we wanted to make sure the quality didn't break down at the STL. Additionally, we wanted plenty of bandwidth for future expansion. We were wary of operating in the unlicensed space.

We decided to go on a DragonWave Horizon Compact microwave system based on a recommendation from Axia and have found it a solid solution. We get 300 Mbps throughput and operate in the 11 GHz licensed range.

HD CONVERSION

Once we had the broadcast and recording facilities in operation, we immediately turned our sights on an HD Radio conversion. Thanks to the generous support of the Corporation for Public Broadcasting, along with an allotment made by UNLV, the funds were available to move forward quickly.

In our initial proposal for HD conversion, we planned to combine at the antenna using an ERI dual-input system. However, in working with American Tower, who owns our transmitter site, we found there were no available towers that would support the antenna and signal protection prevented us from moving to another site without going directional, which was out of consideration. We therefore had to adopt a low-level combining solution.



The full-time staff. Front, from left: Music Director Kim Linzy and Development Director JoAnn Kittrell. Rear: Operations Manager Frank Mueller, Business Manager Gretchen Rexroad and General Manager David Reese.

The floor space in our current transmitter facility is limited and at first we were unable to find a transmitter that would fit in the space of the outgoing Broadcast Electronics 10S; but we found one through sales representative Ellis Terry at Nautel. We went with their NV20 transmitter to allow us up to -10

dB of HD power while running at 10 kW analog. Not only were we impressed at their efficiency in combining, but have been blown away by their remote Web interface for monitoring and configuration changes. We can change exciters, input sources and levels all from the convenience of a browser. Nautel also

provided our importer and exporter.

Listening to some other HD Radio stations in various parts of the country taught us some things we did and some things we didn't want to do.

First, we wanted to make sure our HD Radio signal was processed well. Omnia provided us with their Omnia One processor and we have been pleased with the sound.

Additionally, we didn't want to have constant problems with finding out from a listener that we were out of sync between our analog and HD signals or that our PAD was not displaying. We've been happy with Belar's FM HD monitor to keep us on track on both fronts.

We also took the opportunity during the upgrade to add an RDS generator in the form of a Broadcast Electronics RD120.

Finally, we would be remiss if we failed to mention the great help we received from Joe Sands and Ray Ragle with Desert Sands Engineering. Dennis Todd with Todd Communications and the folks at Azcar. One major project is enough of a team effort. Two requires a crew of true professionals and we couldn't have asked for better.

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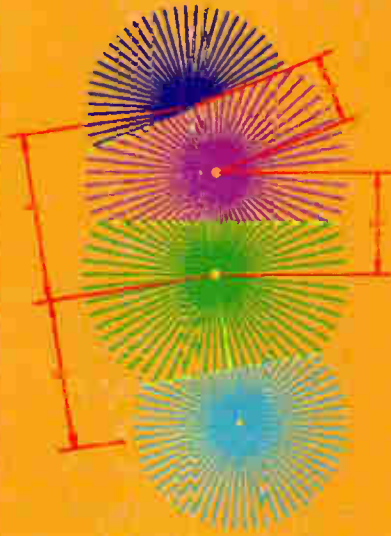
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Selling HD Radio on AM/FM Radio

The Spots Promoting Digital Radio Are Fun, But Something's Missing

For over four years now, I've been entertained by the advertisements created to generate interest in HD Radio. The ads are often so clever that I laugh out loud. The acting has been consistently excellent. The production quality has been superb.

Over the years, I've also heard a lot of these ads placed with good frequency in drive times when most people are tuned in to AM and FM stations. But something is missing. While these advertisements have unquestionably helped pique curiosity about HD Radio, here in 2011 it's time to take the marketing of HD Radio to the next level of success.

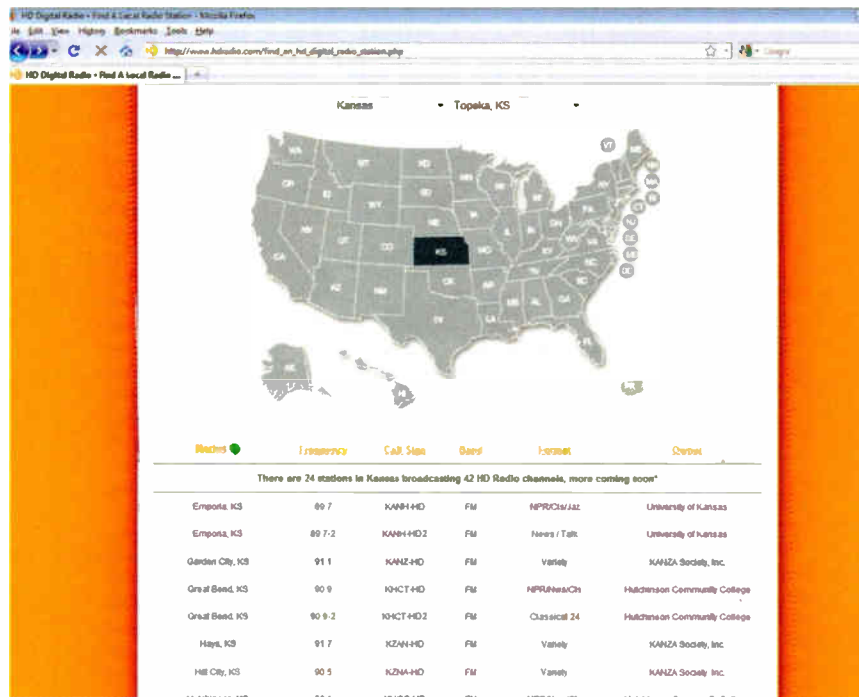
CONTENT COUNTS

Few in our industry will argue with the premise that the reason most people listen to any kind of radio is to be entertained or informed.

This is precisely what is missing from the now hundreds of spots that have been created to promote HD Radio. To date, the ads I've heard have been too much about the HD Radio brand and not enough about what consumers will actually be listening to when they buy a new HD Radio for the car, home or office.

During 2011, I'm hoping HD Radio ads will finally tell consumers exactly what they can hear on HD for free, right now, in the city where they live.

We must put an end to the notion



The website of the HD Digital Radio Alliance lets users find stations by city or state. The author argues that stations need to create their own local HD Radio websites that list all stations in their market as well as local retailers who sell receivers.

that if we tell consumers they can hear "lots of new stations," they will flock to buy the HD product. The detail communicated this year must be specific. It has to be accurate. Most importantly, it must be local.

Let's be specific by naming the actual formats available for free in your town. Example: "Here in Raleigh on HD Radio, you can now hear 15 new radio stations. The music stations include blues (clip), jazz (clip) and classic coun-

PROMO POWER



Mark Lapidus

try (clip). Unlike satellite radio, these stations are free. Get the list of stations now at HDRadioRaleigh-Dot-Com."

Another approach is to spend the entire spot on only one format in order to get those potential listeners really motivated to make the purchase.

NON-PARTISAN EFFORT

I take you now to the HD Radio boardroom, where one will find corporate guys debating the validity of this claim that unique local content can sell radios.

Suit #1 says, "Lapidus has an interesting idea, but it's too hard to get local stations to do the ads themselves. Plus, the local ads won't sound as good as the national ads we do now."

Suit #2 jumps in with, "People buy HD Radios because of the superior sound. If they really care about formats, they'll go to our corporate website and find out more about what's in their area."

If I were in attendance, I would argue that most stations these days are perfectly capable of cutting great spots themselves — and if HD Radio ran a contest for the best local ads created by stations (and perhaps giving HD Radios to the winners), they'd have lots of excellent examples to play for the other stations to influence their creativity accordingly.

Further, the local clusters could take turns cutting ads for the whole market. At this point, partisanship in promoting only one cluster's HD stations is truly counter-productive. We have to get people in mass numbers to purchase radios and only then can we compete for those listeners, which now would be like fighting over crumbs.

Moving on to Suit #2's claim to the lure of superior sound, I'd point out that while fidelity is important to audiophiles, most listeners would need a side-by-side comparison in order to tell the difference between FM and HD, especially in a noisy car. In the words of an acquaintance, "FM is good enough for me." To appreciate high-quality audio enough to buy HD, Joe Listener first has to be able to envision what he'll be hearing on it.

IDEAS

I mentioned the value of creating a local HD Radio website, just for your city. Again, this one site would list all the stations on HD Radio in your city, not just those in one cluster. It would also list local retailers who sell HD Radios.

(continued on page 32)

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World Radio History

Can You Do a Lot With 0.1 Watt?

Pacifica Station Uses Low-Power AM
To Help Reach Spanish-Language Listeners

BY JAMES CARELESS

Pacifica Radio's Los Angeles station KPFK(FM), airing at 90.7 MHz, broadcasts in English and Spanish. Unfortunately for some listeners, though, the Spanish programming is only aired 9 p.m. to midnight, Mondays to Thursdays. That's not exactly prime time, especially in a market that, according to Arbitron, has 4.6 million Hispanics age 12+.

Ideally, Pacifica Radio would add a Spanish-only radio station. But even assuming one were available, Pacifica is a listener-funded network with significant funding challenges.

This is why KPFK is turning to low-power AM transmitters to reach Hispanic neighborhoods in Los Angeles. The plan, arguably a stop-gap, could bring KPFK's Spanish programming to at least some Hispanic areas quickly and cheaply.

"With a few LPAM transmitters and antennas, we can cover MacArthur Park," says KPFK Program Director Alan Minsky. "About 50,000 people work in this area right now. That's a big audience that can be reached in a very affordable manner."

THE RULE

Low-power AM is governed under Part 15 of the FCC rules, in Title 47 of the Federal Code of Regulations.

According to www.fcc.gov, LPAM broadcasts are "limited to an effective service range of approximately 200 feet (61 meters) ... These devices must accept any interference caused by any other operation, which may further limit the effective service range." LPAM transmitters also are limited to an output of 0.1 watt, and

their antennas cannot exceed 3 meters in length. (The rules vary somewhat for carrier current and "leaky coax" systems.)

Though such systems might only cover a few blocks, they have two big benefits: they require no license, and they are relatively inexpensive. For example, a Hamilton Rangemaster AM1000C Outdoor Crystal System comes with a Part 15 LPAM transmitter, antenna, mount bracket, Belden wire and meter, all for \$850.

'The short range of LPAM coverage allows us to reuse the same frequencies.'

"For us, the challenge comes down to finding locations to mount our LPAM transmitters/antennas, and locating open spaces on the AM band," Minsky told Radio World.

"Fortunately, people are willing to give us access to building space — these LPAM units are small and hardly use any power — and there are lots of open areas on the AM band, especially because the short range of LPAM coverage allows us to reuse the same frequencies around the city."

THE FEED

KPFK does not have the budget to create a Spanish-only radio service in-house, but it does have the resources to solve its



Alan Minsky

content problems using the Web.

"Specifically, our plan is to create a 24/7 Spanish-language audio stream," Minsky says. "It will feature KPFK's existing Spanish-language programming, bolstered by repeats and content drawn from other sources."

Once the audio stream is available on the Web, the rest is easy. KPFK installs LPAM transmitters/antennas in its target areas, connects each system to a Web-connected PC audio output, and presto: Instant AM network.

If the site offers antenna locations on two or more faces of a building, the PC's audio feed can be shared between them. Alternatively, if the LPAM site can receive the KPFK feed off-air on one AM channel, it can retransmit on another. This would reduce equipment costs further.

THE PLAN

In November, KPFK was putting together the content for its Spanish-language audio stream. "Once it is up

and running, our first goal is to set up a few LPAM transmitters in the downtown and near-downtown areas of L.A."

This said, Pacifica Radio's ultimate goal is to launch a full-powered Spanish language radio station someday, when that goal becomes economically feasible.

Minsky acknowledges that L.A. is too big to even dream of covering it with an LPAM network.

"We're well aware of how vast Southern California is," he says. "The LPAM plan is, at the most, to try to blanket one or two densely populated areas — our first target area is not only a neighborhood with thousands of residents live; but more importantly, a neighborhood where tens of thousands of Spanish language speakers work."

For Pacifica Radio, LPAM offers an economical if unorthodox venue for serving L.A.'s Spanish-speaking audiences.

"As a socially progressive broadcaster, we offer content to the city's Hispanic population that no one else has," Minsky concludes. "We don't have the money to reach them using HD Radio, which hasn't had much of a significant uptake anyway. But we can do it with LPAM — and the people we broadcast to have access to AM radios today."

Radio World e-mailed and called the station in December and January with followup questions including the nature of the antenna, how many transmitters are planned and whether the first ones had been employed. We had not heard back as of press time.

The FCC Office of Engineering and Technology offers a bulletin on its website, "Understanding the FCC Part 15 Regulations for Low-Power, Non-Licensed Transmitters." Find it at www.fcc.gov/oet/info/documents/bulletins/#63.

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SELLING HD

(continued from page 30)

Perhaps you could even get these local retailers to offer special sales (or coupons) several times a year to highlight something special only on local HD Radio in your city.

Example: "The Permian High game against Odessa on Friday is available only on HD Radio. Get your HD Radio for 30 percent off this weekend only at The Sound Exchange."

Aside from creating very specific local ads, here are a few quick promotional thought starters:

1) Create weekend specialty shows on your AM or FM station that mirror the format of one of your HD channels. Example: Air a two-hour blues show Sunday night on your classic rock station with lots of

references to your new blues radio channel on the HD Radio dial.

2) Do short segments on your AM or FM stations that promote one of the HD formats. Example: "Weather is now available 24 hours a day on our new HD Radio station featuring continual live reports from the National Weather Service."

3) Totally simulcast one of your HD channels on your AM or FM station for special occasions, continually promoting that the broadcast is temporary and can be heard full-time only on HD Radio.

Does HD Radio have a future? I'm still a strong believer, but ultimately, it's the consumer who needs convincing.

The author is president of Lapidus Media. Contact: marklapidus@verizon.net.

PEOPLENEWS

Jeff Nalley was named 2010 Farm Broadcaster of the Year by the **National Association of Farm Broadcasting**.

He's farm director at Cromwell Ag Radio Network in Nashville, Tenn. He helped to start the network and is sole employee, offering 36 programs daily.

NAFB named two members to its Hall of Fame: **Taylor Brown** of Northern



Jeff Nalley

Ag Network in Billings, Mont., and **Gene Millard**, broadcaster at KFEQ Radio in St. Joseph, Mo. **Roger Olson** of the National 4-H Council and **Denny Waddle** of KRVN/Rural Radio Network received the Dix Harper Meritorious Service Award. **Haylie Shipp**, farm broadcaster at Northern Ag Network in Billings, received the Horizon Award.

Skip Pizzi was named director of digital strategies at the **National Association of Broadcasters**. He reports to Lynn Claudy, senior vice president of science and technology. Pizzi, former



Skip Pizzi

contributing editor of Radio World, most recently was technology editor at Radio Ink magazine and has worked as a media technology consultant. He began his technical career at NPR and has worked in digital media at Microsoft Corp.

Greater Media promoted **Jennifer**

Williams to director of interactive marketing of the company's 23 radio properties. She was director of interactive marketing at its Detroit-based stations. Prior she was marketing director for WCSX(FM).



Jennifer Williams

Orban promoted **David Coggins** to director of manufacturing. He's been engineering product manager since 2007. He has experience in mechanical and electrical design, CAD



David Coggins

design, document control, test procedure and project management. He's based in Scottsdale, Ariz., and worked at Arizona Instrument LLC as a design engineer and project leader prior to joining Orban.

WideOrbit Inc. named **Dan Ackerman** as general manager of WO Central, an online marketplace for agencies and advertisers to purchase ad inventory from WideOrbit stations and networks. The company also added two

to the support team for its WO Automation for Radio line. **Phil Kelly** returns after an 18-month absence and **Andy Salive** came on board. Both were with Clear Channel Communications.

The **New York State Broadcasters Association** said **Joseph A. Reilly** will step down as president in June. "Since taking over the reins he has helped transform this association into a major and respected player in the affairs of New York



Joseph A. Reilly

State," said Board Chair Theresa Underwood. Reilly was the trade association's first full-time executive director; he joined in 1979.

The **National Federation of Community Broadcasters** named Doug Mitchell as project manager for the African American Public Radio Station

service grant funded by The Corporation for Public Broadcasting. The project is intended to help 28 stations in training, community engagement, local programming, licensee relations, development and other areas.

Kent Dimon was named director of licensing by **Aphex**, working with General Manager Rick McClendon, Product Development Manager Jim Bailey, CEO David Wiener and COO Robin Sibucuo.

SPX Communication Technology (formerly Dielectric) said **Hans Dahlén** joined as international sales manager for the European, Asian and African regions. He is based in Sweden. He worked at Exir Broadcasting and Telecom AB, where he was general manager for the broadcast division and coordinated product research and development, budgeting, production, sales and support.



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'Stop the Analogue Radio Switch Off!'

The United States isn't the only country where a digital transition has caused strong feelings. Imagine how the debate would be going in the U.S. if an analog service "sunset" were suggested.

The U.K. has proposed 2015 as a target date for a switch-off for analog broadcasting, but it also established numerous preconditions based upon certain levels of receiver penetration, digital radio listening levels, availability of in-car and other mobile receivers, robustness of coverage area, etc. Analog radio fans have been quick to paint the 2015 date as a firm switch-off date; the British government has stated that switchover is dependent upon public uptake of the technology.

Despite the preconditions set for a 2015 analog sunset, and a general consensus that those preconditions will not be met, there is some vocal opposition to the target date. The commentary shown here appeared in a recent issue of the British Vintage Wireless Society's bulletin, a quarterly publication. It was written by the group's Mike Barker. ("MP" means member of Parliament, "Ofcom" is short for the regulatory body Office of Communications.)

Learn more about the BVWS at www.bvws.org.uk.

Disappointing Audio Broadcast

This is a call for all members to put pen to paper and send the UK Government a *Strong Clear Signal!*

I am asking you to write a letter to your local MP and lobby them to halt the plans for the Analogue radio switch off which is targeted for 2015. This is a totally unnecessary move to force the change to digital radio without any real benefit to anyone other than the failing DAB radio industry and profitless commercial broadcasters. We cannot prevent the eventual switchover, but we can make it clear that this is neither the time to do it, nor the correct system to use. Below are the most salient points that you should make very clear in your letter.

Ofcom research shows that 4 out of 5 listeners are happy with current choice of analogue stations and audio quality.

Power consumption of DAB receivers is much higher. Typically an AM/FM radio will give 375 hours of listening on batteries costing £6 where a similar quality DAB radio only gives 32 hours at a cost of £9. This is an unacceptable increase in listening cost for everyone and especially those on low incomes and pensions and increases the cost of responsible battery disposal. It is also true to say that mains powered DAB receivers are more power hungry.

The DAB system used in the UK is now obsolescent with only two other European countries using it. Any digital broadcasting should be using DAB+ with the more efficient AAC codec instead of MP2 of the 1980's. FM on good equipment will always beat DAB for sound quality without annoying

"drop-outs" and background "bubbling mud" noises. FM works well in large built-up areas and when in vehicles. DAB requires many extra smaller relay transmitters to give the same coverage as FM or AM.

Massive cost to consumers to replace the approx 150 Million perfectly good working receivers with inferior sound quality DAB receivers that suffer from a multitude of reception problems.

Recycling of analogue receivers will only cover modern portables, the rest will be confined to land-fill.

The Government are actively looking for ways to reduce spending so halt the building of new transmitters which will cost a huge amount of money to get full nationwide coverage, when the house of Lords report on digital broadcasting in the UK states that FM transmitters can be maintained fully for the next 20 years for £200 Million which is less than 20 pence per person each year saving listeners millions not having to buy new equipment.

Millions of listeners using built in vehicle receivers will be lost because of inadequate mobile DAB reception and no mass-produced cars yet include DAB receivers fitted as standard, and are not likely to for years to come.

You should write as a personal protest in respect to your own personal situation and how it will affect you and not as a vintage wireless collector, nor as a BVWS protest. The BVWS Committee will be sending a letter directly to the Prime Minister with these points and many more.

The Bulletin



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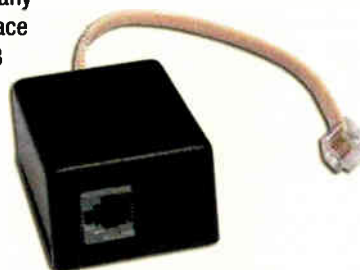
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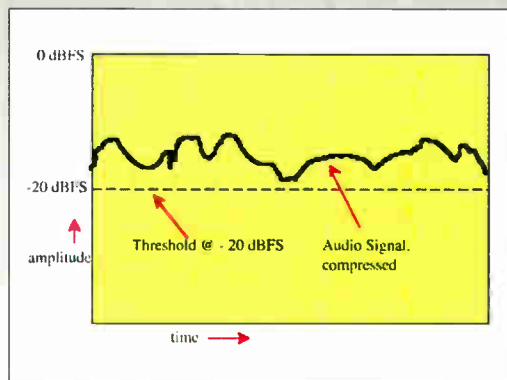
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Radio World Talkback

Comments shown were posted by readers to stories that appear at radioworld.com.

"I've been in radio for 30 years and have even developed a few processing circuits of my own, but I would have to say that this is the best article on audio processing I have ever read. It distills a complex process into understandable terms which are quite accurate, but still simplified enough to be clear. Well done!"

— On "Compressors: Often Used But Often Misunderstood," by Dave Moulton. See www.radioworld.com/article/95130



"I understand your frustration and agree that public tax funding of NPR results in a suffocating status quo conformity control. But as long as public broadcasting stays on the teat of public tax-dollar funding they will suffer this control by arrogant central planners. The tax dollar funding needs to be ended, not relocated. NPR more appropriately stands for National Progressive Radio. Regardless of the slant, the people's tax doilars should not be used to support broadcasting of a particular political religion, left or right. So why is this sacred leftist cow protected? Put it out in the field with the rest of the mastitic radio cows about to be sent to the techno-obsolent slaughterhouse."



— on Pete Simon's commentary "NPR Should Look Beyond the Beltway," see www.radioworld.com/article/111576

"The first EAS system was never implemented properly and for all intents and purpose, never really worked. The new version will end up the same way, an ineffective system that puts a burden on broadcasters with no benefit to the public. CAP is another bureaucratic boondoggle."

— on "Abbott: We Need More Information," see www.radioworld.com/article/111394

"It makes sense to put an AM daytimer on an FM translator for EAS alone! Come on FCC, be smart, put this translator on the air as a simulcast of the local daytimer AM station!"

— on "N.J. AM Station Loses Second Translator Appeal." The station had hoped to use the translator to add nighttime service. See www.radioworld.com/article/107500

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Our readers have something to say



It's a New Day for the Radio Dial

A Historic Victory, and the Road Ahead for Low-Power Radio

BY BRANDY DOYLE

The author is policy director of the Prometheus Radio Project, which advocates for low-power community radio.

After three runs in Congress and 10 years of mounting grassroots pressure, the Local Community Radio Act was signed into law on Jan. 4. Radio lovers, would-be independent broadcasters and communities without access to local media are celebrating a new day for the radio dial.

Low-power stations save lives during emergencies, like WQRZ(LP) in Bay St. Louis, Miss., did in Hurricane Katrina, or KYGT(LP) did during a 2003 snowstorm in Idaho Springs, Colo. They give voice to underserved groups, like the Hmong community programs on KRBS(LP) in Oroville, Calif., or the disability community show on WSCA(LP) in Portsmouth, N.H. And they bring young people to the art of radio, like the "at-risk" youth on KKDS(LP) in Eureka, Calif., or the Radio Palante teen programmers on WCOM(LP) in Carboro, N.C.

Above all, low-power radio is participatory, making this service as creative and diverse as our communities themselves.

The new legislation repeals restrictions on low-power FM radio imposed by the Radio Broadcast Preservation Act of 2000. That earlier law, backed by the National Association of Broadcasters, restricted the FCC from allocating LPFM stations on third-adjacent channels, and the new law removes these restrictions.

Although this will allow the FCC to finally begin licensing LPFM stations again, the law alone won't bring community radio to the cities that have been waiting for all these years. Back at the FCC, there are a few more hoops for low-power radio to jump through.

THE GREAT TRANSLATOR INVASION

The new law won't accomplish much if the FCC follows through with a flawed plan that could unintentionally give away most open channels to FM translators.

The plan is aimed at saving channels for LPFM, but new data shows it will do the opposite. How did this happen? When thousands of translator applications flooded a 2003 auction, threatening to fill all remaining open spectrum on the FM band, the FCC froze the auction. They wanted to find a solution that would preserve channels for LPFM and avoid an unprecedented transfer of radio spectrum to speculators and mega-networks.

To solve the problem, the FCC tentatively settled on a 10-applications-

each processing cap, planning to dismiss all but 10 applications from each applicant for translators. Unfortunately, engineering simulations by the public interest group Common Frequency show that the current "10 cap" would be disastrous. As currently designed, the cap would still give most channels in big cities to translators. In fact, one applicant could end up with 10 new translators in the same city, with not a single channel left for community groups.

It would be tragic if the FCC's response to the translator problem inadvertently ends LPFM's new day before it begins. We're open to any idea that preserves LPFM availability in cities, but the easiest way to follow the law's intent would be to process LPFM applications first, prior to those of translators. This way, local communities with a need for low-power radio have a chance to say so, before their hometown airwaves get turned over to non-local translators.

MARY, MARY, SECONDARY

For decades, full-power FM stations and FM translators have used the "contour method" to locate their stations, a technique that accounts for topography when finding available channels.

To create opportunities for LPFMs in cities, the FCC will need to use this industry-standard method, rather than only allowing the distance-spacing method as they did in the first round of LPFM licensing 10 years ago.

The new law authorizes this, giving a green light to the FCC's practice of granting second-adjacent waivers when an LPFM can demonstrate that interference is not predicted. Congress rejected the NAB's attempts to narrow the FCC's authority to granting only "limited" waivers. Instead, the language of the new law gives the FCC broad discretion to offer waivers on the basis of "all relevant factors, including terrain-sensitive propagation models," i.e., the modern contour allocations method used by all other broadcasters.

LPFM stations operating under these waivers accept the same obligations to remediate interference complaints as translators, shutting down until interference complaints are resolved, even if that



'After 10 years of jumping through hoops in D.C., low-power radio is ready to take the show on the road.' LPFM backers protested outside NAB headquarters shortly before the legislation passed.

interference is reported outside the protected contour of a full-service station.

In the end, LPFM advocates supported the legislation despite this requirement, because we know from the experience of translators that this hypothetical interference is unlikely. We plan to work with LPFM stations, full-power stations and the FCC to ensure that interference complaints are resolved to everyone's satisfaction without forcing community stations off the air.

The law also states that LPFM stations will remain secondary to full-power stations.

However, FCC interpretation of secondary status includes some agency discretion to resolve conflicts between low- and full-power stations. The FCC guarantees some protections to low-power stations encroached by full-power stations that move into their signal range.

For example, encroaching stations must warn LPFMs about their move, assist with engineering solutions and help with costs if LPFMs must change locations.

Encroachment affects nearly all LPFM stations, but with continued protections for displaced stations (and stronger support for shortspaced ones), the vast majority will survive unscathed.

CLOSING THE LOCAL OWNERSHIP LOOPHOLE

Despite the FCC's intentions to make LPFM a truly local service, giant networks have gamed the system, operating hundreds of stations that have no local presence. These networks put a local organization's name on the license and then set up a transmitter in a closet to broadcast syndicated programming piped in by satellite 24/7.

Although technically legal, this scam keeps the genuinely local groups — for whom this service was created — off the airwaves. To close the loophole, LPFM stations should be required to produce a reasonable amount of local programming.

New LPFM licenses will be scarce, particularly in urban areas. They should be given to broadcasters who can fulfill the service's potential: local organizations serving local communities with locally produced programming.

So even after this historic victory, there's still a little work ahead. But when it's done, we expect a radio landscape that's more interesting, more just and more relevant to more people. After 10 years of jumping through hoops in D.C., low-power radio is ready to take the show on the road.

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

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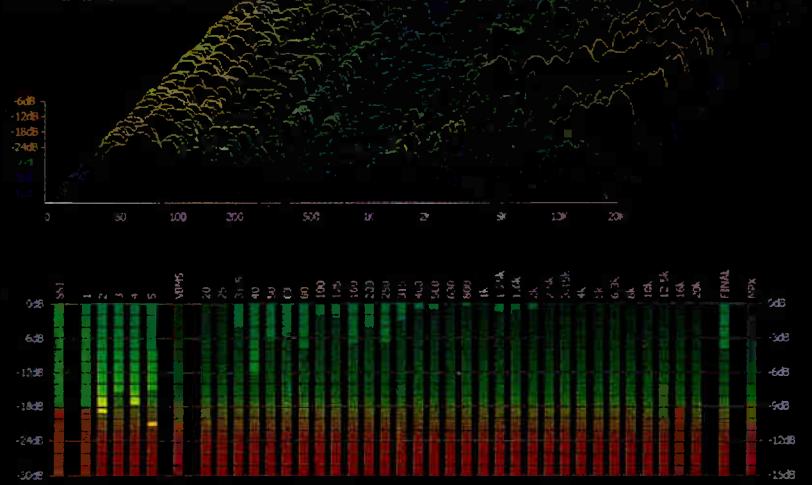
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"I have the HD output feeding our web stream encoder, and two national program hosts at remote locations in the US have told us 'your audio stream sounds incredible!'"

"I can say that the Vorsis processor does NOT sound like the "O"ther guys! It sounds far better and has a very unique 'signature'. I really, really like how this processor sounds! Every other station in the market sounds like crunched up FM radio while our station is loud now and yet it still has "life" with CD quality dynamics and punch."

"I've listened to the station since the first few days after the format flip (which was a month ago yesterday), and the one thing I notice most is that the new Vorsis processor's audio quality is always terrific, regardless of the source material."

"If the Vorsis that I heard while you were testing processors last night is your final air chain (it was) it might just be the cleanest and best sounding FM I've heard since...well, forever. Great work!"

"Thanks for a great sounding box that makes us sound bigger than the so called big stations!"

"Your Sweet Spot Technology AGC has the most invisible gain correction that I have EVER heard in ANY on air processor. Listeners have been calling to compliment us on the improvement in our on air sound."

"We've used your product close to a year now and it's just out of this world. When we put the Vorsis box online our audience noticed the difference instantly and started calling asking questions like 'What's going on? What did you do? Your sound is clear, crisp, and bright and the audio sound level is great now!!!!'"

"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™



IT'S TIME YOU WON THE RATINGS WAR

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.