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INSIDE

THERE'S NO PLACE LIKE NOME

• KNOM(FM), NAB Crystal Heritage Award winner, really puts the remote in remote. — Page 20



Courtesy of KNOM

A BREATH OF TESH AIR

• John Tesh talks to Radio World ahead of NAB Radio Luncheon keynote. — Page 26

BOXES OF POWER

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FM Translator Roulette Begins

Experts handicap which apps will survive winnowing; LPFMs await their chance

BY RANDY J. STINE

WASHINGTON — The FCC has dismissed about half of the applications remaining from the 2003 FM translator window. Analysts are now trying to predict how many survivors will win approval, and speculating about the impact on future low-power opportunities.

The commission in February dismissed approximately 3,000 translator proposals from Auction 83. It said some entrants had failed to submit selection lists or show that their applications fell within new FCC caps. The agency planned to issue further dismissals due to missing, defective or inadequate technical showings, and began doing so later in February.

These actions come after a final rule-making in December that expanded the low-power FM service and will result in a new filing window for LPFMs come October. The FCC called that decision a compromise between the interests of LPFM advocates and translator applicants, one that will allow the two services to complement each other.

But some translator advocates were

disappointed. Even though the commission established a cap of 70 translator applications, increasing its limit from earlier proposals, supporters criticize restrictions that could limit new translators in the top 150 markets (see sidebar, page 10).

Of approximately 3,000 translator applications that remain from 2003, many are in medium and small markets,

according to data compiled by Skywaves Consulting LLC, which is active in FM facility upgrades and run by engineer and former station owner Dave Doherty. Skywaves found that Educational Media Foundation holds the only remaining application for Los Angeles, while CSN International has the single remaining application for Chicago. River Vale Media Foundation holds the only translator applications for Queens and Manhattan in New York City.

Skywaves' data shows that Clear

(continued on page 10)

'Critical Business Shifts' Get the Vegas Treatment

Here's what's on tap for managers at the upcoming NAB Show.

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World Radio History

More All-Digital AM Tests Planned



BY LESLIE STIMSON

More all-digital AM IBOC tests are anticipated this year.

Initial tests were completed in November and December by a group of engineers from NAB Labs, CBS Radio and iBiquity Digital, with assistance from Harris Broadcast Communications and Kintronic Labs. The results have yet to be made public. The aim of the testing was to verify whether the AM signal coverage and robustness are improved with an all-digital signal and to quantify any change.

While NAB Labs is cautiously optimistic about the results, its head, NAB Executive Vice President/Chief Tech-

signal turned on and off for both.

The test station was CBS-owned WBCN(AM), Charlotte, N.C., a 10 kW day/1 kW night non-directional at 1660 kHz. WBCN was chosen because CBS Radio volunteered it, Gage told me, though engineers from radio groups

like WXYT(AM), Detroit, as well as on the omnidirectional so-called 'graveyard' channels such as 1230 kHz," the engineer wrote.

NAB Labs is moving forward with defining a complete test bed, said Gage, who calls himself a "constructive

While NAB Labs is cautiously optimistic about the first test results, NAB's Kevin Gage tells me the initial findings need to be corroborated.

other than CBS attended the tests. In an interview, he said a handful of stations have volunteered for the next round; he couldn't say specifically how many stations are needed because the test plan was still being defined as of mid-February.

The next round of tests may occur by

destructor." His job is like that of a technology scout for the broadcast lobby, to look forward and anticipate how broadcasters can remain relevant and provide products consumers want. Once getting the okay from the board, NAB Labs can move forward with test locations based on its requirements, he added.

So the Princess bought the frog a codec from BSW and everyone lived happily ever after!



nology Officer Kevin Gage, tells me the initial findings need to be corroborated. Hence the need for more trials, to get repeatable results and to test the all-digital AM IBOC signal, both indoor and outdoor coverage — day and night — on stations in various locations using various power levels and equipment configurations.

Members of the Digital Radio Subcommittee of the National Radio Systems Committee received a briefing on the initial tests at CES in January; the NAB Radio Board was briefed shortly after. There will be a paper about the testing at the spring NAB Broadcast Engineering Conference, given by David Laver, senior director of advanced engineering at NAB. That session is slated for Monday, April 8 at 4 p.m., when presumably more details of the test results will be revealed.

For indoor tests, the group used an Insignia Narrator receiver. Mobile tests were also conducted, with the all-digital

early in the second quarter. However, "There's nothing final, and that can change rapidly," he said.

MUCH TO EXPLORE

Sources have expressed a range of descriptions when they characterize the results to me. One said they were good, another that the WBCN results were "nearly flawless."

Gage was more cautious, saying only that the all-digital at least matches the analog contour. He stressed several times that the test results need to be corroborated. Noting that WBCN is on the expanded band portion of the AM dial, he said the results were "positive enough for us to move forward with the next round of testing so we can see the effect across the entire band."

That's in line with what one engineer suggested when I reported on these developments recently on the Radio World website. "Digital AM should be tested on complex directional arrays,

Within the test group, broadcast engineering consultant Dennis Wallace of Meintel, Sgrignoli and Wallace was among those participating for NAB Labs. CBS Radio Senior Vice President of Engineering Glynn Walden helped establish the test plan and observed the daytime testing; Market Engineering Manager Allen Lane took part as well, especially preparing the transmitters before testing.

OPTIONS DISCUSSION

The FCC in 2002 approved implementation of the so-called "hybrid" HD Radio technology, meaning that U.S. AM and FM radio stations could broadcast digital on their existing frequencies, along with their analog signals, if they wished. Going "all-digital," in either band, was seen as an option for a distant future, one that would require further regulatory changes.

It's been some 10 years since there was any testing of the all-digital AM IBOC

(continued on page 5)

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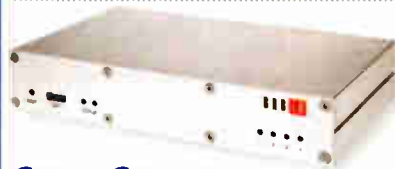
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AM Task Force Leader Is Encouraged

But issues like interference mitigation remain of concern for broadcasters

An important leader in efforts to “revitalize” AM radio in the United States is Ben Downs. You’ve read his opinions in our pages before.

I showed him the column I wrote last issue in which I welcomed industry discussion of AM improvement, predicted this would be a major topic at the spring NAB Show and took note of the special interest being shown by Commissioner Ajit Pai in AM. I asked for his perspectives, and I share them here.

Downs is a member of the NAB Radio Board and chairman of NAB’s AM Task Force. He is vice president and general manager of Bryan Broadcasting, a group of seven stations he owns with business partner and company President Bill Hicks.

Now he writes, “It is very true that the quest to revitalize AM has accelerated. It is nice to read that broadcasters who are defensive about their AMs are now willing to say, ‘Yes, it’s time to fix some things.’ The arguments that niche programs work just fine on AM are proof of the battle we’re facing.”

If revitalization is done right, he continued, AM radio will no longer be at the back of the format bus. “Music formats have migrated away from AM stations in the past decade and now we see the acceleration of spoken word formats moving to FM. Limiting AM to niche formats is not a pathway toward a thriving future.”

However, Downs agrees that progress is being made.

“Whether in the past the FCC was focused on the problem of Part 15 device interference, it recognizes it now. In a recent meeting with Audio Services leaders Peter Doyle and Susan Crawford, they absolutely understood the problem and were open to good ideas to fix it. I had the impression that they were eager to find a way to lift the senior radio band above the noise.”

system is as well. Many antenna matching units would need to be replaced.”

BURDEN OF MITIGATION

However, Downs’ biggest concern is a statutory requirement that AM stations resolve RF interference to telephones, TVs and audio systems when they change operating parameters. He noted that if an apartment complex has

Commissioner Pai’s interest – passion – for AM revitalization is the best news AM operators have heard in years.

– Ben Downs

Downs recalled a study conducted in Madrid and Mexico City in 2005 that found that AM transmitter power would have to be increased four to six times just to put the industry back to 1995 levels of signal above noise.

“That is a reason I am cautious about the idea to double AM power. According to the study, doubling power would (amazingly) still not be enough of an increase. Plus it might be beyond the ability of some AM operators to afford,” Downs wrote.

“Because of longstanding FCC rules, many transmitters are exactly sized to the licensed power. And the rest of the

been built around your tower, resolving interference complaints could be a lifetime job for an AM engineer.

“The long-term solutions, whether the migration to unused VHF spectrum or a conversion to all-digital, will take a lot of time to process. Without some form of intermediate relief, waiting 10 years for a long-term solution may be too long for some AM stations to remain viable.”

He hopes for nearer-term ideas. “The recent Tell City Waiver would allow AM stations to move a translator in a megahop as long as it was used to enhance an AM station. Likewise some — any

FROM THE EDITOR

Paul McLane



— relief for AM daytime or ‘almost (25 watt) daytime’ stations would add years of shelf life for the stations most at risk. Daytime stations suffer at the hand of a skywave protection plan that has little relevance to local community service. School closings local news, high school sports and other local station staples are not served from hundreds of miles away.”

Perhaps, he wrote, once translator/LPFM processing settles down, the FCC would consider opening a new one-per-station translator window for AM stations. “A boy can dream,” Downs said.

“Unfortunately, the long-term solutions require new receivers. The growth of AM HD Radio receivers in cars is making the digital option look feasible, but best I can tell, there are no home clock radios nor under cabinet radios capable of receiving digital AM or FM. The DTV transition handled this with a receiver mandate; an idea that makes regulators and lobbyists pale.”

Regardless, Downs concluded, “Commissioner Pai’s interest — passion — for AM revitalization is the best news AM operators have heard in years. As broadcasters we should encourage him at every turn. Only by having proof of our support will he be able to keep up the momentum. I’m really looking forward to hearing him at the NAB Show in Vegas. And I hope for a unified plan for AM revitalization before many more Vegas conventions have passed.”

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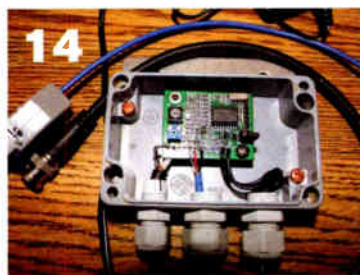
“Remote Season Planner” – Techniques and trends being used by radio organizations in bringing remote audio back to the studio.

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AM DIGITAL*(continued from page 3)*

system. Should the agency ever approve implementation of all-digital AM IBOC, it would first need data about the technology's performance. Proponents hope the information gleaned from tests would help to establish interference criteria and allocation rules.

Meanwhile, though much industry attention in recent years has focused on digital FM power levels and digital data, IBiquity officials recently told me they're making incremental improvements in the AM system, including working on better antenna solutions.

Going all-digital with AM is one of several AM technical improvements mentioned in a report from the NAB Technology Committee to the NAB board. The report has never been released publicly. When asked about that, NAB spokesman Dennis Wharton said ultimately it will be the board's decision, but "it's not envisioned to be released in its current form." Last fall I reported that several engineers told me the report would need to be revised for consumption by a non-technical audience.

Gage confirmed NAB Labs has several radio and television projects underway, including AM initiatives, as well as software development projects, but he declined to elaborate.

I've been asked why is NAB is being so "opaque" about the AM issue. To get stuff done is the short answer. A longer answer would be: To get stuff done in an environment where ideas and projects can be encouraged and honestly debated — and sometimes fail — in private, rather than in an arena in which ideas

are instantly criticized, causing people to stop contributing their thoughts. Or so several sources tell me.

Certainly, the possibility of someday allowing AMs to go all-digital is controversial; and NAB has radio group members both big and small who don't agree on any best course for the future of AM, let alone on all-digital AM technology. However shining a light on the process couldn't hurt and might even help the cause.

As to the industry's ability to understand the technical options: If the NAB

board can understand them, I suspect the radio industry can. By waiting several months to release details, NAB gives the impression that decisions are made by a select group and provides fuel for those who trash anything IBOC-related.

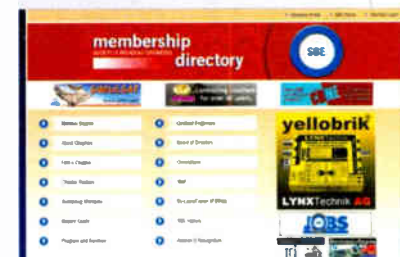
Whether the report is released soon may become moot, though, because Commission Ajit Pai and others are now bringing more of those options into the public's view on their own. It will be interesting to see what he and the panelists have to say on their session on AM initiatives at the upcoming NAB Show.

NEWSROUNDUP

EAS: The FCC told all stations to change passwords on their EAS gear immediately, after someone interfered with EAS encoders/decoders that were connected to the Internet, figured out the default password and inserted a false message that was transmitted by several stations. FEMA said its Integrated Public Alert and Warning System was not breached and it continues to support the FCC and other federal agencies looking into the matter. While most of the hacking incidents involved TV stations, we reported that one involved a radio group in Utah. Engineers for Bonneville KSL(AM/FM), Salt Lake City were able to head off the fake alert on the main signals but it was transmitted automatically on the station's HD2 channels.

PERFORMANCE RIGHTS: Texas Reps. Gene Green, a Democrat, and K. Michael Conaway, a Republican, reintroduced the Local Radio Freedom Act. If passed, the non-binding resolution would oppose any new fees, taxes or royalties for music played on local radio stations. The measure is aimed at blocking attempts to create a performance royalty for radio; no such measure had been introduced yet in this new session of Congress, as of late February.

SBE: For the first time, the Society of Broadcast Engineers has put its membership directory and buyer's guide online at www.sbe.org. Member and chapter searches can only be accessed by SBE members via password.

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RDS Displays Should Make Sense

Here are techniques that can be applied to all of your metadata delivery platforms

RADIODATA

BY ALAN JURISON

In a previous article in this series about RDS, I wrote that vendors and broadcasters should support RT+, a data stream you can add to your encoding that identifies the text in your RadioText. Receiver manufacturers then would have more incentive to include it in future models.

A theme of our articles is that we all should do more to ensure that the RDS information we display is clear and concise. Many of the topics below can be applied to all metadata delivery platforms, such as streaming audio on the Internet, as well as HD Radio Program Service Data (PSD), formerly known as Program Associated Data (PAD).

ALBUM TITLE DATA

Stations with RDS, HD Radio or Internet streaming that support song title and artist should supply the album title information (if applicable) as well. Our competitors — satellite radio, Internet pure-plays and even once-feared digital cable radio — have been doing this for years. Even many of our websites and streaming initiatives show album data. Some of the latest receiver designs display the album title in a prominent position on the screen.

However, most stations in the United

States do not transmit album title data. These radios display black space where the album title data should appear.

Many stations seek to be a central part of listeners' lives through music discovery or by airing familiar favorites;



Most receivers support upper- and lowercase letters. Use capitalization sparingly.

so we should provide listeners with as much information as possible about the songs we are playing. You'd be surprised how many people are interested in that information.

Supporting album title data on RDS is relatively easy. There are various approaches, but for most stations, the easiest is to populate album data in the music library of the on-air play-

back automation system. If you maintain your own music library, this might require long hours by your PD and the programming staff, but it is well worth the investment in time.

If your automation system vendor does not have a field for album title data, push the company to include it, or use another unused field in the database if available. Additionally, some automa-

tion system vendors make it difficult to export this data from their systems to your RDS encoder. Push them to resolve this too. The only way we are going to combat these problems is to make sure the vendors who supply the industry's products are responsive to our needs.

If you are implementing RT+ on your station, don't forget to include tags for album title once you start displaying it.

experience, having spent several years in the general counsel's office before becoming a commissioner in 2012.

PATENT CASE: Mission Abstract Data, now doing business as DigiMedia, has sued four more radio groups, claiming patent infringement. The new claims are virtually the same as ones filed previously against seven radio groups. MAD/DigiMedia claims that stations that have certain digital automation storage and playback systems are infringing on its patents. A court hearing on the patent case is slated for March 25.

GEAR AUCTION: Several hundred pieces of used NPR studio equipment are being auctioned at *Rasmus.com*. The online auction closes April 11. It will help clear out items not moving to the network's new headquarters building in Washington. Any station or individual may participate in the auction, though NPR member stations get 35 percent bidding credits. Most of the equipment is 15 years old, still in daily use, remains serviceable and has been professionally maintained, it said. Equipment ranges from patchbays to distribution amps, to compressor/limiters, consoles, and even studio doors and studio cabinetry. NPR's move is on-track for April 1.

FORMATTING & CAPS

In the early days of RDS, it was the general practice to capitalize everything, because some radios did not support lowercase characters. I have never actually seen such a radio. This recommendation is no longer applicable. Most receivers support both upper- or lowercase characters. Even in those with displays that show everything in all caps, the capitalization is handled by the unit.

TODAY, I LOOK AT STATIONS WITH ALL CAPITAL LETTERS IN THEIR RDS DATA AND I FEEL LIKE THEY ARE YELLING AT ME. I think it looks bad, and your listeners probably agree.

That is not to say that I totally disapprove of capitalizing. Use it sparingly. You might want to emphasize words or show excitement such as "Call NOW and WIN!") Your opinion may vary.

SONG FIELD LENGTHS

Another annoyance is the prevalence of music libraries with truncated, incomplete or inaccurate title/artist/album data. Your PDs and their staffs need to groom the music libraries to make sure the data is accurate. Your station's credibility is on the line.

Also, some automation system vendors still have legacy designs with short data fields for title/artist/album. If this is applicable in your case, make sure you let your automation system vendor know that this needs to be improved.

I was pleased to see that some newer releases of a major automation system now allow up to 60 characters or more in each of these fields. This is a great improvement from past designs and I recommend that all automation system vendors improve the amount of characters allowed in these fields. I have seen them in the 24–36 range; often these will cause truncation.

Shorter lengths were generally acceptable when only the on-air DJ saw the data, but this information is now used and exported to the eyes of your listeners on external sources like RDS, HD PAD, Internet streaming, website Now Playing and other endeavors. It is important we make it look as good and as accurate as possible.

Wish to learn more about the data in these fields? The National Radio Systems Committee issued guidance in the report "NRSC-R300: Program Associated Data (PAD) Field Length Study," in November 2011. Read a summary of this at *radioworld.com/links*.

'NOW PLAYING ... BY ... ON'

Some stations add the phrase "Now Playing," then insert the title of the song, then "by" followed by the artist name, then "on" and the station name. I discourage this practice; so does the NRSC-R300

(continued on page 8)



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We are pretty sure this is a first – an open-air moving studio broadcast on two wheels (well, six, technically).

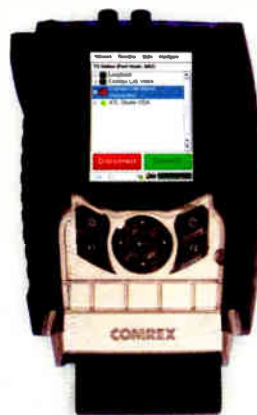


All audio was fed to a Comrex ACCESS Portable, complete with optional mixer, which Dan used to mix the live



Dan Jackson, engineer for 92.9 FM in Perth, Australia was faced with a unique challenge. Breakfast hosts Paul Hogan and Lisa Fernandez would be cycling for hours in strong winds and pouring rain as part of the 92.9 Kids Appeal for Telethon.

The unique solution was to equip Dan's bike as a mobile production facility. The talent wore wireless mics AND in-the-ear monitors which communicated with receivers and transmitters in a rack bag on Dan's bike.



on-air feed as the trio traversed the winding roads of Perth. How did it all work out? Absolutely flawlessly – the show went on without as much as a speed bump!

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RDS DISPLAYS

(continued from page 6)

document, and so do many others.

First, "Now Playing" is redundant. The listener is smart enough to determine that the station is displaying information about a song; and your station should not display that information when the song is *not* playing.

The use of "by" is unnecessary and can lead to grammatical errors. Say, for example, you have a song where the artist is a band name such as "The Beatles." Many programmers omit "The" for reasons of alphabetizing and organization; but if your station is using "by," the resulting display will read "Now Playing Revolution by Beatles on Station."

Further, in both the Program Service (PS) and RadioText (RT) fields, we are working with a limited number of characters. In the RT field, we have 64 characters. By adding "Now Playing by on," we are wasting 22 characters or over a third of the space for each song. That is valuable real estate better used for the song's album title name.

Also, remember that there are many types of receivers on the marketplace, and some of them have limited screen space. The receiver in Fig. 2 is an example. Most of the screen is showing "Now Playing" instead of information regard-

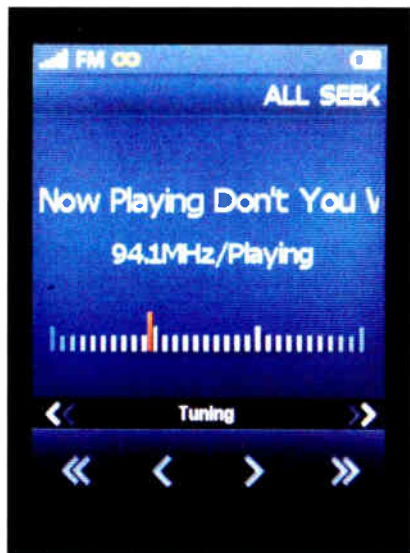


Photo by Alan Jurison

Some receivers have limited displays, so it is best to keep your RDS text concise and avoid unnecessary phrases such as 'Now Playing.'

ing the station or song. The receiver displays the first 22 characters well, and then periodically scrolls the rest of the information in the RT. Some designs show even fewer.

Using an example from NRSC-R300, consider a dot-matrix display of 20 characters wide. This display can handle 73 percent of Artist fields in the sample database. However, if "Now Playing" is

prefixed to the transmitted text, the display can handle only 14 percent of Artist fields before scrolling.

Likewise, in the PS field, since we are working with only eight characters at a time, this adds more characters between the station name and song data. NRSC-R300 addresses this in detail and demonstrates through statistics how scarce the 64-characters we have to work with in RDS can be.

My recommendation is to remove these unnecessary phrases from your RDS systems. Your opinions may vary.

DATA, SONG TIMING

Stations that are running delays, whether for HD Radio and/or for profanity, should make adjustments in their RDS display delays. Some hardware and software products on the market have this ability. Research this and spend some time "fine-tuning" it in front of radio receivers.

If you ignore the delay adjustment, it is possible that a song's data could show up before the song is on the air! If your station starts to play another song, the new song's data can be displayed for a period of time while the old song is still playing, which is also an issue.

For stations running in real-time with no delay, this alignment process does not apply; the data is sent to the RDS

GET THE MOST OUT OF RDS

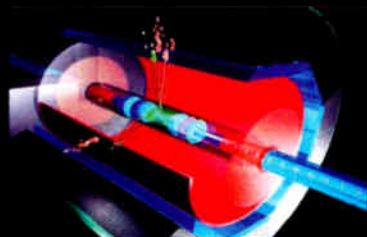
This is one of a series of occasional articles to help you get the most out of RDS. Read them all at: radioworld.com/RDS.

encoder at the same time the song is changed. Note, as discussed earlier (see "RDS: Optimize RadioText Send Rate," radioworld.com/RDS), there are transmission delays associated with the delivery of RadioText, and those can be adjusted by changing the RT send rate or group sequence of your encoder.

If you employ a delay of at least four or five seconds on the analog FM signal, and if you use the suggested optimized RT send rates, you can couple the new RT tightly to when the song immediately starts airing.

Next time we'll discuss additional common RDS problems and remedies.

Alan Jurison is a senior operations engineer for Clear Channel Media + Entertainment's Engineering and Systems Integration Group. He holds several SBE certifications including CSRE, CBNE, AMD, and DRB. His opinions are not necessarily those of Clear Channel or Radio World.



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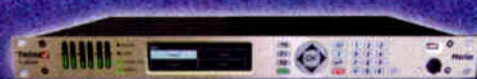
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TRANSLATORS

(continued from page 1)

Channel holds 30 translator applications, also mostly in small and rural markets.

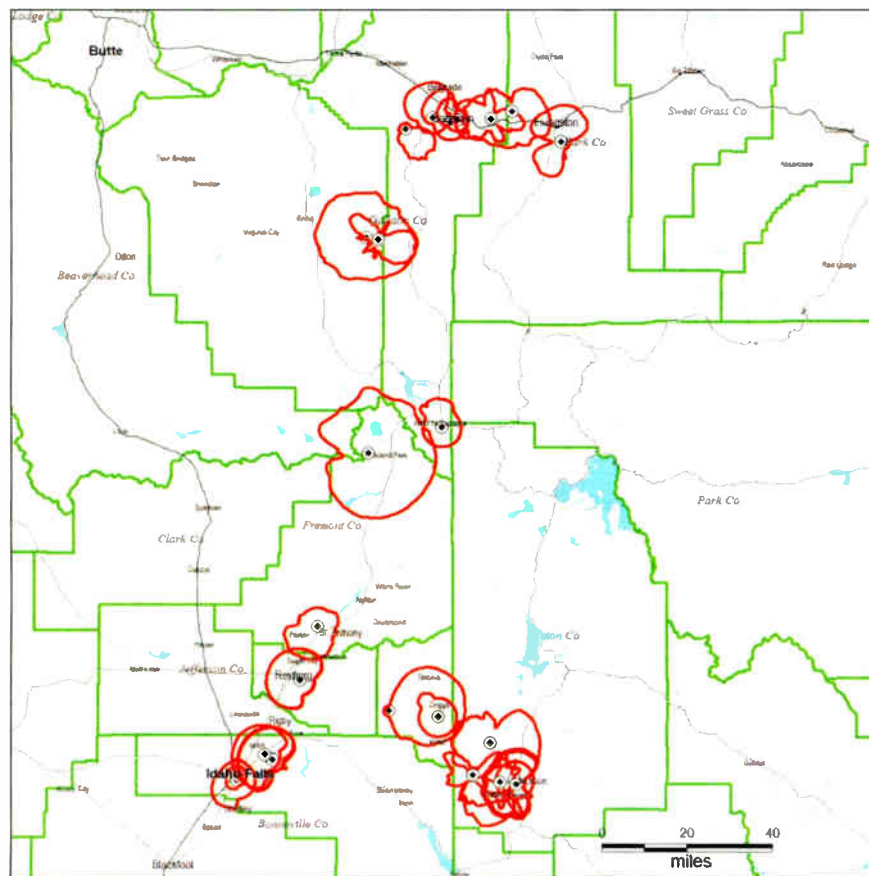
Some organizations with big translator plans are feeling the impact of the FCC actions. Radio Assist Ministry had 729 applications dismissed while RAM's sister organization Edgewater Broadcasting had 565 dismissals, according to LPFM advocate REC Networks. Each has 70 apps left pend-

ing as of late February.

RW's attempts to reach officials from those two companies for comment were unsuccessful.

TRANSLATOR CAPS

At the heart of the translator proceedings has been the large number of unprocessed applications left over from 2003. The commission said it received 13,377 translator applications at the time, and subsequently issued 3,476 authorizations before it issued a freeze.



Predicted coverage of pending FM translator applications in an area of Idaho.
Image provided by du Treil, Lundin & Rackley Inc.

THE LONG ROAD OF THE TRANSLATOR CAPS

Recent FCC action settled the long-running issue of what to do with thousands of pending FM translator applications dating to a translator window that opened 10 years ago.

The commission in December finalized a national cap of 70 translator applications per entity, provided that no more than 50 of those are in the top 150 radio markets. It also will allow companies to only pursue no more than three applications in a given market.

In earlier proposed rulemakings, the FCC outlined a cap of translators at 10 pending applications per entity, calling this an effort to safeguard the integrity of its filing window process and preserve spectrum for LPFMs. That limit was never adopted, and subsequent rulemaking proposals followed. The agency eventually bumped the cap number to 50 before finally settling on the caps described above.

A few broadcast entities held large numbers of applications from the 2003 window, including the commonly-owned Radio Assist Ministry and Edgewater Broadcasting, with a total of 4,219 applications, according to agency records. Those entities combined received 1,046 grants before the processing freeze.

The initial translator window produced 13,377 applications; the FCC subsequently issued 3,476 authorizations before it froze the process. By late 2012, the total number of remaining outstanding applications had declined to around 6,000.

"There was some natural attrition I think," said Womble Carlyle attorney John Garziglia. "Various applicants affirmatively dismissed applications because they no longer fit into their plans or conflicted with others they had filed. Some grew tired of waiting and developed other plans. It's also possible some of the mass filers dumped scores of applications at once. That would account for a substantial number."

It was from that remaining 6,000 that the FCC began dismissing in February.

Since that time, the number of pending applications fell for various reasons, but still stood around 6,000 as of the end of last year.

The FCC has said it hopes to complete its translator winnowing process before the LPFM filing window this fall.

"My guess is, in the end, maybe around 1,000 construction permits will be issued," said Bob du Treil Jr., president of engineering consultancy du Treil Lundin & Rackley Inc.

Demand for FM translators, which rebroadcast signals of primary AM or FM stations on different frequencies, has increased since the commission in 2009 began allowing some AMs to use

ing to pursue more than one application in a top 150 market now must show that any additional applications will not preclude LPFM opportunities the FCC has identified, said David Oxenford of law firm Wilkinson Barker Knauer.

"This is a disappointment for some broadcasters," said Oxenford. "There has always been concern that some of these caps have been somewhat arbitrary. The FCC has made it difficult to take advantage of any opportunities created by the eventual increases they granted in the caps." He represents Educational Media Foundation, which had 297 applications prior to the dismissals and is now down to 70.

The potential for enhanced service over FM translators has been harmed by the FCC's translator processing delays and caps, in favor of a nascent promise of community-based programming from mostly hobby broadcasters that would like to play radio with an LPFM station.

— John Garziglia, Womble Carlyle

them to rebroadcast programming as a means to mitigate AM coverage problems. The power level may not be great — maximum effective radiated power for any FM translator is 250 watts, according to the FCC — but translators can provide AMs with access to valuable FM spectrum as well as enhanced nighttime presence.

"Demand [for translators] will continue to be high because of the greater interest and need for translators for both AM and FM facilities," du Treil said.

However, a translator hopeful seek-

The limits will make it more difficult for commercial broadcasters to find translator opportunities, he predicted.

"Some of the companies that filed the most applications have also been some of the most willing to sell translator licenses once they got them. By placing limits on the big filers, there won't be as many channels available now."

Oxenford, who like du Treil expects around 1,000 translator CPs to be issued, believes years will pass before another translator filing window opens.

'NOT OPTIMISTIC'

Some analysts view the translator limits as a defeat for broadcasters "in the sense that one of the most immediate needs for broadcasters and the radio listening public is to revitalize the radio service that is now provided by hundreds of AM stations across the United States," said Womble Carlyle attorney John Garziglia.

"Just about any AM broadcaster would welcome the opportunity to provide service to its listening audience by a re-broadcast on an FM translator."

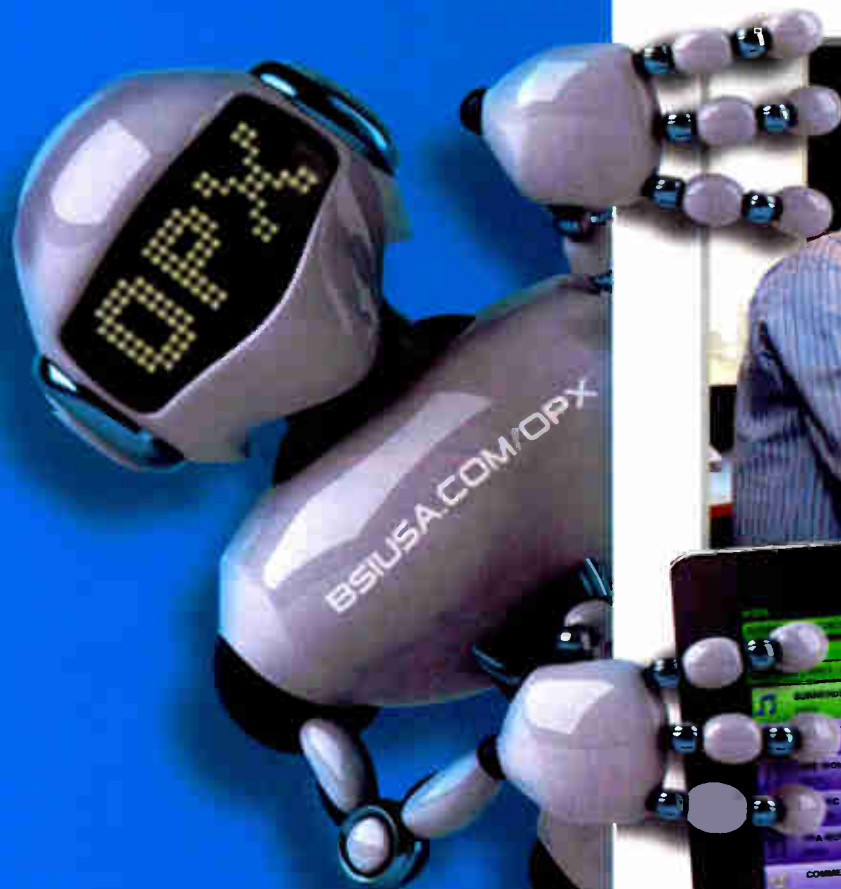
Garziglia said that while most broadcasters laud the community service goals stated by LPFM proponents, he feels the low-power debate largely ignored the superb community programming already provided by a majority of stations, many of them AMs.

"The potential for enhanced service over FM translators has been harmed by

(continued on page 12)

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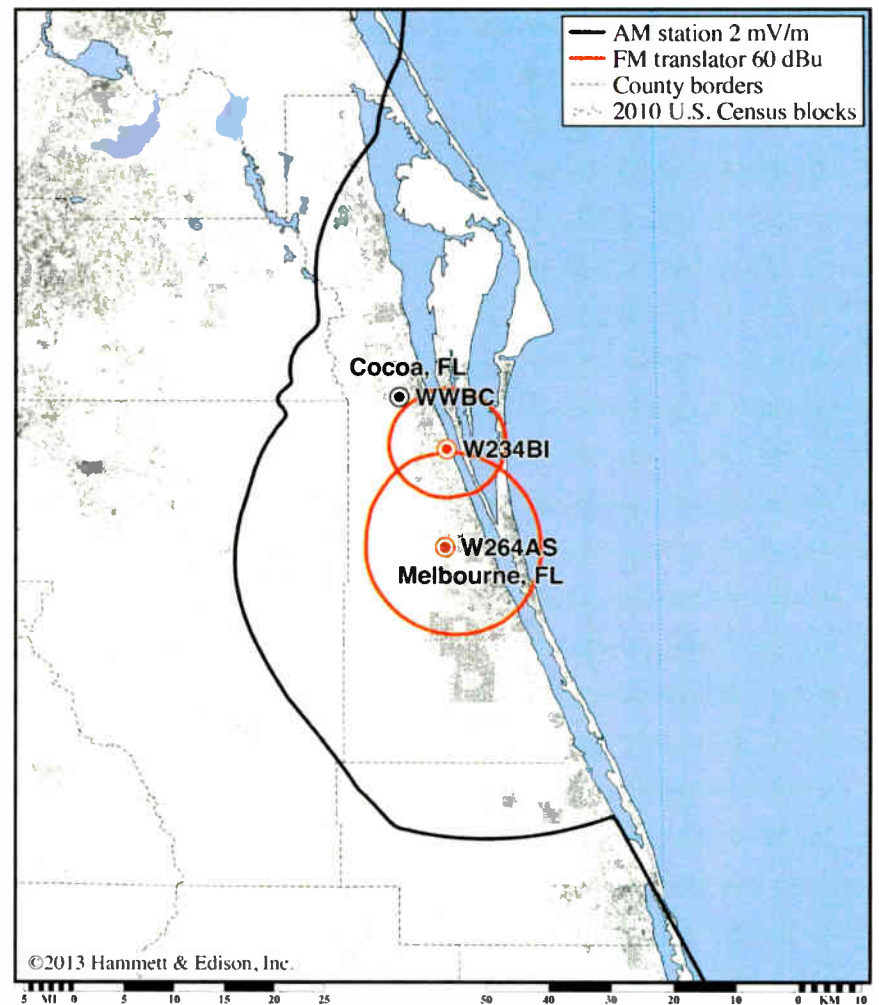
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FM translators associated with AM daytimers have no operating hour restrictions; a translator may continue to broadcast programming even if its 'source,' the AM station, goes off the air at night. This example, prepared by Hammett & Edison using FCC data, suggests that WWBC(AM) in Cocoa, Fla., 50 kW by day, can serve almost half of its daytime population 24/7 with the combined overlapping contours of its two translators, which have ERPs of 125 and 250 watts.

TRANSLATORS

(continued from page 10)

the FCC's translator processing delays and caps, in favor of a nascent promise of community-based programming from mostly hobby broadcasters that would like to play radio with an LPFM station."

He said it's impossible to forecast the number of translators that will be granted, given such considerations as the new caps, LPFM preclusion showings and long-form application and settlement window processes.

Another legal observer, Fletcher Heald & Hildreth attorney Harry Cole, doubts that many applications in the top 150 markets will survive to be granted to licensees. "It's possible that the engineers will prove my gut wrong, but I'm not optimistic."

However, some LPFM observers applauded what they see as the FCC's recent decisiveness in handling the translator backlog as expediently as possible.

"It has been speculated for some time by many LPFM applicants that there was a power grab underway, spearhead-

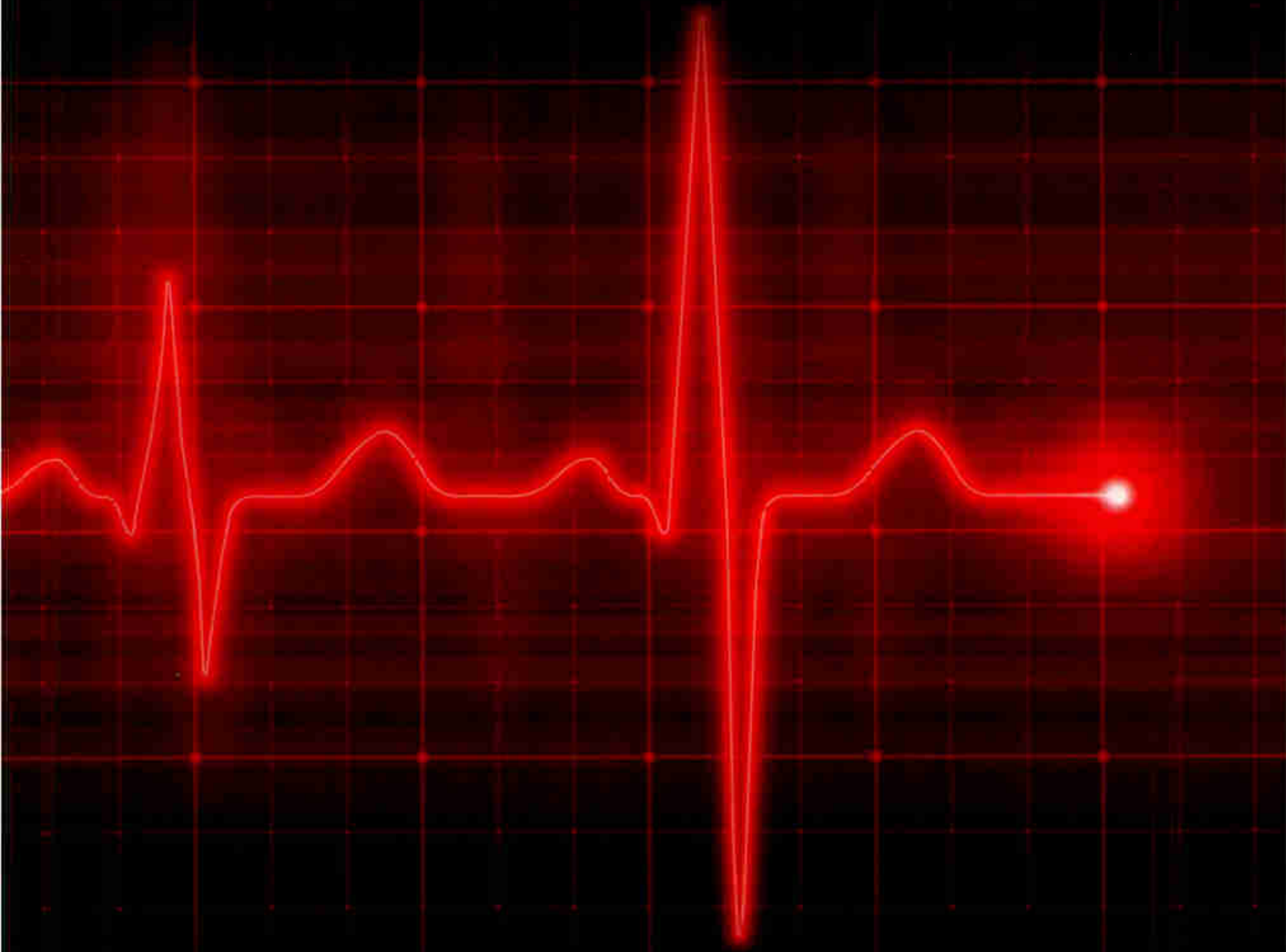
ed by some of the full-power stations," said Eric Hoppe, owner of Progressive Concepts, a broadcast equipment supplier that serves the FM and LPFM market.

"It appeared that the full-power stations had filed for multiple translator applications in an attempt to squeeze out what otherwise would be available frequencies for the LPFM market." Hoppe anticipates the recent translator action will help usher in the long-awaited LPFM filing window this fall.

"Clearly the FCC's move to establish caps for the number of translator applications for a single applicant within a given market will go a long way to solving this problem" for the future of low-power FM, he said.

The FCC first authorized FM translators in 1970. Prior to the 2003 filing window, it had licensed 3,818 FM translators and boosters nationwide, according to the commission's data. As of the end of 2012, there were 6,075. Its database does not distinguish between translators and boosters, which also rebroadcast but are on the same frequency as the source FM station.

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MARKET PLACE



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Info: www.audio-technica.com

AUDIO NUMBER NINE: Omnia Audio released what it described as the first significant software update for the Omnia.9 FM/HD/Streaming processor since its rollout in late 2011.

"The new software contains several significant performance features, including a new Dry Voice Detection circuit that substantially reduces audible distortion on bare voices when more aggressive processing is employed to achieve greater loudness," the company stated.

"Dedicated multiband controls are provided to adjust dry voice processing separately from music, which nearly eliminates the need to compromise voice quality in exchange for competitive overall loudness. A selectable phase rotator has also been added to restore symmetry to (and remove distortion from) voice, a valuable enhancement for news, sports and talk stations."

The upgrade also introduces an RF Bandwidth Controller, which allows users to manage the RF footprint with more precision, to help control multipath distortion, plus other improvements.

Info and download: <http://omniaaudio.com/software/9>

WORKBENCH

(continued from page 14)

which can be a good two feet or more away from the performer.

Since the level meter associated with the VoIP software will show deflection no matter which direction the talent speaks, it's an easy thing to miss. If the connection was not tested anywhere beyond the cue speaker back in the studio, that first on-air hit over the big monitors comes as quite the disappointment.

To be sure which microphone is active, tap the standalone mic with a pencil and observe the meter. Then tap the upper edge of the laptop's lid. The one with the strongest deflection is the active microphone. Change it in the software's Setup

or Options menu if necessary.

It will help too if the board-op back at the studio is listening to the test and can tell you immediately which is the stronger of the two.

A simple tip but one that is sure to make VoIP remotes sound better. Alan Peterson, production director for the Radio America Network in Arlington, Va., can be reached at apeterson@radioamerica.org.

Contribute to Workbench. You'll help your fellow engineers and qualify for SBE recertification credit. Send tips to johnpbisset@gmail.com. Fax to (603) 472-4944.

Author John Bisset has spent 43 years in the broadcasting industry and is still learning. He is SBE certified and is a past recipient of the SBE's Educator of the Year Award.

STAND-UP GUYS: Full Compass added Triad-Orbit Advanced Microphone Stand Systems to its product line. The dealer highlights the line's innovative adjustment mechanisms and range of configurations.

Tripod mic stands have legs that can be adjusted to five positions using a unique ratcheting mechanism; the angle of the stand can be adjusted at the base up to 65 degrees of pitch. Booms, available with one or two arms, have a stainless steel ball swivel mechanism that gives a particularly broad degree range of motion. Specialized couplers and adapters complete the line.

Info: fullcompass.com



CROWDCASTING: LDR is emphasizing the benefits of its technology to allow "crowdcasting," and said Cox Media station WSUN(FM) in Tampa became the first rock music station in the country to let its listeners "take total charge" through its service.

LDR, based in Cleveland, launched the interactive programming concept about three years ago, and says the system is used on about 160 radio stations in various countries.

In Tampa, "The 'LDR.Takeover' platform used by 97X allows listeners to vote on each song that plays on 97X throughout the day by voting on the station's website and through a new Apple and Android mobile app that LDR custom-developed for the station," it stated.

The station format allows listeners to choose music from among 1,800 songs including deeper cuts and less familiar artists. An "Open Mic" feature lets listeners record and upload song introductions. Listeners are notified by SMS, email and Twitter alerts when favorite songs are about to play, and can share votes on social platforms.

Early popular listener picks were Foo Fighters, Muse, Fun, The Lumineers, Mumford and Sons and Imagine Dragons.

Info: www.LDRinteractive.com

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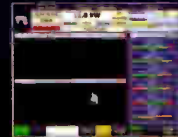
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'Our Sales Story Is Changing Dramatically'

Farber is a visible radio proponent, a year after taking RAB's top job

MANAGEMENT PREVIEW

BY RANDY J. STINE

Radio sales professionals seem to have more opportunities than ever to serve a client's advertising needs. From terrestrial signals and in-dash data displays to podcasts and online streams, new revenue opportunities are making salespeople adapt.

Of course, that also means more monthly goals to hit.

Erica Farber, president and CEO of the Radio Advertising Bureau, sees this digital era as the start of a new cycle in radio sales. She'll be a visible presence at the upcoming NAB Show and the neighboring RAIN Summit West, dedicated to the topic of Internet radio.

Farber's professional career is stacked with radio experience in sales, management and publishing. She now has been at the helm of the RAB for approximately a year, and says her first 12 months have buoyed her enthusiasm for radio and how it can help advertisers.

We should be flattered that so many of our competitors are also calling themselves radio.

— Erica Farber

"Advertisers and agencies still see radio as a very strong medium. From a listening standpoint, we know that over 92 percent of all Americans are listening to radio during the week. Advertisers continue to use radio as a means to reach consumers," she said.

Interestingly, with all of the choices available to advertisers, radio still receives about the same percentage of advertising budgets as it always has, Farber said.

"But now with radio available on so many multiple platforms, we provide an even better solution to advertisers to reach customers. Our challenge as radio professionals is getting our arms around the measurability of all the listening going on across different devices," she said.

"At the same time, our sales story is changing dramatically. No longer do we go into clients to speak about individual radio stations, we now bring an integrated marketing approach to an advertiser."

GROWTH OF MOBILE

Broadcasters must still push forward to get their product on as many devices as possible, Farber said, then figure out how to monetize the variety of products.

"The strategies to do that seem to vary greatly from company to company. The focus for most is still on the broadcast signal revenue, and that is totally under-

standable. But at the same time, we are seeing stations develop a strategy for social, online and develop strategies for in car.

"There are more and more apps available, from iHeartRadio to TuneIn. There isn't one single strategy.

It seems each company is looking at their audience and looking for ways to respond to fit that audience."

Mobile marketing — advertising delivered to mobile devices held in the hand — is a fairly new platform that is available to broadcasters.

"We need to maximize that platform. The technology is allowing radio to do so much more with content. Whether it is contesting, video or couponing, it all helps radio get that much closer to its consumers."

Despite the addition of multiple platforms, the frustration of most radio sellers remains the same: simply getting in the door.

"People are busy and people are time-starved, so getting that face-to-face time with the client is difficult sometimes, but it is critical, of course, to get that appointment. The other issue is coming up with actionable marketing plans and concepts that will help that advertiser move the needle," she said.

"Understanding what it is the customer wants to do and then bringing them some specific ideas to help them is the challenge. Businesses are bombarded today with so many different media options. You have to be smart, efficient and timely."

WE ARE RADIO

Farber reminds broadcasters that "radio is radio," and they should be consistent when referring to their product.

"We should refer to the product how listeners refer to the product. We don't need to deem it 'terrestrial' radio. In fact, it was the satellite radio creators that started calling us terrestrial, to pit them against us; and then some within broadcasting adopted that term.

"We should be proud to call ourselves local radio," Farber said. "And we should be flattered that so many of our competitors are also calling themselves radio."

RAB's revenue forecast for 2013 is for overall growth in U.S. commercial radio revenue of just under 1 percent, Farber said. "I would like to see consistency develop. We are starting to see some digital growth. We'd like to see that needle move even higher."

(Subsequent to this interview, RAB reported that in 2012, overall revenue grew 1 percent, including 8 percent growth in digital revenue from online, streaming and HD Radio. Radio's fourth quarter saw a 4 percent uptick overall.)

Audience measurement of radio consumption, across all platforms, is going to be crucial to radio's future growth, she said.

"We must be able to measure the consumption of our

products on all levels in all situations, in order to truly present a solution to an advertiser.

Farber is a member of the board of directors at Arbitron. (She referred questions about the rating company's pending sale to Nielsen to Arbitron officials.)

Farber's focus in her first year at RAB has been on identifying the group's "touch points" with its membership and invigorating the industry. She sends email updates called RAB@work; and a re-launch of *rab.com* will coincide with NAB 2013, she said.

"We have a new communications plan. We are enhancing training products and services and increasing the number of touch points, including refocusing on the Radio Show this fall." The sales organization, with approximately 7,000 members, will continue to offer a variety of radio sales workshops and webinars.

Farber believes radio selling remains a very strong career option for young professionals.

"This is the best time to get into radio selling. Radio still has a connection in the local market place. We need to make sure it remains a satisfying career, with stability being one of the keys. We can com-

pete against technology companies and startups for good sales people, but we need to compensate young people coming in other fields," Farber said.

"Radio needs to find people who are young, energized and understand technology."



Erica Farber. 'Our challenge as radio professionals is getting our arms around the measurability of all the listening going on across different devices.'

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World Radio History

KNOM: Making It the Hard Way

Nome broadcaster will be honored with NAB Crystal Heritage Award

MANAGEMENT PREVIEW

BY KEN DEUTSCH

As cartoonist Bob Thaves famously said about Fred Astaire, "Sure he was great, but don't forget Ginger Rogers did everything he did, but backwards and in high heels."

In a similar manner, one might compare most radio stations to KNOM, which simulcasts on AM and FM in Nome, Alaska. This is a station that has had to achieve success the hard way.

"I live two blocks from the station," said General Manager Ric Schmidt. "I

General Manager
Ric Schmidt



News Director
Laureli Kinneen



tion in the United States. KNOM has a slogan that is repeated on the air every hour: "Yours for Western Alaska."

That region comprises more than 100,000 square miles including dozens of small villages, some of which have no running water or electricity. The nearest large city is 500 miles away. Listeners use www.knom.org when the AM and FM signals can't reach them.

"The bush Alaska is like a Third World country," said Schmidt. "Travel is often restricted. There are no roads between some villages. My father came up here years ago and said that you can understand this region [is] on the periphery, but you have to physically be

walked about a third of the distance to work one day. I tried to take a breath, and it hurt! The wind chill was 78 below. I jammed my face into my coat and eventually caught my breath, because I didn't want to die. For every step that everyone else has to take in the 'Lower 48,' we have to take 17." (To see these weather conditions, type "Nome webcam" into a search engine.)

The climate is not the only challenge in running a station on the western edge of Alaska.

"An avocado here costs \$5.46," he said. "Fuel prices are a couple dollars more a gallon than in the lower 48. Building materials are very high and even getting them here costs a lot. You have to bring in everything by plane or barge."

PEOPLE WHO NEED PEOPLE

KNOM in April will receive the NAB Crystal Heritage Award, which honors stations that have won five Crystal Radio Awards for community service. The oldest Catholic radio sta-

here to know what it's like."

Located on the shore of the Bering Sea, Nome is home to the Inupiat, Yup'ik, Aleut and Athabascan peoples.

"It's quite a cross-section," said Schmidt. "Our message is that we value all cultures."

ARE YOU BEING SERVED?

KNOM is a non-profit community station supported financially by about 10,000 people, only some of whom live in Nome.

The AM went on the air July 14, 1971, playing primarily country and Christian music; KNOM added FM in 1993. Over time it has broadened its offerings to include music from the 1930s to today, Christian programming, native northern fare and talk shows.

Another important component is information: community announcements, news, weather, fishing reports and a special kind of local sports. The news director, Laureli Kinneen, covers the Iditarod dog sled race from Anchorage to Nome.

"We try to be an ever-present friend," said Schmidt, who joined in 1985 as a volunteer and became general manager in 2005. "I could put you on a plane and send you to a village up here. When you get off the plane, tell them you're with KNOM, and you'd be welcomed like you were family. Which says as much about the great citizens of western Alaska as it does about KNOM."

What does it take to meet the com-

(continued on page 22)

knom
RADIO MISSION

96.1 • 780 • Yours for Western Alaska



This image of KNOM's building, modified in Photoshop, shows a planned addition. The station hopes to raise \$1 million for the 'Tom and Florence Busch Digital Studios' and was nearing the halfway point in February. Tom Busch helped found KNOM. His mentor and Alaska broadcast pioneer Augie Hiebert also was a critical figure in the station's planning.



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Bob Eburg

KNOM

(continued from page 20)

munity needs of such a huge geographical area, with multiple ethnic groups and a rough climate?

"We do it with an annual budget of about \$1.5 million. We have seven paid staffers, five full-time volunteers who are mostly kids out of college donating a year or two, and eight part-time community volunteers," said Schmidt.

KNOM has a history of volunteerism. According to its website, much of its income in the early years came from registered nurses at the Nome hospital, who lived as volunteers and donated their entire income to the radio mission. The last of those nurses left in 1994.

Today, Schmidt says, "Part of how we serve the community is



Courtesy NAB

From left: Daynee Rosales, Margaret DeMaioribus, Joshua Cunningham, Lucas Kepel and Eva DeLappe.



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our talk shows, where the people actually get to talk and no one cuts them off. There are a lot of deep-seated feelings here about how the white culture has sliced into the native culture. We have brought in experts that help people who want to shake the addictions of cigarettes and booze. We also work to help listeners improve their diet by eating healthier traditional foods."

Radio can play an important part in the lives of listeners, and notably so in a state with one of the highest suicide rates.

"We work overtime to make people feel they are cared for, and our listeners know there are friends on the other end of the radio," said Schmidt. "Of course, we don't see most of the people we serve, and they usually don't see us, but we are connected. And I think we end up getting back so much more than we put out."

I could put you on a plane and send you to a village up here. When you get off the plane, tell them you're with KNOM, and you'd be welcomed like you were family.

— Ric Schmidt

It is this kind of dedication that earned KNOM the Crystal Heritage Award, which only three other stations have won. The presentation will occur April 9 in Las Vegas during the NAB Show. "If you split up this award among all the people who deserve it, I'd get one molecule," said Schmidt.

KNOM leaves its mark on people. For instance, John Kreilkamp was a volunteer at KNOM in 1978.

"I joined the Jesuit Volunteer Corp and asked to be sent someplace far off and romantic," he said. "The Jesuits always did have a great sense of humor. But my time at the station stamped an indelible impression on my life. Today, many of those who served with me for \$10 a week are still some of my closest friends." (Both Schmidt and Kreilkamp met their future wives in Nome while volunteering for KNOM. Love is in the frigid air.)

Another fan of KNOM is Amber Miller, administrative assistant at the Nome Visitors Center.

"KNOM is inviting to everyone," she said. "They have a breakfast every

A few excerpts from the KNOM timeline, found at www.knom.org:

1966 — Volunteers begin soliciting for the radio mission. The first volunteer, a worker at a local "greasy spoon," contributes income to purchase broadcast equipment.

1971 — Bishop Robert Whelan, shown, pushes the "play" button for the station's first program.



1972 — The station suffers 69 power outages in the first year of operation; one lasts 28 hours.

1973 — KNOM covers the first Iditarod Sled-Dog Race, in part using 1950s-era taxicab radios. Also covered: One man's attempt to cross the Bering Strait in a bathtub.

1989 — Nome hits an all-time low temperature of -54 degrees F. "The volunteers discover that if you toss a cup of boiling water into the air when the temperature is below -50, the water disappears into a cloud of vapor."

1996 — Because of the eruption of Mount Pavlof, a volcano 600 miles south, KNOM broadcasts volcanic ash advisories, in addition to blizzard warnings.

2004 — A storm raises ocean level by 10 feet. Nome loses electricity as water floods homes and "tosses immense logs and rocks the size of watermelons across Front Street." KNOM serves the community with standby diesel generators. Another storm in 2005 rips siding off the west studio wall.

2006 — A radio hobbyist in Oregon is the first person in KNOM's 35-year history to hear the station from the Lower 48.

2008 — Local police ask KNOM to air a request that residents avoid the north side of the city's hospital, where a moose and her calf have taken up residence.

2010 — Founder Tom Busch dies. The station formalizes plans to separate itself from the Catholic Diocese of Fairbanks and form KNOM Radio Mission Inc., a non-profit corporation established to continue its broadcast traditions; the transfer was completed last year.

Read more and see historic KNOM photos at www.knom.org.

week for the community, and they house volunteers there in a big building where people can go. KNOM says on the air, "If you have questions, or you want to hang out with us, you're always welcome."

The station had been licensed to the Catholic Diocese of Fairbanks, which in 2008 filed for reorganization in the wake of numerous lawsuits accusing priests and volunteers of sexual abuse. In 2010, KNOM formalized plans to separate itself from the diocese as a result of that bankruptcy, to help guarantee the station's future. It formed KNOM



Courtesy of KNOM

Some Local Nome flavor.

Radio Mission Inc., and the transfer was completed last year.

Schmidt summarized the station's persistence: "Having survived repeated power outages, gale force winds, restricted travel due to volcanic dust, a severed AM tower guy wire, blinding blizzards, ice storms, floods and high seas, lightning strikes, a firebombing, the diocesan sex abuse scandal, polar bears and musk ox roaming the AM transmitter site and all kinds of communications failures, KNOM remains committed to serve the people of western Alaska."

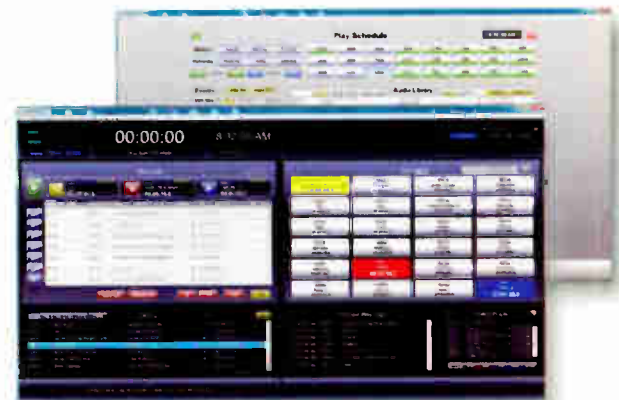
Ken Deutsch has written for Radio World since 1985 and can be reached at ken@kenddeutsch.com.

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pictured: Wheatstone LX-24



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WHEATNET-IP: THE INTELLIGENT NETWORK



John Tesh on Radio With Distinction

Entertainer will deliver the keynote at the NAB Show Radio Luncheon

MANAGEMENT PREVIEW

BY ALEXIS HAUKE

Whether you know John Tesh for the music (more than 7 million albums sold), the journalism career (six Emmys and an AP award) or just his stomach-tickling appearances on Conan O'Brien, in which he lampoons himself (in satirical segments like "When Teshs Attack" and "Tesh Secrets"), one thing is certain about this year's NAB Show Radio Luncheon keynote speaker: The towering blond pianist and media mogul knows how radio works.

Tesh recalls coming of age in the business of small-market news. At a job right after graduating college (in 1974), he says, "You had to go out and you had to record interviews with people on a recorder that was the size of a backpack." He told RW he remembers using a compressor to make the sound louder — there was a physicality to editing back then.

These experiences later influenced the curriculum of a course he taught at the New School in New York, about how to become "unfireable." One of the lessons: Immerse yourself in every aspect of the profession, if you want to be a leader in that field.

"I know how to do everybody's job, at least technically, at the office. I'm not the best at it, but I know how the technology interfaces. It's an important lesson for radio now. As the business is



John Tesh said millennials 'are sick and tired of being screamed at.'

changing, you really need to know about all the social media stuff. You should know how to go out on sales calls."

FORMER ENGINEER

John Tesh's radio show "Intelligence for Your Life" (he wrote a New York Times bestseller by the same title) reaches a reported 8.2 million listeners per week in the United States, Canada and the U.K., with advice on topics like health and wellness, relationships and finances.

Starting as a physics and chemistry major at North Carolina State when he was 18, Tesh said he "got bit by the radio bug" by way of the campus radio station, where he worked a job as an assistant engineer. (Fun to imagine him today as a director of engineering.)

**It's the simplicity
of turning your radio on
and listening to a host
with great music.**

— John Tesh

Eventually he switched his major to television and radio and landed a weekend gig at WKIX(FM) in Raleigh, "about the time that Rick Dees was there." Eager to work his way up, Tesh made a demo for the station, but was

told to gain more experience and come back later.

So he went back and made another demo, only this time, "I pretended to be all the announcers," he said. (While recounting how he recorded a fake news show in which he played the correspondents and DJs and everyone on-air, Tesh shifts his voice and recreates the different personas he invented.)

"I made another real tape and dropped it off at their doorstep at like 2 in the morning, and about two days later I got a phone call and it was just laughter on the other end: 'How did you do this? Did you do this? If you want this job bad enough, you can work weekends.'"

While that kind of story may seem like a relic of the good old days, Tesh says that kind of persistence and creative thinking remains an important factor in making oneself stand out from so much white noise in radio, as another young man recently did at his own station.

"Nobody writes handwritten notes anymore," Tesh said. "Do that and you'll stand out ... I sound like Steve Allen, but I don't think people are willing to do that anymore."

SEEK CONNECTION

Tesh, whose marketing company has numerous Fortune 500 clients, says it's time to stop shouting at each other over the airwaves.

"There's so much information out there right now that people really want an opportunity to connect with good information," he said. Millennials "are sick and tired of being screamed at. I think they want to be encouraged. I'm not talking about happy talk. They don't just want to be entertained."

During the decade that Tesh was an anchor on "Entertainment Tonight," he said, viewership may have been large but he never got the kind of personal response he does from regular radio listeners.

"I never had people come up and say, 'Oh my god, you're my guy.' It was more like, 'What is Phil Collins wearing?'"

Because of this personal connection fostered by radio, programmers shouldn't feel pressure to create more channels or distribution systems in order to distinguish their stations.

"You have to be able to describe yourself as something that has heart," he said. "I do a five-hour show every day and I read our social media — (listeners) are not talking about the music. They're talking about the fact that they're learning something. It's why Delilah is popular, too."

He points out that his 18-year-old daughter may text and use Facebook, but she also has a favorite radio station. "It's the simplicity of turning your radio on and listening to a host with great music."

RAMSEY JOINS THE HALL

The NAB Broadcasting Hall of Fame's newest member is Dave Ramsey, the personal money-management guru.

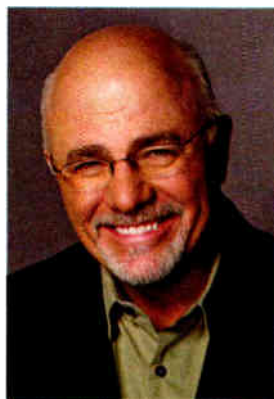
That puts him in the company of personalities like Bob Uecker, Kate Smith, Orson Welles and Dick Orkin.

"By age 26, Ramsey had established a \$4 million real estate portfolio, but lost it by age 30," according to his bio, via NAB.

"Using the wisdom he gained, Ramsey rebuilt his finances."

In 1992, Ramsey founded financial counseling company The Lampo Group Inc. Its mission statement: "Providing biblically based, common-sense education and empowerment which gives hope to everyone from the financially secure to the financially distressed." He developed it into a multi-million dollar company and nationally recognized brand.

Ramsey also created Financial Peace University, "to help people erase debt and develop sound money man-



agement habits." He says 1.5 million families have attended FPU classes, and that some 10,000 educational institutions offer its curriculums.

Writes Ramsey on his website of the debt crisis that changed his life: "After losing everything, I went on a quest to find out how money really works, how I could get control of it and how I could have confidence in handling it. I read everything I could get my hands on. I interviewed older rich people, people who made money and kept it. That quest led me to a really, really uncomfortable place: my mirror. I came to realize that my money problems, worries and shortages largely began and ended with the person in my mirror. I also realized that if I could learn to manage the character I shaved with every morning, I would win with money."

His books include "Financial Peace," "More Than Enough," "The Total Money Makeover" and "EntreLeadership." His syndicated radio show has 6 million weekly listeners and about 500 affiliates.

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Be Ready for Critical Business Shifts

Anstandig and Erdahl encourage managers to think more creatively

MANAGEMENT PREVIEW

BY PAUL RIISMANDEL

Critical shifts in business are on the minds of Daniel Anstandig, CEO of Listener Driven Radio, and Jon Erdahl, president of 3D Media Ventures. The duo will talk about such disruptive changes at a broadcast management session of the spring NAB Show.

Anstandig says he and Erdahl speak together at industry events to address the topic of “adaptive” leadership at a time when every industry seems to be undergoing being disruption. At a time when U.S. commercial radio is growing only slowly, they say, some small and mid-sized broadcast companies have achieved double-digit growth by thinking creatively.

One critical shift in the radio industry is the way the “spot economy” has changed. Erdahl says that as broadcasters, “We don’t own accounts anymore.” Or as Anstandig put it, salespeople “may identify an account as a radio spender” and chase only those accounts. “We think that’s a mistake.”

Erdahl and Anstandig believe radio has to start looking outside the confines of the traditional broadcast market to the broader media world, especially online, and towards a multi-platform approach. New, non-traditional digital revenue can in fact be had, he said, citing examples of clients who are working with major brands that sponsor interactive live programming.

THINK MORE BROADLY

Strong leaders also understand that competition is no longer just with other radio broadcasters; yet Anstandig says insularity remains an overarching challenge for radio.

Many radio companies look at other competing groups and see growth potential, so they set about to steal audience. Instead, he said, they should look outside the lines of broadcast.

“We look at the competition not just as broadcast stations, but services like Pandora, Spotify and Grooveshark — services that take time spent away from radio that aren’t necessarily tracked in ratings, that earn revenue that aren’t necessarily tracked in revenue reports.”

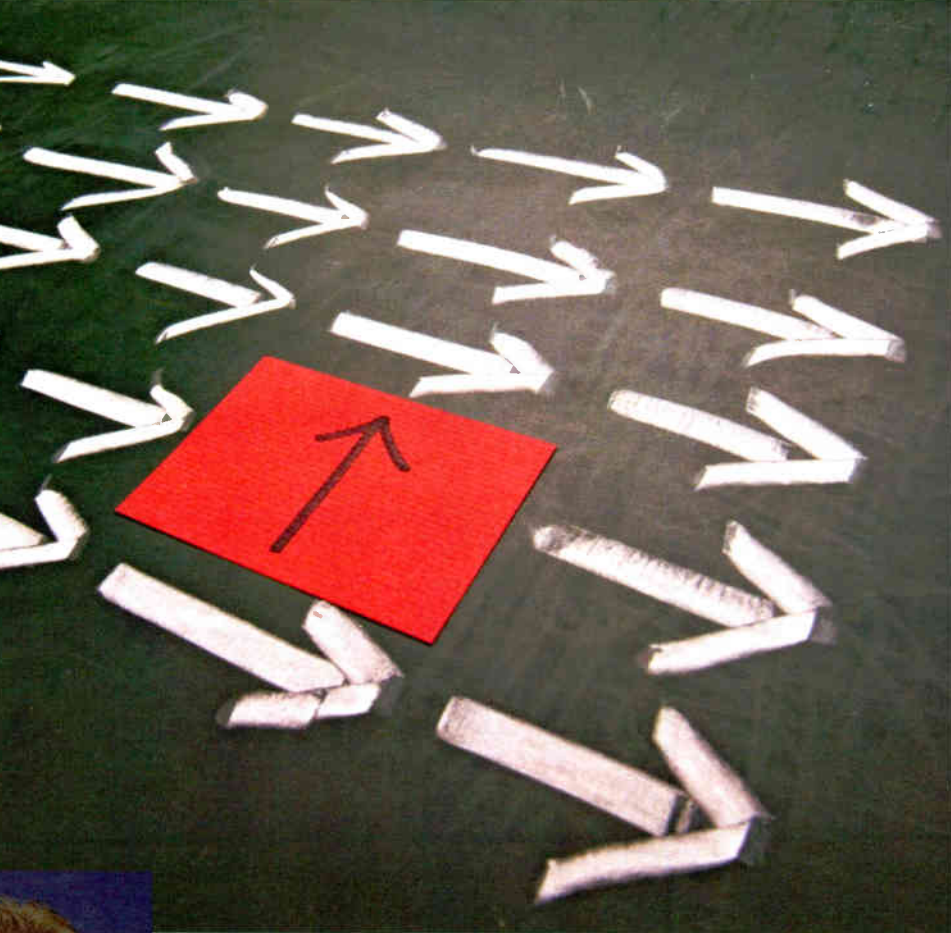
Erdahl says it’s “the guys in the garage, inventing the next thing, that we have to look out for.” CEOs are “scrambling so much as mini-CFOs,” he observes, so they’re not taking stock

of what’s going on. They only see what’s in front of them, and react, resulting in “random acts of engineering” rather than innovation.

Anstandig emphasizes the importance of managers acting like entre-

preneurs, seeing potential, moving in a problem-solving and real-time management mentality.

“There’s a big difference between knee-jerk and real-time adaptability,” he said. Programmers think they have a feedback loop with listener testing, “but there’s several weeks or months between when you talk to the audience and when you make an adaptation.” His company helps involve the audience in real time because Anstandig believes broadcasters need systems to absorb



Daniel Anstandig and Jon Erdahl

entire daypart via a mobile app and the station’s website. Listeners can vote on songs from the station’s inventory to add to the playlist, or vote to move a song up or down in position. Within a week Anstandig says the station had 2.1 million votes from 300,000 unique voters.

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ence in control of real-time music decisions,” though programmers still set the playlist that listeners choose from.

Cox Media’s 97x, WUSN (FM), in Tampa, Fla., relaunched and rebranded in January using technology provided by Listener Driven Radio, letting listeners program the

entire daypart via a mobile app and the station’s website. Listeners can vote on songs from the station’s inventory to add to the playlist, or vote to move a song up or down in position. Within a week Anstandig says the station had 2.1 million votes from 300,000 unique voters.

FRESH PERSPECTIVES

Critical shifts are happening inside stations, too. The “elephant in the room,” Erdahl says, is that broadcast-

ers need to stop recycling sales talent and recruit new. “Successful clients in mid-sized groups are going outside the norm, hiring account execs that aren’t broadcasters.”

“There are a host of recruiting sources that broadcasters aren’t even utilizing. If you have only a staff of three, then something is always going to suffer, and often that is strategy.” So, he advises, you need to find people who

are very qualified, even if that requires looking outside of the business. “Where are you going to find the new pool of talent?”

Anstandig and Erdahl work primarily with CEOs of small and mid-size broadcast companies in mid-sized markets because, they say, that’s where the innovations are happening. “By working with the CEO first, it ensures that we have a strategy for growth working with the GMs ... it has to start at the top,” Erdahl said.

He concludes that broadcasters should not simply “circle the wagons,” nor “wait for the competitor across the street.” Instead, as broadcasters, “We need to do it ourselves.”

The session “Ten Critical Business Shifts for Radio Broadcasters” takes place Tuesday April 9 at 10:30 a.m. in the Broadcast Management Conference.

Paul Riisman del is a veteran of community and college radio. He is co-founder and technology editor of RadioSurvivor.com.



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World Radio History

More for Managers

This issue of *Radio World* focuses on events at the NAB Show of interest to radio managers, including the Broadcast Management Conference; below is a sampler of more management sessions. See www.nabshow.com for a full list. Our next issue will feature technical sessions and exhibit listings.

Monday, April 8

9 a.m. — Show Opening; state of the industry address by NAB President/CEO Gordon Smith and a conversation with Chase Carey, president/COO of News Corp.

1 p.m. — "Top Radio Technologies You'll See on the Floor," moderated by Chriss Scherer of Radio magazine.



FCC Chairman Julius Genachowski and NAB President/CEO Gordon Smith share a laugh at the 2012 convention.

1 p.m. — "Radio's Alternative Revenue Is No Longer Alternative." Tips about multi-platform, cross-channel programs from alternative revenue specialists and sales managers. Moderated by Julie Koehn of WLEN Radio.



Julie Koehn



Ajit Pai

3 p.m. — FCC Commissioner Ajit V. Pai leads a session on AM radio revitalization featuring "AM radio leaders, engineers and policy experts."

Tuesday, April 9

9 a.m. — Lowell C. McAdam, chairman/CEO of Verizon Communications, talks with NAB's Gordon Smith on his vision for the future of wireless broadband, broadcasting and competition (General Session).



Lowell McAdam

10:30 a.m. — "Technology to Enhance Radio Salespeople's Productivity"

10:30 a.m. — "Radio Regulatory Revue," with Peter Doyle of the FCC and several broadcast lawyers.

Noon — Radio Luncheon: Dave Ramsey, personal money-management expert and national radio personality, will be inducted into the NAB Broadcasting Hall of Fame. Also: John Tesh speaks and Crystal Radio Awards for community service are announced.

2:30 p.m. — "The Digital Mindset: How Radio Stations Are Making Money With Digital," a discussion led by Dan Shelley of Interactive One/Radio One, and including participants from Marketron, Second Street Media and the Tesh Media Group.

Wednesday, April 10

9 a.m. — FCC Chairman Julius Genachowski Q&A and conversation with NAB Joint Board Chair Paul Karpowicz

10 a.m. — "Platforms in Motion," regarding alternative delivery systems for radio.

Noon — Lunchtime Social: An interactive discussion of social media applications for radio over lunch, hosted by Holland Cooke.

1:30 p.m. — "Peering Over the Edge," regarding what's next for radio, including "hybrid" applications such as Illustrated Radio and Service Following.

PEOPLENEWS

The Connecticut Broadcasters Association named sports broadcasting executive **Michael P. Ryan** as president. **Mike Rice**, former president, will stay on as VP during the transition.

Scott Taylor was promoted to GM of **WAWZ(FM)/Star 99-1**, licensed to Zarephath, N.J. He replaced the Rev. S. Rea Crawford, who retires.

Harman Professional named **Bryan Bradley** as VP/GM of JBL Professional's loudspeaker business unit, and tapped company veteran **Jaime Albers** as senior director of global sales operations.

The **Telos Alliance** said **Marty Sacks**, former VP of business development, becomes VP/executive director of the Axia Audio division. **Kirk Harnack**, former VP of Telos Products, becomes VP/executive director of the Telos Systems brand. **Ken Skok** was promoted to sales manager for several of its brands in the Asia/Pacific.

Nexus Broadcast added **Dustin Williams** as a technical services specialist. The company also promoted **John Gutierrez Jr.** from a consultant to VP of operations.

RF Specialty Group added **John George**, **Bob Groome**, **Tom Driggers** and **Tara Littlejohn** in sales roles. George and Groome will work in the Southeast, Driggers the



Michael P. Ryan

Northwest. Littlejohn will serve as accountant and sales assistant for the Southwestern and Southeastern regions, based in Texas.

Berlin-based dynamics processing specialist **Jünger Audio** appointed **Anthony Wilkins** as international sales manager. He will focus on the United States and United Kingdom.

Studio automation and RF systems provider **Broadcast Electronics** promoted **Don Backus** to eastern region sales manager.

Cumulus Media added **Alexis Glick** to its board. Glick is CEO of the GENYOUth Foundation and helped to launch Fox Business News.

Tom Humm, who helped in the formation and professionalization of the **Nevada Broadcasters Association**, is celebrating his 35th year as a Nevada broadcaster and will receive the 2013 NBA Lifetime Achievement Award.

Jim Farley, long-time news director for Washington's all-news **WTOP(FM)**, said he will retire at the end of 2013.

Mary Catherine Pleffner was named CFO of the **Broadcasting Board of Governors**. Also, **Jeffrey Shell**, president of **NBC Universal**, was nominated to the **BBG** to fill **Walter Isaacson's** term and serve as chairman.



Bob Groome



Alexis Glick

The **Committee for U.S. International Broadcasting**, a nongovernmental organization involved in international broadcasting, added **Michael Benjamin** as a member of its advisory board.

Armando Pérez-Roura, a six-decade journalist, will have his name placed on **Univision Radio's** Coral Gables, Fla. studios. Pérez-Roura is manager of Univision Radio's **WAQI(AM)** in Miami.

Dial Global Inc. changed its executive management structure to a more traditional one led by one CEO instead of three co-CEOs. **Spencer Brown** was named CEO; **Ken Williams** has been named its president, reporting to Brown. **David Landau**, previously the third co-CEO, resigned.

Three members left the **SiriusXM** board and three others selected by **Liberty Media** have joined after **John Malone's** company gained a majority share of the company. **Leon Black**, **Lawrence Gilberti** and **Jack Shaw**

resigned, according to a regulatory filing with the Securities and Exchange Commission. Liberty executives take their place: Senior VP **Mark Carleton**, VP of Corporate Development **Robin Pringle** and retired General Counsel **Charles Tanabe**. Interim CEO **James Meyer** also joined the board.

Cumulus Media selected **Mark O'Brien** to be market manager in Washington.

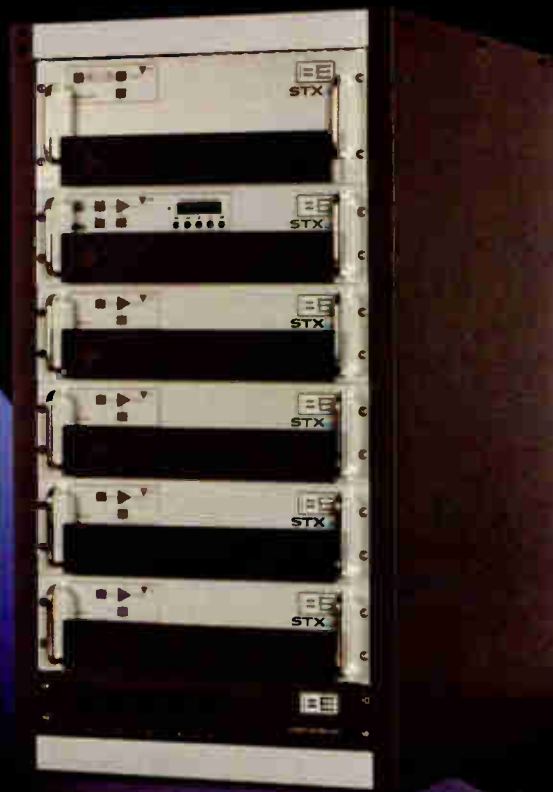
Kevin Weatherly, senior VP of programming at **CBS Radio**, signed a multiyear contract renewal to remain in his lead programming role.

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For over 50 years BE has been the industry leader in bringing groundbreaking technology to radio worldwide. Today's BE has ALL the answers, is re-energized and brings a whole new class of industry-leading technology solutions to radio stations. BE is ready to introduce you to the Next Great Low Power Transmitter and Exciter from the STX Series!



STX LP Generation II

The new STX LP series offers better performance, flexibility, reliability and value than any other transmitter in its class. This 2nd Generation STX LP now includes enhancements to provide more redundancy options and more value such as an integrated digital exciter, improved audio performance equal to the legendary FXi Series, improved AC to RF efficiency, SNMP Level 3 Control, HD and DRM+ capability, quieter fans, and a Fan Mute Option in Main/Alternate or N+1 configurations.

STXe

Providing unparalleled audio performance, the new STXe exciter will continue BE's dynamically engineered excellence. STXe exciters have a small footprint, are operational in FM, FM + HD Radio™, HD Radio only, DRM+, or HD Radio + DRM+ modes, and range in power from 100mW to 250W. The STXe exciter is now standard in BE's S and T Series FM transmitters.

STX LP



Broadcast Electronics • 4100 North 24th Street • Quincy, Illinois 62305-3606 U.S.A.
Telephone: (217) 224-9600 • E-Mail: bdcast@bdcast.com • www.bdcast.com

TX300+ Is a Peach in Georgia

LPFMer likes BW Broadcast's ease of use, features and performance

USERREPORT

BY TIM KOCHIS
Chief Engineer
WDRW(LP)

ATHENS, GEORGIA — I was looking for a reliable and easy-to-operate exciter/transmitter for my low-power FM station, WDRW(LP), that would run not just in an ideal environment but in a harsh one. Not every station has the ideal home for the transmitters, so I needed something built to last.

We have many BW Broadcast products and all have performed flawlessly over the years. I can't recommend them enough. Quality, reliability and excellent customer service make their products real contenders in the low-power

RF field.

So I took a look at the latest: the BW Broadcast TX300+.

This is part of a line of transmitters starting at 5 W and getting up to 1 kW. All transmitters have AES/EBU inputs, built-in audio processing, VSWR fault protection and a unique dual-loop virtual VFO exciter.

The audio processing, taken from BW's DSPX range, is standard. Such a feature is either a high-cost option or not an option at all in other transmitters; perfect, too, if our stand-alone audio processor decides to take a day off.



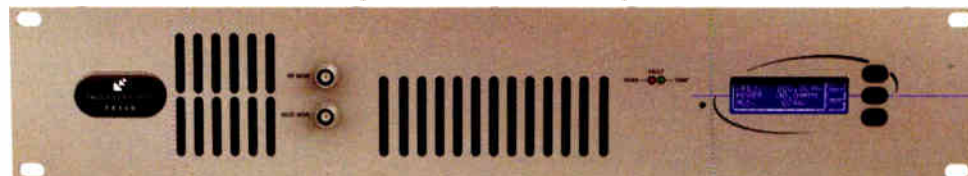
Installation was a breeze. I set up the built-in processing options, selected my frequency and TPO, racked it up and that was that — it was up and running.

The transmitter is perfect for my LPFM; reliable and solid. It sounds great and the

efficient it is.

My TX300+ was built, designed and tested in London by BW Broadcast. I purchased mine from their U.S. distributor SCMS. The TX300+ has a list price of \$2,925 and came with a two-year comprehensive warranty and 24-hour technical support. Buying from them allows me to utilize the stocked and trained U.S. service center at SCMS.

The BW products we have purchased have proven to be excellent. The multiple units I have in the field have all been subjected to different environments and have performed better than any other product in its class. The amortization



remote software allows me to control it without having to go out to the site. I really like the fact that I can set the frequency internally and therefore limit the control on the front panel to avoid any unwanted tampering. I can check the transmitter on the remote software if I need to, but I know the BW is going to give me a clean signal, and will protect itself should something happen to my antenna. I also love how energy-

cost to MTBF is excellent. At 2RU and modular in design, BW keeps it simple for the client. It works and works well.

The BW Broadcast TX300+ has proven itself to meet my needs. We have used a number of other broadcast transmitters but the TX300+ has exceeded our expectations.

For information, contact BW Broadcast at (866) 376-1612 or visit www.bwbroadcast.com.

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DaySequerra
www.daysequerra.com

TECHUPDATE

THE ETG3500 IS THE NEWEST ELENOS INDIUM

The Indium ETG3500 FM transmitter is the latest from the Elenos R&D department.

This Indium transmitter includes latest-generation LD MOS RF amplifier devices and has been built using planar technology. Power output is 3,500 W.

Features include an MPX input, mono, stereo, AES/EBU, analog remote control, OLED display, GSM telemetry, web browser control and an SNMP agent.

Three AC/DC power supplies with PFC and protection for high voltage are onboard for redundancy and to guarantee that the ETG3500 is always on-air. Six cooling fans, three on the front panel and three on the back, maintain proper operation.

Energy efficiency is 70 percent, according to Elenos.

ETG3500 installation and maintenance is quick and easy. This 4 RU transmitter can fit into a single bay and weighs 84 pounds.

For information, contact Elenos USA in Florida at (855) 353-6670 or visit www.elenos.com.





MEET AXIA'S NEW, SMALLER IP CONSOLES. THEY'RE BIG WHERE IT COUNTS.

Plastic labels? Not on these consoles. High-res OLED displays on each channel tell talent exactly what source is assigned.

Just a push on the Options knob lets board ops assign new sources, adjust gain trim, source EQ and more.

Razor-sharp OLED Program meter with overload warning, VU or PPM ballistics? The choice is yours.

Inside this 2RU chassis beats the heart of a giant, with power to run two RAQ or DESQ consoles. Or maybe one of each? It's okay, we don't judge.

QOR.16 console engine doesn't just look cool - it stays cool thanks to beefy heat-sinks and fanless design.

Can a super-duty, high-performance rotary gain control still be called a fader? Just don't call it a "pot" - that's old tech.



Avionics-grade switches with LED lighting.

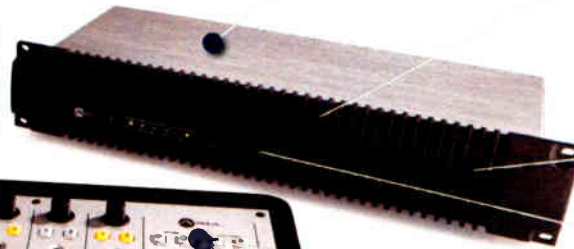
Machined-aluminum work surfaces are made tough, to stand up to what jocks dish out.

Smooth 100mm, premium faders are side-loading to foil dirt and debris.

OLED channel displays have an audio confidence meter, too.

Four-position monitor selector lets you switch between Program or External monitor feeds on the fly.

Onboard headphone control with Preview option. Cheesy outboard amps need not apply.



Built-in Ethernet switch lets you easily network devices and studios. Plenty of professional, balanced analog, AES and Livewire I/O, too.

Four Show Profiles for instant recall of console configurations. Try that on a PA mixer.

Rugged, built-in, auto-ranging power supply. No line lumps or wall-warts on Axia gear.

Event timer has manual and auto-reset options.

Time-of-day clock can slave to your NTP server.

The more you saw, the more convinced you were that IP consoles made sense for your station. Problem was, you had small spaces to work in. Some behemoth board that looks like a '78 Oldsmobile just wouldn't fit. But there was no way you'd settle for some cheap plastic PA mixer that looked like a refugee from the church basement. "Wouldn't it be great," you thought, "if someone made an IP console that didn't take up a whole room?"

Then you saw the new RAQ and DESQ consoles from Axia, and your problems were solved. With the power and features of a big console, but minus the ginormous space requirements. RAQ will drop right into those turrets in your news station's bullpen -

the reporters can send their finished stories right to the studio. And DESQ is perfect for the auxiliary production rooms.

But what sealed the deal was finding out you could run two RAQ or DESQ consoles with just one Axia QOR.16 mixing engine — you know, the one with all of the audio I/O, the power supply and the Ethernet switch built in. That brought the cost down so low that when you told your GM the price, he actually didn't swear at you (for once). Make another decision like this, and you might just be changing the sign on your door from "Chief Engineer" to "Genius."

Available in the U.S. from BGS: (352) 622-7700

Axia Audio is a member of the Telcord Alliance. © 2011

AxiaAudio.com/RAQ | AxiaAudio.com/DESQ



TECHUPDATES**PTEK GAMMA SERIES IS ENERGY EFFICIENT**

PTEK says that its Gamma Series transmitter achieves 80 percent efficiency using LDMOS-based amplifiers. This results in a low cost of ownership.

The company adds that there would also be additional cost savings from the lower heat generation of these amplifiers. Less power is lost to generated heat and thus less power is required by HVAC systems to cool the transmitter building.

The electric power savings in this new PTEK design is significant, the company adds.

In addition, PTEK says that the Gamma Series is designed to answer customer demand for a small, dependable and efficient transmitter that is economical, quick to get on air and easy to maintain. A 2.5 kW system is 4 RU (including exciter) and a 10 kW system is 36 inches high in a standard 19-inch rack, weighing 400 pounds.

For information, contact PTEK in California at (888) 889-2958 or visit us at www.ptekpower.com.

**REMANUFACTURE IS THE WORD AT BAUER**

Here's an offering from Bauer Transmitters for stations trying to find a way to 50 kW or 100 kW (ERP) economically.

For several years Bauer Transmitters has been giving its 10 kW and 25 kW FM transmitters a second life. Known as Models 610 and 625, these began their first life in the 1970s and 1980s. Over the years, some have been returned to Bauer when room had to be made for newer solid-state equipment.

When received at Bauer-El Paso, the 1 kW and 2.5 kW drivers, separate units, are removed and parted out to support lower power units still in the field. The grounded grid final and its power supply are "remanufactured," a process that includes a rebuilt tube socket, plate blocker and Centrimax blowers.

Any parts that show wear are replaced.

An Econco rebuild, the popular and dependable 3CX15000 tube is supplied. A solid-state driver and exciter chosen by the customer from several possible source is supplied, tuned, tested and ready to go at a fraction of new model price.

For information, contact Bauer Transmitters in Texas at (915) 595-1048 or visit www.bauertx.com.

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Nautel Transmitters Pull Double Duty

Tennessee broadcaster chooses Nautel boxes for main and back-up missions

USERREPORT

BY **JEFF SCHROEDER**
Contract Engineer
WLQK(FM), Stonecom

COOKEVILLE, TENN. — When I arrived at Stonecom in January 2012, they had already decided to purchase a Nautel NV10 solid-state transmitter to replace the incumbent Harris 10 kW tube transmitter at WLQK(FM).

dous value that I changed the order right there and then on the show floor.

I installed the NV10^{LT} in May easily, quickly and simply: Four wires and I was done. If I hadn't had to wait for the electrical contractor, it could easily have been on the air within 24 hours of delivery. And since going on the air, there's been no issues. It's rock-solid.

The extensive redundancy with multiple amplifiers, modules, fans and power supplies eliminates any single point of failure, giving me the confi-



I was told the decision had been based on Nautel's solid-state technology being more cost-effective and easier to service than tubes.

I'd had no experience with Nautel transmitters at that point, but heard through my peers of Nautel's top-notch reputation, so I was pretty excited to visit the Nautel booth at last year's NAB Show and check out the NV10 for myself.

I met with Nautel's Central USA Sales Manager Jeff Welton and he showed me not only the NV10 but also the brand-new NV10^{LT} transmitter, which combines the architecture and outstanding efficiency of the NS Series with the intelligent features and exceptional value of the VS Series.

Well, I was sold. For the same price as the NV10, I could get an NV10^{LT} and a VSI for backup. From our small-market standpoint the dollars made total sense, and we were getting such tremen-

dence to only check on it once a week, thus saving me time and trips to the site. The integrated direct-to-digital exciter is exceptional. The sound is so good and clean, we've had many people commenting on the marked increase in sound.

While I have not had a chance to quantify the exact power savings yet, I know they're there and I'm also looking forward to hooking up the AUI for remote accessibility via the Internet soon.

As for the back-up VSI — it's a great little box. I installed it in June easily with no issues, and it serves as a regular backup for two FMs at the same site on a single-bay antenna. It is so frequency-agile that with just a little switching, I can back up any one of my FMs. I've even used it to back up an FM at a different site.

For information, contact Nautel Sales in Nova Scotia at (902) 823-5131 or visit www.nautel.com.

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World Radio History



Channel	Value	Units	Status
1 TX-A FWD	100.0	%	Green
2 TX-A RFL	0.0	Watt	Green
3 TX-A PAV	37.5	V	Green
4 TX-A PAI	15.7	Amps	Green
5 TX-A TMP	102.2	Deg	Yellow
6 TX-B FWD	0.0	%	Green
7 TX-B RFL	0.0	Watt	Green
8 TX-B PAV	0.0	V	Green
9 TX-B PAI	0.0	Amps	Green
10 TX-B TMP	70.2	Deg	Green

Nash FM Builds With Harris

Cumulus launches country station WNSH(FM) with HD Radio plant

USERREPORT

BY DAVE SUPPLEE
Regional Engineer
Cumulus Media

NEWARK, N.J. — When WNSH(FM) went live on Jan. 21, it became the first new country music station to enter the Greater New York market in 16 years, and New York City's first new commercial radio station in about 30 years.

Cumulus Media, the nation's second largest radio group, purchased WFME, licensed to Newark, N.J., in November. The station had been a non-commercial, religious station run by Family Radio for decades.

SITES

The transaction included two transmitter sites — one main and one backup — on a West Orange, N.J., hilltop with a view across Hoboken all the way to Manhattan.

We ordered Harris HD Radio equipment for the main site including the Harris Flexiva 20 kW air-cooled HD Radio transmitter and the FlexStar family of HD Radio products (HDI-200 Importer, HDE-200 Exporter and FlexStar HDx Exciter). We also purchased an Intraplex HD STL Plus T1 studio-to-transmitter link.

The decision to buy Harris HD Radio and STL gear was made by our Senior Vice President of Corporate Engineering Gary Kline, following extensive research on the technology



at some point the FCC allows us to run a full -10 dB HD on both upper and lower sidebands, our Flexiva easily can provide the 9.7 kW output required to achieve the licensed output.

The 20 kW Flexiva is configured as a stack of two 10 kW transmitters. While each of these "power blocks" has its own controller, a third controller serves as a supervisor to coordinate operation.

On Jan. 11, we signed for the transmitter delivery at 7 a.m. and had it up and running by 3p.m. in its compact 44-rack unit high (IRU wide) housing. Upon turning on, it immediately came up to the correct TPO level. My engineering colleague Bob Klima and I continued to run it in test mode until the Jan. 21 launch.

We were impressed by how quietly Flexiva runs compared to other solid-state transmitters. And Harris' PowerSmart transmitter architecture, which uses electricity efficiently, helps us reduce operating costs.

Flexiva transmitters are based on modern technology that we are confident can scale to meet our changing needs. WNSH's future roadmap may include HD Radio multicasting of two or three advanced services. The importer and exporter are in place to multiplex HD Radio signals for transport to exciter. The importer brings in audio for secondary channels, and the exporter combines those signals with the HD-1 signal.

The Intraplex STL carries all signals over T1 circuits from our Two Penn Plaza studio location in Manhattan to our transmitter site, where the FlexStar exciter takes delivery of the multicast signals.

The Flexiva also alerts us in various ways, including by email, should anything fail at the transmitter site. One of the most convenient features is Flexiva's Web-enabled remote monitoring of virtually every operational parameter. As regional engineer for Cumulus stations in New Jersey, Pennsylvania, Ohio, Virginia and Connecticut, I find the ability to check this transmitter from remote locations to be an indispensable timesaver.

Flexiva has a front panel with LED displays and buttons that let you navigate system menus, but when I'm at the site, I prefer to plug my laptop into the transmitter's front or rear panels. Using my laptop, I can use a browser-based GUI to check system settings and in-depth diagnostics. These features, along with our positive experience with Harris' knowledgeable, responsive tech support, assure us that this HD Radio platform will serve our station well for years to come.

For information, contact Brian Clifford at the Harris Broadcast office in Ohio at (513) 459-3714, or visit www.broadcast.harris.com.

TECHUPDATE

TUGICOM DCE1000 WORKS AROUND THE WORLD

According to the manufacturer, Tugicom's DCE1000 is an FM radio transmitter designed to be the core of any FM radio station, whether 250 W or 10 kW.

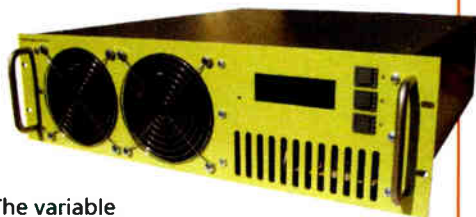
A TX190 digital exciter is built in. The variable frequency phase lock loop tuner allows for worldwide operation.

The stereo encoder uses DSP oversampling technology to ensure solid performance, low distortion, accurate channel separation and a stable pilot tone, the company says. There is an onboard full-featured RDS module. A limiter keeps the signal within its designated range.

An external MPX generator, external RDS/SCA generator or audio processor can be used via the MPX input to bypass the internal audio chain.

The Tugicom AMP1000 amplifier section, built around customized Philips NXP BLF278 MOSFETs, has temperature and SWR protections built into it.

For information, contact Tugicom in Israel at 011-972-9-861-5533 or visit www.tugicom.com.



employed by the Flexiva line, fact checking with current users, and conferences with our engineering team, including Shaun Sandoval, chief engineer for the N.Y. market.

Our Flexiva transmitter is configured for "asymmetrical sideband" HD Radio transmissions, to maximize digital power output. We operate at -14 dBc HD power on the "lower sideband" of our coverage area (maximum power allowed by the FCC) for interference protection; and we have received experimental authority to operate at -10 dBc HD power on the "upper sideband."

The FlexStar Exciter includes Harris Real-Time Adaptive Correction, or RTAC, to analyze and self-correct signal transmission. This keeps the signal within our RF spectral mask, covering North Jersey and New York's five boroughs.

While Flexiva is capable of 20 kW of transmitter power output in analog, it outputs 12 kW in full-power HD. If



Big Talker. Small Price.

Introducing the new Telos Hx6.

Winning stations know the secret to great-sounding call-ins: Telos phone systems. And with the new Hx6, everyone can afford smooth, dynamic phone segments — just like major markets have enjoyed for years. Six lines, two Telos hybrids — one certain way to extract excellent caller audio from any POTS or ISDN phone connection.

Even unruly cell phone audio gets smoothed out, thanks to adaptive Digital Dynamic EQ, caller audio sweetening from Omnia, and the most advanced DSP hybrids in broadcast. Not to mention beautiful VSet phones, with animated color displays that makes airing calls easier than ever. All at a price guaranteed to have everyone talking.

TECHUPDATES**ECRESO UPS FM WARRANTY TO 10 YEARS**

Transmitter manufacturer Eceso has announced a new 10-year warranty on its range of Helios FM transmitters.

The warranty is supplied for FM transmitters from 20 W to 2,000 W that are supported by a minimum of one year's subscription to the Expert Maintenance Reporting service.

Eceso says EMR enables time-starved broadcast engineers to keep on top of maintenance issues. It delivers reports on the status of parameters such as temperature, current and voltage as well as performance and lifespan of components such as the fan and power supply of the transmitter. With detailed logging and trend analysis, EMR can identify slow-burning problems and issue warnings in advance to allow for corrective action.

The Eceso FM range, recently certified for LPFM use by the FCC, also offers a "direct to frequency" digital modulator for clear audio quality, efficiency of up to 74 percent, management by TCP/IP and SNMP and integrated functions such as a stereo encoder, FM limiter and RDS encoder.

Helios FM transmitters equipped with a network interface feature Eceso's new Advanced Measurement Interface.

This feature offers the engineer a detailed presentation of transmitter performance with an accessible viewing panel displaying the output of onboard instrumentation that includes RF spectrum, MPX spectrum and audio spectrum analyses as well as peak meters.

The Eceso FM Transmitter line comprises power levels from 20 W to 6,000 W and is available in dual-drive, 1+1 and N+1 configurations.

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

**PROGRESSIVE CONCEPTS OFFERS LPFM PACKAGES**

Low-power FM transmitter packages from Progressive Concepts are suitable for the growing LPFM sector.



Packages are based on TX150 and TX300 Stereo FM transmitters, which include built-in audio processors and are FCC certified for use in LPFM.

The LP100 package includes TX150 transmitter, model 7050 half-wave Broadband FM Dipole Antenna and 100 feet of Belden 9913 cable with connectors installed. The LP300 package includes TX300 transmitter, MP1 Circular Polarized FM Dipole Antenna and Belden cable with connectors.

Packages include a money-back guarantee and two-year warranty.

For information, contact Progressive Concepts in Illinois at (630) 736-9822 or visit www.progressive-concepts.com.

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BEXT DEBUTS NEW FM TRANSMITTER LINE

The new XL Series from Bext consists of several new, solid-state FM transmitters.

To be shown for the first time at NAB 2013, the Bext XL 150, XL 500, XL 1000, XL 2000, XL 5000 and XL 10000 cover a range of power levels; the number in the model type reflects the power in watts.



The 150 W through 2,000 W units are housed in a compact standard enclosure that's only two rack unit high. The 5,000 W enclosure is four rack units high, while the 10,000 W transmitter occupies 12 units.

All units come with multiple connectivity options.

A 5 1/2-inch display allows direct access to settings and readings through an intuitive user menu. Units are remote-controllable with direct access via a Web page. Individual contacts for analog remote control connections are provided.

Two monitor ports are on the front panel, one for RF and the other for base-band audio.

Two USB ports are provided, one of which allows downloading or viewing the user manual and other stored technical documentation from the transmitter's front panel.

Units come with multiple LAN connections, allowing each transmitter to function as a LAN switch and control other pieces of equipment located at the same site. Main TX/spare TX duties, and N+1 configurations are supported by the built-in firmware and dedicated connections.

Bext says that it ensures audio quality across the whole line, exceeding for example 73 dB of stereo separation, 84 dB of S/N and 0.02 percent distortion. It says that efficiency is expected to average 80 percent overall, yielding low power consumption and minimal heat dissipation.

Options for the XL line include a built-in selectable stereo generator and selectable audio limiter, AES-EBU digital audio input, and programmable FSK ID keyer for auto-ID in translator applications.

For information, contact Bext in California at (888) 239-8462 or visit www.bext.com.

BE STX LP, THE NEXT GENERATION

In 2009, Broadcast Electronics introduced the STX LP 1-5 kW line of FM transmitters. BE says the new STX LP Generation II series offers better performance, flexibility, reliability and value than other transmitters in its class.

Enhancements include an integrated digital exciter with improved audio performance equal to the FXi Series, improved AC to RF efficiency, SNMP Level 3 Control, HD and DRM+ capability, quieter fans, IP connectivity and a fan mute option in main/alternate or

N+1 configurations.

At all power levels an external version of the integrated internal exciter can be added.

For 2-5 kW versions, an additional second control-

ler/PA section can be included for ultimate control, redundancy and flexibility.

BE says that the STX LP design accommodates current and future system configurations including main/alternate, FM booster and N+1 applications.

If more power is needed later, the STX LP can "scale up" with the addition of PA units and the appropriate STX LP splitter/combiner. The STX LP is available in 1 kW, 2 kW, 3 kW and 5 kW versions.

BE says that the STX LP Generation II is the first transmitter to broadcast a DRM+ signal and an analog FM signal simultaneously through a single transmitter. The company plans to demonstrate DRM+ live at the NAB Show using a DRM+ signal that is 200 kHz offset from the FM signal, showing an FM signal at 97.1 MHz and a DRM+ signal at 97.3 MHz output from a single BE transmitter.

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



TRANSRADIO HAS IPAD CONTROL

Transradio's TRAM line of AM transmitters keep up with the times. They are controllable via an iPad 2 control interface.

All transmitter functions can be supervised and monitored by the iPad-based control interface whereas safety functions of the transmitter are still implemented locally at the transmitter itself. All analog parameters are monitored by AD converters for remote monitoring and integration into the easy-to-use GUI based on iPad 2 technology.

The WPA2-secured Wi-Fi connection between transmitter and iPad 2 and the ability to remove the iPad from the front panel makes supervision simpler.

And, even if the whole computer control system would fail, basic functions of the transmitter are still controllable via local pushbuttons.

The TRAM premium LCD offers a choice among TCP/IP, BIT bus, RS-232 or dry contacts for remote control.

The focus of the Transradio TRAM premium LCD line is to offer more comfort for local and remote control while maintaining the reliability of the TRAM line transmitters.

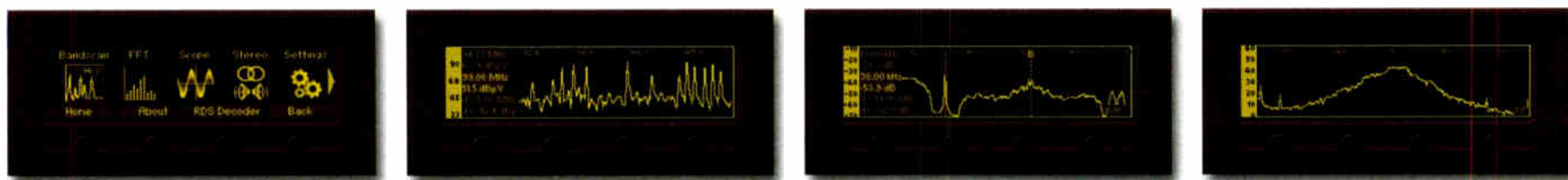
Of course, the full TRAM line power range from 5 kW to 600 kW as standalone transmitters or up to 2 MW in a combined version is available with the TRAM premium LCD option.

For information, contact Transradio SenderSysteme in Germany at 011-49-30-339-78-0 or visit www.transradio.eu.



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Available in the US from SCMS, Inc. Call: 800-438-6040

www.scmsinc.com



TECHUPDATES

CROWN BROADCAST UPDATES RFBA TRIPLE RECEIVER

In addition to AM/FM and weather band reception, the Crown Broadcast RFBA has been upgraded to monitor the public service band (144–175 MHz). The RFBA standard configuration contains three independent DSP-based tuners, each capable of tuning the AM/FM/Weather/Public Service bands.

There is no need to purchase additional tuner modules. Each tuner is also capable of RDS demodulation.

The RFBA can generate a composite output for FM translator applications, including the ability to generate customer-programmable RDS data on the composite.

Additional features include front-panel display, Web interface, programmable output relay, firmware updates via USB port and RDS encoder/decoder. Balanced



line outputs are adjustable up to 2 Vrms.

In addition to these standard features, the RFBA can be upgraded to a highly accurate modulation analyzer on all three tuners. Modulation monitor shows total deviation, positive/negative deviation, L/R/L+R/L-R audio levels, stereo modulation analysis, pilot, SCA and RDS amplitude and multipath analysis.

The RFBA was designed to handle EAS monitoring needs, provide FM translator capability and provide modulation analyzer functionality. The RFBA is packaged in a single-rack unit.

The RFBA was developed for Crown Broadcast by design partner Chrisso Technologies, which also continues technology development.

For information, contact Crown Broadcast in Indiana at (866) 262-8972 or visit www.crownbroadcast.com or chrisso.com.

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OMB HAS HIGHER-EFFICIENCY 5 KW TRANSMITTER

Transmitter maker OMB Broadcast will introduce its new, more efficient 5 kW FM transmitter concurrently with the NAB Show.



The company says that the transmitter was designed around and is made with three independent power supply units of 3 kW each, with the idea of overprovisioning this part of the amplifier and adding additional protection with internal transient or surge arrestors built into the amplifier.

The RF block is made of six 1,200 W amplifier modules, with ratings of up to 80 percent RF efficiency, according to the company.

The RF modules are fed with individual DC circuit breakers. A low-pass filter reduces the emissions to levels lower than those required by international standards, as defined by the CCIR, FCC and others.

The protection and control system are made to log, in real-time, all working events. The amplifier has analog and digital telemetry, foldback protection and fast power shutdown in case of an alarm. A variable-speed cooling system is used.

The TFT color display screen allows monitoring and control of all working parameters, like power input and power output, reflected power, the six current levels and voltage of the power supply units.

For information, contact OMB Broadcast in Florida at (305) 477-0973 or visit www.omb.com.

ABOUT BUYER'S GUIDE

Radio World publishes User Reports on products in various equipment classes throughout the year to help potential buyers understand why colleagues chose the equipment they did. A User Report is an unpaid testimonial by a user who has already purchased the gear. A Radio World Product Evaluation, by contrast, is a freelance article by a paid reviewer who typically receives a demo loaner. Do you have a story to tell? Write to bmoss@nbmedia.com.

CTE SHOWS NEW COMPACT TRANSMITTER

The TX600 600W solid-state FM transmitter from CTE Digital Broadcast is housed in a 2 RU box. The company says the compact size was realized by optimizing the RF module of the TX05, a 500 W transmitter, and by designing a new, high-efficiency power supply.

The transmitter includes the familiar controls, user interface and FM modulator platform used in the TX05.

The TX600 also offers AES/EBU input, a stereo generator, remote control via LAN port and SNMP compatibility. Control of all settings is via four buttons on the front.



Also on the front panel, a large opening with an air-filter allows pull-through ventilation for all the internal parts, thus making the equipment suitable for heavy-duty operation and ensuring reliability even at 45 degrees Celsius (approximately 110 degrees Fahrenheit) ambient temperature.

For information, contact CTE Digital Broadcast in Italy at 011-39-02-9673-8811 or visit www.cte-elit.it.

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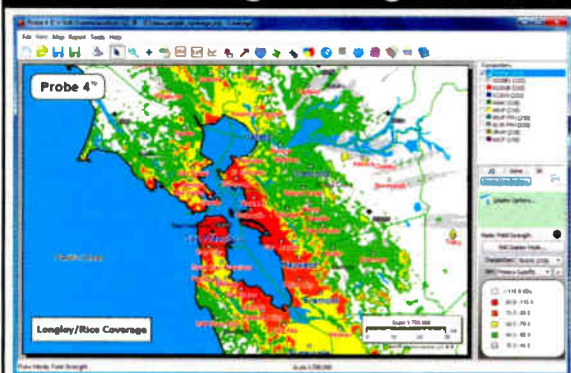


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shipping can be discussed. 443-854-0725 or ajkivi@gmail.com.

I'm looking for San Francisco radio recordings from the 1920's through the 1980's. For example newscast, talk shows, music shows, live band remotes, etc. Stations like KGO, KFRC, KSFO, KTAB, KDIA, KWBR, KSFX, KOBY, KCBS, KQW, KRE, KTIM, KYA, etc, I will pay for copies... Feel free to call me at 925-284-5428 or you can email me at ronwtamm@yahoo.com.

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

Looking for KFRC signoff radio broadcast from 1930

Andy Potter, running time is 0:22 & also the KLX kitchen the program guest is Susanne Caygill, a discussion of women's affairs with a long promotion for Caygill's appearance at a local store. Anne Truax, Susanne Caygill, running time is 13:44. Ron, 925-284-5428 or email ronwtamm@yahoo.com.

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WANT TO BUY

Wanted: old analog automation equip, filters and EQ, tube amps, reel to reel, cart machines and parts. Pacific NW area. 503-493-2983.

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RCA 77-DX's & 44-BX's, any other RCA ribbon mics, on-air lights, call after 3PM CST, 214 738-7873 or sixtiesradio@yahoo.com.

2" plastic "spot" reels 6.5 or 8" diameter, as used for quad video. Wayne, Audio Village, 760-320-0728 or audiolvlg@gte.net.

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READER'S FORUM

MEMORIES OF EARL BULLOCK

Earl Bullock passed away in January. Here, an old colleague recalls his feisty spirit and unmatched work ethic.

It was 1979 when the Schafer automation system was delivered on five pallets to the local station in Pittsfield, Mass.

The next day, this fellow with a serious Texas accent showed up and we got to work. Earl liked to work and didn't track his hours.

After spending the entire day and most of the night hauling and schlepping the racks, factory filled with reel to reels and Carousels, bolting them together and running cables, making carts with cue tones and loading tapes, adjusting 25 Hz detectors and playing with record levels, I was beat.

And I was a young man in 1979.



Earl Bullock

Well then, I'd say your station has people problems!

— Earl Bullock

"Earl are you hungry?" I said. "There's this place up the street called the Rainbow Room with outstanding lasagna, but it closes at 9 ..."

He replied, "No, thanks. I ate yesterday and I'm still good."

"Well then, I'm heading to Dunkin' Donuts for a coffee and bagel. Can I bring you back something?"

"No, thanks. Don't take too long! I want to show you some things ..."

"OK, see you in a few!"

In less than 10 minutes, I had returned.

"Where the devil have you been?" he demanded. "What in tarnation took forever?"

"Uh, well I, uh ..."

"Didn't they learn you? Didn't they teach you? Time is money!"

"Uh, well ..."

"Well nothing, mister! We got lots to do here. No time for dogging it!"

"Sorry. I just had to eat something ..."

"Okay, but time is money and don't ever forget that!"

"Okay, Earl. Are the tape dead rolls set right?"

"The dead rolls are set but we need to do a real test."

"A REAL test?"

"Yessir! We program it and let 'er rip for several hours to make sure everything functions."

"OK, but it's getting a little late and ..."

"You think it's late? It's early! It's not even midnight!"

"When do you think we'll get outta here?"

"I think we can wrap up this first phase by 3 a.m. Easy."

"If this works, what do we have left to do?"

"Two more days of work. I'm being paid for three days and I'm only on day one."

(Now, I don't mind work, and this was interesting stuff; but after 16 hours I just had to ask ...)

"Earl, how long is a day?"

"One thousand, four hundred and forty minutes," he replied.

"Geez, I never heard it stated like that."

"Well there's a slot available for each minute of the day in the Schafer, a total of 1,440."

"How do we program two things in the same minute if there's only a slot for each minute?"

"We link them together and they play in sequence."

"What happens when I push the 'STEP' button?"

"It advances to the next event. You should *never* have to push the step button unless it's an emergency."

"What happens when the tape runs out?"

"It C loops and advances to the next event."

"What happens if that tape runs out?"

"It C loops and advances to the next event."

"What happens when all the reels run out?"

"It C loops and advances to the next event and will do that until a valid event is encountered. You can monitor C loop activity right here on TP4 with a scope ..."

"What happens if there are no valid events for a while?"

"Well then. I'd say your station has people problems! And as far as I know, there are no technical solutions to political problems."

That phrase has stuck with me ever since: "There are no technical solutions to political problems."

How true.

Thanks, Earl Bullock, for all you gave to the industry and to many of us personally.

Daniel Kelleher
Chief Engineer/IT Director
WSRS(FM), WTAG(AM)
Paxton, Mass.

SOME MORE OLDIES-BUT-GOODIES FOR YOUR BATHROOM BREAKS

In response to Joe E. Lasmane's humor piece ("How About a Little Bathroom Humor," Jan. 2): Here are a few more of those GTBRs, as I call them ("Go To Bathroom Records") from before the automation days.

"Lyn' Eyes" by The Eagles, at about 6:20.

"Those Were the Days" by Mary Hopkin, at just over 5:00 (though why anyone would want to play that, except to go to the bathroom, I don't know).

And "The Wreck of the Edmund Fitzgerald," by Gordon Lightfoot, at just over 6:00.

The problem with longer songs is that they give people who don't like them a longer time to switch stations. (Just a side note.)

At one country station in Savannah, Ga., where I did overnights, music was all on discs and we made a special bathroom tape.

I would go into the production room and put together a reel (we all remember those, right?) of about 15 minutes of songs and commercial jingles.

I would update it about every two to three weeks to reflect current musical taste.

As I hit my 60th birthday (and more than 40 years in the business), some other tidbits got passed along.

Looking back, it amazes me how some Class IVs lasted as long as they did.

It was a phenomenal job by programmers, same for those that went directional and missed half the city at night, and let's not forget there were some daytimers that did very well in the AM heyday.

If you remember half-hour meter readings, six-hour live weekend air shifts and "cue burns," you have been around for a while.

Stu Wright
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WRITE TO RW

SEND A LETTER TO THE EDITOR:

Email radioworld@nbmedia.com with "Letter to the Editor" in the subject field. Please include issue date.

BURT FISHER COUNTERS

I was not surprised by the response Radio World received to my comments on ham radio (Reader's Forum, Jan. 2 issue). They were well written and I am unable to equal their prose; however, that does not make me wrong.

When you challenge hams, they will defend their privilege until their dying CQ. To borrow a phrase, "I'll give you my ham rig when you pry (or take) it from my cold, dead hands."

Some pointed out that many of the technological innovations over the past 80 years have been developed by hams. Marconi is long dead and vacuum tubes are somewhat out of style. Hams have done little for technology in the past 40 years.

Many in broadcast station operations did get a start in ham radio (me for one, in 1959). But young people are not getting into ham radio like they were 40 or 50 years ago. It is 1959 no longer. The average ham in 1960 was 28 years old. Today, the average ham is over 60.

Instead of high school ham radio clubs, we will be setting them up in nursing homes.

Hams do volunteer for emergency/public service communications, but probably by less than 1 percent. Most have no generator and few are physically fit enough to not be in the way of first responders.

G. Daniel Thomas, KBIWFF, paraphrased the Bob Dylan song in his letter to Radio World, "The Times They Are A-Changin'": "If you can't lend a hand, then get out of the way."

Most hams today are in the way.

The hams now entering the broadcast profession do not have the same background required years ago. Even if they did, they will not get the same kind of radio experience novices had 50 years ago.

I did get several emails in response to the response I received, which was published in Radio World.

These (more supportive) hams did not want to be identified, fearing retribution from the other hams that just have to be right.

Comments included:

- "I felt the need to convey support to you personally, because your message was so resonant. I sense we are similar in that we love certain aspects of the hobby (not necessarily a 'service,' except in some rare circumstances by a few), but it's not the way it used to be. I'm appalled at some of the operating practices and procedures I hear on the air these days — there has been a severe slipping of standards, training, ethics, manners, knowledge, sense of history — you name it."
- "I was cracking up reading these dissertations of 'The Value of Ham Radio' by all these CEOs!"
- "Frankly speaking, I have met several hams in the last two years who are total jerks and, of course, plug-and-play operators."
- "I totally agree with you that ham radio has gone through a lot of changes in the last 10 years!"
- "Unboxing a rig, running coax to a manufactured antenna and plugging in a mic. So what happens next? Pretty much the same thing, but with a bigger box for HF, maybe a bigger manufactured antenna. The rest is about the same. This is not preparing anyone for a job where you go out to the transmitter site and fix a bad contactor in the dog house."

My point is not that hams are bad. They are not. They are generally of good character and intelligent.



The instances of doing good are not balanced by what little redeeming qualities hams provide. If you doubt, merely listen.

Hams have contests in which they lie about signal reports (these reports would be helpful, if true); they talk about minutia; there are frequencies with profanity and vulgarity; and, rather than learn the culture of other countries where the ham does speak English, they give those hams short shrift.

This started with Dan Thomas' enthusiastic letter to the editor, singing the praises of ham radio. I responded, the multitudes responded and now I must simply QSB (fade away).

Burt Fisher
Chief Engineer
WCCT(FM)
Sandwich, Mass.

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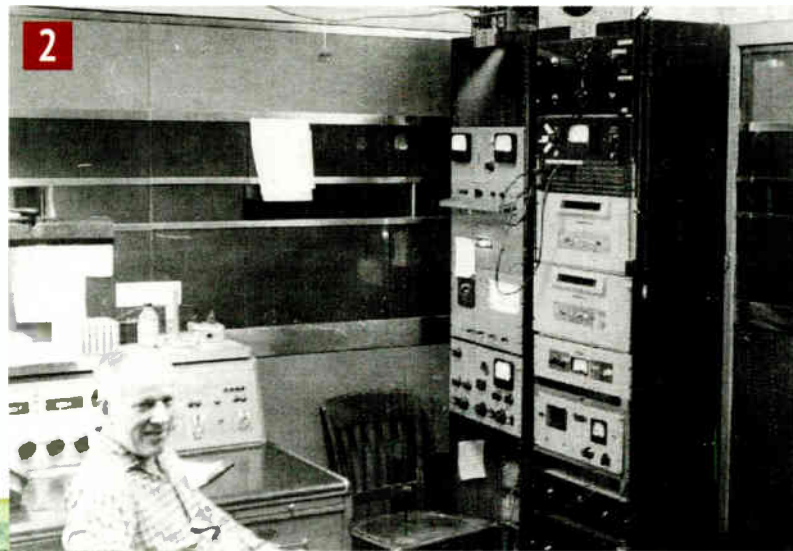
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READER'S FORUM**PICTURES WORTH
A THOUSAND WORDS**

It was great seeing John Schneider's photo of WJJD(AM) ("50 Kilowatts at WJJD," Feb. 1). I worked there from 1961-63 as summer boardman replacement and it was one of the most fun jobs I had.

The attached pictures show:

- 1) First Phone license in 1958, with Walt Myer's signature (later, Herman Gunther).



Sometime after 1963, the station moved a mile down Ballard Road and got a BTA-50H.

*John Staples, W6BM
Lawrence Livermore Laboratories
Livermore, Calif.*

- 2) The Michigan Avenue studios, abandoned in 1961, and an announcement booth built right in front of the BTA-50F.
- 3) "Patch" Swanson — W9DRM, if I remember correctly — in front of the disabled transmitter control console, now stashed in front of the phasor for the three-antenna array, and Reese Rickards at the Ampex 350, recording a news insert right in front of the transmitter.

**WJJD AND SKYWAVE**

I enjoyed John Schneider's piece concerning WJJD.

I do believe that their license was "L" for limited, rather than "D" for daytime-only, in 1947.

WJJD would operate into the evening, signing off at sundown in Salt Lake City, rather than sundown at Chicago. This gave them extensive sporadic skywave service into the eastern part of the nation. At times, they would also sign on at a pre-dawn hour, perhaps paralleling a late-night signoff at Salt Lake City by KSL.

In those days, only a few stations maintained a 24-hour schedule.

WJJD used the skywave hours, especially, to "direct sell" to listeners with such products as "Motor-Cure" and music lessons on the guitar from "Jim Major" or the piano from "Dave Minor."

The history of a few of the old timey clear channel and clear channel time-limited stations is interesting as they made their living "per inquiry" (essentially commission on the number of mail-in response-orders) during nighttime hours, while the affiliates of the "Big Four" networks made their way with daytime 15-minute, five-per-week soap operas and 2-1/2 hours of half-hour and hour big production programs in the evening hours.

*E. Harold Munn Jr.
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John Schneider replies: Thank you for your comments about WJJD and what they programmed. You are correct that the WJJD license was limited by KSL, and so they enjoyed some extra operating hours.

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1664: Just what it looks like. Two tin cups and a string. But it transmitted sound!



1876: Alexander Graham Bell's commercially viable telephone.



1900: Phones become fixtures in more well-to-do and steam-punk homes.



1920: Every home is working toward having a telephone!



1936: The advent of the dial desk phone. No more asking the operator to connect you.



1963: Push buttons usher in the thoroughly modern world. Touch tones enter pop culture.



1983: The mobile phone is a reality. Plots in all TV shows get a boost!



2004: IP Telephones begin to become the staple of modern business.



2007: Smartphones are complete communications centers. AND they can sound great!



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